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EINE—ANNEX

Electric Railway Journal

Volume XLIX

January to June, 1917

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Instructions for Use of Index

This index is essentially a subject index, not an index of titles, and articles treating a number of different subjects are indexed under each of them. In addition, a geographical reference is published wherever the article relates to any particular railway company, or to the State matters of any particular State. The geographical method of grouping serves to locate in the index any article descriptive of practices, conditions, events, etc., when the searcher knows the electric railway, city or State to which the article applies. Groupings are made under the name of the city in which the main office of the company is located, but an exception is made in the case of electrified sections of steam railroads, such entries being made direct under the name of the railroad. City or State affairs appear direct under the names of the city or State involved.

In the subject index, the alphabetical method is followed, and if there is a choice of two or three keywords the one most generally used has been selected, cross references being supplied. Below will be found a list of the more common keywords used in the index. This list has been subdivided for convenience into sixteen general subjects, but the general subject headings, shown in capital letters, do not appear in the body of the index. As an example, if a reader wished to locate an article on power-driven tower wagons he would obviously look in the list under the general subject "vehicles," and of the two keywords that appear under this caption, only "Service and tower wagons" could apply to the article in question. The reader would therefore refer to this keyword under "S" in the body of the index. Articles not covered by key word appear alphabetically.

In addition to the groups of articles covered by these headings the papers and reports from railway associations and technical societies are grouped under the names of the various organizations. Proceedings of other associations are indexed only in accordance with the subject discussed. Short descriptions of machine tools appear only under the heading "Repair Shop Equipment" and are not indexed alphabetically, because of the wide choice in most cases of the proper keyword.

CLASSIFIED LIST OF KEYWORDS

ACCIDENTS AND LEGAL

Accidents (including wrecks)
Accident claim department
Legislation
Legal
Public service and regulative commissions
Public service corporations
Safety-first movement

CARS

Car design
Cars (descriptive)
Cleaning and washing of cars
Gasoline cars
Lubrication
Heating of cars
Lighting of cars
Storage battery cars
Ventilation of cars
Work and wrecking cars

CAR EQUIPMENT

Axles
Bearings
Brakes
Controllers and wiring
Couplers
Current-collecting devices
Doors, seats and windows
Fenders and wheel guards
Gears and pinions
Headlights
Motors
Trucks, car
Wheels

EMPLOYEES

Employees
Insurance
Strikes and arbitrations
Wages

FARES

Fare collection (including apparatus)
Fares
Tickets
Transfers

FINANCIAL AND STATISTICS

Accounting
Appraisal of railway property
Financial
Franchises
Maps
Operating records and costs
Statistics
Traffic investigations

HEAVY ELECTRIC TRACTION

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High-voltage d.c. railways
Interurban railways (general)
Locomotives
Low-voltage d.c. railways
Single-phase railways

MAINTENANCE OF EQUIPMENT

Cleaning and washing of cars
Inspection of cars
Maintenance records and costs
Paints and painting
Repair shop equipment
Repair shop practice
Repair shops
Tests of equipment
Welding, special methods

OPERATION

Carhouses and storage yards
Operating records and costs
Passenger handling records
Schedules and time tables
Signals
Stopping of cars
Train operating practice

POWER

Boilers and equipment
Cables
Energy consumption
Feeders
Overhead contact system
Poles
Power distribution
Power generation
Power stations and equipment
Purchased power
Substations and equipment
Third-rail contact system
Transmission lines
Turbo-generators and equipment

RECORDS

Maintenance records and costs
Operating records and costs
Passenger handling records
Record forms

STRUCTURES

Bridges
Carhouses and storage yards
Power stations and equipment
Repair shops
Terminal stations and terminals
Waiting stations

TRACK

Pavement
Rail joints and bonds
Rails
Special work
Ties
Track construction
Track maintenance

TRAFFIC

Freight and express
Public, Relations with
Publicity
Routing of cars
Traffic investigations
Traffic stimulation

VEHICLES (not on tracks)

Motor buses
Service and tower wagons

MISCELLANEOUS

Fire protection and insurance
Lightning protection
Loading limits for cars
Manufacturing conditions
Municipal ownership
Public, Relations with
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Timber preservation

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Retrospect and Prospect

LARGER gross and net earnings, accompanied by rising taxes and other expenses; new cars purchased and built a third more than in 1915, with new track a third less; receivership and foreclosure rates about normal; companies giving signs of more intensified traffic development; public showing greater appreciation of railway operating problems and financial burdens; these facts form partly the history of 1916. A glance forward indicates that the recuperative strength shown during the past year will produce encouraging results under the more favorable conditions promised for 1917.

THE ELECTRIC RAILWAY JOURNAL IN 1916 AND 1917

Probably the most striking developments during 1916 in the electric railways of the country were of an economic character, growing directly out of the tremendous industrial revival which marked this past year. This activity brought more traffic to the railways, but greatly increased the cost of their materials and labor. Properly to report the changed conditions in the material market, this paper last April considerably enlarged its department of industrial news, now known as "Manufactures and Markets." Here have appeared interviews on trade conditions with important men in the manufacturing field, articles on prices by purchasing agents, discussions on questions of delivery and other live industrial news. Another phase of the economic development of the year, already mentioned, is that of labor, brought about by the enormous demand for help in manufacturing enterprises. This condition encouraged the activities of electric railway labor agitators, and resulted in a number of strikes, of which the most important was the September strike in New York. Here also this paper not only reported at length the negotiations between the contending parties and before the commissions, but followed up the most interesting single feature of the New York situation, the adoption of the individual contract, by describing its early history in Indianapolis and the experience with it there. From an engineering point of view, the most important development has been the continued improvement in the passenger car, especially in the direction of providing for more rapid passenger interchange. This development was signalized in the Convention Number issued on Sept. 30, 1916, and devoted to "The Development of the Modern Car." The events in the American Electric Railway Association have been reported in the Association News department which is now a feature of each issue of the paper. In this number we present our usual statistics for the year which has just passed. We also publish editorial reviews of progress in the leading branches of the industry, with a survey of its existing economic condition.

The service which we expect to give during 1917 will be even better, we hope, than that given to the industry in the past. While it is impossible in any newspaper to foretell just how each important event of the year will be handled, as the events themselves are shrouded in the future, we can say concretely that we have already arranged for one or more articles on three important topics by well-known authorities. One of these topics is the labor situation, another is public relations and publicity, and the third is the economic future of interurban railways.

ADVERTISING IN COMPANY PUBLICATIONS

An important point in the ethics of public service corporations was raised in a paper on "Railway Publicity," read recently before the Canadian Railway Club by Walter S. Thompson, press representative Grand Trunk Railway, and published in this paper last week. The author was discussing company publications, and while he spoke highly of their value in producing an *esprit de corps* among the employees, he condemned, and properly, the inclusion in such papers of advertisements of supply houses and other firms doing business with the company. We are aware that some electric railway publications carry such advertisements as well as some local advertising directed particularly to the men, but believe that where the practice of soliciting advertisements from concerns which do business only with the company is followed, it has been begun without any particular thought of the merits of the case. Nevertheless, as Mr. Thompson says, there are obvious objections to a railway seeking to gain this form of revenue from any publication which it issues.

The primary objection to the plan is that it involves the acceptance of money by the company without the giving of an equivalent. Those to whom the company publication goes and by whom it is attentively read are not potential buyers of the turbines, motors or other apparatus which are sometimes advertised in its columns or are purchasers in only very small proportion. Hence the circulation which such a publication gives to advertisements of this kind is largely wasted. Manufacturers who are large advertisers recognize this fact, but experience has shown that many of them prefer to submit to petty graft of this kind rather than to run the risk of offending the person making the request, if he occupies a responsible position on the property. This may be cowardice on the part of the manufacturer, but the blame lies primarily with the railway which makes the request directly or through one of its officers.

ADVERTISING AS A BUSINESS FORCE

Advertising ceased long ago to be an indefinite science. If it was, it would be impossible to justify the large sums of money which are spent annually by many large advertisers. The fact is that the principles underlying and controlling advertising are just as definite as those underlying and controlling the flow of electric current in a circuit of known resistance, and investments can be made and results predicated therefrom with practically the same certainty. One of the foundation principles of the expenditures thus made is that in the commercial world advertising is a business force, as necessary in the sale of goods as men, credit, transportation or money. It is not to be confused with charity, with contributions to religious, political or commercial causes or with any other service or thing. Another fundamental principle is that good advertising mediums do not "happen." They are made by service, just as the value of a public utility to a community is made by service, and by painstaking adaptation of means to ends. Mr. Thompson calls the advertising placed by supply houses in railway company publications "policy advertising," by which he undoubtedly means that the manufacturers are afraid not so to spend their money, but this is a reason which is not creditable to the railway company soliciting the business. We are glad to learn from the paper before the Canadian Railway Club that the steam railroads are coming to the view that these publications, when properly conducted, are worth to the companies the price which they cost and that support from outside advertisers can be dispensed with.

Publicity and Good Public Relations

We expressed the opinion recently that the maintenance of good public relations was the most important subject now before electric railway companies. For this reason we have devoted a considerable part of this issue to a symposium on the subject from men who have in charge the work of publicity and public relations on a number of railway properties. This symposium might be considered as a continuation of the series of editorial talks and cartoons which was concluded in our issue of Dec. 23. They discussed the general principles of publicity and the type of man required as a publicity agent. The present symposium opens with a summary by Ivy L. Lee, who dignifies this official with the title "publicity engineer." Mr. Lee tells, among other things, who the publicity engineer should be, how he should be treated by his employer, and how he should perform his functions. In the other articles in the symposium the writers show the application of the fundamental principles and tell what is being done in the way of publicity on different railway properties and how it is being done.

It is possible that there may be some electric railway managers who have the idea that publicity is being urged upon the industry as a specific for a peculiar condition. This is not so. Publicity is as broad as human activity. It is no recent discovery. Its efficacy and the wisdom of its application are unique nowhere. It pertains to electric railways no more than to all other public service corporations. It is not restricted even to corporations. It is pertinent to the prosperity and peaceful conduct of all affairs, governmental or civic, big or little, public or private, corporate or individual, with which any large element of population is concerned. It is the same everywhere and rests on the same basic foundation. Its other name is Mutual Understanding.

There are certain essentials for success with publicity. These are honesty of deed, sincerity of purpose and frankness of method on the part of those in whose behalf it is undertaken; ability and integrity on the part of him who applies it to that behalf, and ultimate fairness on the part of the people who are the jury. The third essential is present always.

There is only one point of possible difference between the publicity practice of utility corporations and that of other interests. This difference lies in the fact that the utility companies are under more critical surveillance and, in consequence, that their adherence to the canons must be absolute and unswerving. For instance, a public utility that lacks in any appreciable measure its share of the essentials mentioned above would be wise not to tamper with publicity.

Again, if any corporation possessed all the essentials it would be compromising its opportunities if it entrusted its publicity to the direction of a man whose own measure falls short of the proper standard. It is undoubtedly true that the spirit of publicity must radiate throughout the whole corporation, and it is only when the entire organization is being ruled by it and living up to it that publicity is accomplishing its maximum efforts. But the one man whose specialty this is must be as big as his work, or the work itself suffers. Then, if the cause is worthy and the manner of its presentation appropriate, publicity is sure of eventual success. It is dangerous, indeed, if misused, but if directed wisely and courageously it is a mighty and beneficent force.

It is the exception in these days to find a public service corporation which cannot stand the limelight of publicity. But it is also true that those companies which sincerely and consistently invite it still appear to be the exception. We might just as well be frank and admit that the old ideas hang on tenaciously. Many public service corporations have not yet shaken off the archaic reluctance to talk publicly and for publication. They cling to the old error of baffling silence when the public is intent to catch a whisper, of vicarious refusal to discuss topics which they regard as none of the public's business. Everything that has to do with utilities is the business of the public, because the public itself has so decreed, and the public is not going to tolerate indefinitely on the part of any corporation that policy which denies this right.

But it is not alone sufficient that a company should admit the desirability of a policy of publicity. A person might give full assent to the statement that to learn how to swim is good, but that belief alone would not help him much if he got beyond his depth in the water. So with publicity—considered in its broadest sense of making corporation matters public. Professions of willingness to treat the public fairly but without action avail little. But there is ample testimony to the fact that the right kind of publicity pays.

The Organized Safety Movement

The youth of the movement designed to mobilize interest in safety work and to stimulate further development is indicated by the fact that during 1916 the fifth annual convention of the National Safety Council and the second of the Safety First Federation of America were held. The former association started in the industrial field and has had a remarkable growth. The Federation represents especially the public safety movement. The fields of the two organizations overlap in all cases where industries and public are both involved, as they are in public utility operation and particularly electric railway operation. The electric railways are therefore interested in the work of both, and they have taken an active part in them up to the present time.

It is greatly to be regretted that the very promising movement under way during the past year in the direction of organic affiliation of the two safety societies has not yet accomplished its aim. That it will do so soon is to be expected because there is no room in this field for competition or duplication. The accident hazards connected with daily life are increasing so rapidly that every effort must be made to control them. The two organizations have no doubt had great influence so far. United this influence will be far more potent.

The electric railways have rallied to the support of the National Safety Council during the past year and at the Detroit convention, held in October, the electric railway section was conspicuous. The membership in this section is now large enough to make it an important medium of co-operation. It is only as the railways use the section in this way that it can perform its natural and proper function. The council has little to give to the railways but the machinery for co-operation, and if it does not produce the desired results it will be because its function is not understood. The principal work of last year was to get the railways together. Now they must utilize the opportunity thus afforded.

The Safety Federation is so new that the electric railways have hardly as yet had an opportunity to utilize it. However, it does furnish a medium through which municipal and other officials can work with the transportation men in making the streets more useful and safer. It has an active electric railway committee.

Electric railways are perforce in the safety movement as are few if any other industries. In the first place, they are obliged to entrust the inherently dangerous operation of electric cars to a very uncertain class of labor. The increase in the number of motor vehicles, the recklessness of drivers and pedestrians, and the severity with which courts of justice administer the law of negligence, all combine to render car operation difficult and expensive. Again, as far as employees are concerned, the railway incurs many risks incident to manufacturing, while as a power producer and distributor it has safety problems like those of the electrical power industry. It is appropriate, therefore, that the railways, through the national safety organizations and through their own associations, should push the safety movement. That they are doing so is indicated by the amount of space which has been required in the ELECTRIC RAILWAY JOURNAL during the past year to record the new things which are being done. While the Hudson & Manhattan Railroad and the Union Traction Company of Indiana occupied the limelight through the respective awards to them of the Travelers' and the Brady safety medals, many other roads have made very creditable records.

Among the tangible evidences of safety efforts in the railway field there are two classes of exhibits. One consists of warning signs and bulletins, which are now found everywhere. These are good so far as they go, but better are the safeguards actually placed around danger spots. In the shop we find belting and gearing inclosed with frames and screens, floors kept clear of debris, goggles provided for use in eye-jeopardizing operations, etc. In the power plant the switchboard is made foolproof as far as possible, stairways are used in place of ladders, walkways over boilers and piping are provided, and in some cases even railings are installed to protect window washers.

There is, of course, some danger that safety work may become a fad; that talk will be considered a substitute for deeds and that workmen will not take seriously the efforts made in their behalf. However, we are convinced that the movement is meeting a real need, that if followed sanely it will produce good results and that the results of recent progress can be conserved and applied through concerted effort.

The Year in Heavy Electric Traction

Insofar as new installations in the electrification of steam railroads are concerned, the year 1916 has been somewhat barren of results. In Europe, it is true, there has been the adoption of single-phase electric power for the Swiss Federal Railways and the electrification with high-tension direct current on a freight line of the North Eastern Railway in England, as well as a rather "dinky" suburban line out of Manchester. On this continent we have had only the placing in service of the third engine division of the epoch-making Chicago, Milwaukee & St. Paul installation over the Rockies, the interest in which, however, has been largely discounted by the great extent of the work that was done on this project in 1915.

The year, nevertheless, has been exceptionally productive in the way of operating experience. On the two spectacular installations of 1915—the Norfolk & Western and the Chicago, Milwaukee & St. Paul electrifications—the results have been extraordinary in their success. This has been due, obviously, to the fact that both lines undertook, for the first time in the history of electrification, to handle freight on a large scale. The dominant feature of both has been the displacement of somewhat more than three steam locomotives by each electric machine. In both cases train loads have been increased very materially, and train speeds have been practically doubled.

Here we have, at last, something definite upon which to base conclusions as to the future of electric operation of trunk line railroads, and every conclusion that can be drawn points to a great extension of electrified track within the near future. At the present time a great number of projects and rumors of projects are in evidence, and it is unquestionably the fact that much of the electrification work now being considered as a possibility has been due directly to the records made available during the past year.

Of the definite new projects the two most ambitious are that of the New York Central, including the west-side tracks in New York City, and that of the Illinois Central, including its lake front terminal in Chicago. Neither one offers anything in route mileage that approaches the Milwaukee's electrification across the Rockies, but at that both will be remarkable for the density of the traffic that will have to be handled. In addition it is practically a foregone conclusion that the New York Central's electrification, which will involve handling all the road's heavy freight trains over some thirty miles of the main line, will end in the extension of the electric zone to Albany, about 100 miles farther north. On this division the traffic is so dense and so continuous that it is actually feasible to use 1200-volt current. At present trains of great length are being handled by steam in remarkable time, the entire division being on the flat grade of the Hudson River, and this serves to cut down the margin between the effectiveness of steam and electric motive power. Nevertheless, there is a good possibility of the service being electrified solely on the grounds of operating economy.

Other than this, the projects now in the air are generally those which involve heavy grades, where the electric locomotive has the special advantages of unlimited power and superior tractive efficiency, both tending toward the establishment on the mountain divisions of train loads that are equal to the tonnages handled on level divisions as well as to the maintenance of reasonably high train speeds. On mountain divisions also the element of regenerative braking affords another advantage to the electric locomotive, the year's experience having shown that this method of handling trains is thoroughly practical from an operating standpoint, although as yet no basis is available for estimating the extent to which it increases maintenance costs.

In conclusion it may, perhaps, be said that the past year has been one of watchful waiting in electrification. The outlook for 1917 is more than promising as regards new projects, mainly for the reason that many doubts on the ability of electric traction to produce results have been set at rest through the record of definite accomplishment.

How Earnings Have Held Up

Just as in periods of panic or depression one finds in electric railway and other utility earnings a marked stability, so in the days of rapidly expanding prosperity one does not expect to find utility earnings so inflated as those of many other companies, particularly industrials. For this reason, the unparalleled earnings records that were made by many manufacturers in the United States during 1916 had no counterpart in the electric railway industry during this period, although appreciable advances appear to have been made in the latter field. Electric railways as a whole are still far from being inclined toward prompt co-operation in the matter of furnishing earnings statistics, but from figures thus far obtained by the information bureau of the American Electric Railway Association it may be possible to give some indication of the trend of their earnings.

For the fiscal year ended June 30, 1916, as compared to the similar preceding period, the operating revenues for about 8700 miles of line out of approximately 30,000 miles showed an increase in gross operating revenues of 3.47 per cent, in operating expenses 2.40 per cent, and in net operating revenues 5.15 per cent. During the first six months of the calendar year 1916, as compared to 1915, this showing seemed much improved, for companies operating about 7450 miles of line increased their gross operating revenues 8.08 per cent, and their net operating revenues 12.10 per cent, operating expenses rising 5.68 per cent. To bring the record as far as possible up to date, the results for the first nine months of 1916 indicate that the gross operating revenues for about 7400 miles of line rose 6.26 per cent, the operating expenses 5.13 per cent, and the net operating revenues 8.06 per cent.

Comparisons between the foregoing figures must naturally be somewhat elastic on account of the diverse mileage involved, but it seems to be assured that the earnings for 1916 will show up much better than those in 1915—probably to the extent of 7 per cent in gross and 9 per cent in net. During the year the Eastern and the Southern districts in the main continued to report improvement, and in the last reported quarter, July-September, an encouraging gain was also noticeable in the Western district, where the jitney competition on the Coast and the peculiarly persistent business depression in the Northwest had been such disturbing factors. With such general improvement the showing for the whole of 1916 would probably have followed closely that for the first half if it had not been for the losses incurred in the third quarter in connection with the New York strikes. According to the public service commission reports, the operating revenues of the metropolitan surface lines concerned fell off 50 per cent in September, 1916, as compared to September, 1915, while the operating expenses decreased only 30 per cent. These decreases had a considerable effect upon the general totals for the third quarter, and without doubt account for most if not all of the poorer results for the first nine months of 1916 than for the first half of the year.

While general increases in gross and net were thus secured in 1916, this result is not ground for unlimited optimism, for it was obtained only after a most strenuous struggle with the rising costs of labor and materials, as indicated by the above stated increases in operating expenses. That was not all, however, for the gain in net operating revenues was accompanied by added tax burdens to the extent of 3.04 per cent for 7700 miles of line in the last fiscal year, 6.58 per cent for 6400 miles in the first half of 1916 and 7.05 per cent for 6400 miles in the first three quarters of 1916. For neither of these groups is there much hope of immediate betterment. Such relief in labor costs is not possible, and while some materials whose high cost has been based largely on war usage will relapse sharply with peace, the general high prices of materials will probably not soon be forced down to the pre-war levels. Nor does it appear that there is any widely growing recognition of the fallacy of lessening the effectiveness of transportation systems to make them tax gatherers or any more serious study of the proper incidence of taxation.

Because of these facts, although the possibilities arising from the settlement of the European war present no terrors to electric railways and other utilities as compared to industrials, the future could well be much brighter for electric railway earnings. The point of the whole matter is that the companies cannot long continue to meet rising expenses with a practically fixed income; many of them are seriously pinched now. A greater traffic development will help some lines, particularly interurbans, but for the industry as a whole, in the absence of a cataclysm that would sweep away high operating costs, the fare unit must be increased or some fare system adopted that will give more adequate recompense for the service rendered. In the last three calendar years forty-nine electric railways secured fare increases of various sorts, but this is only a drop in the bucket. Many more increases are needed, and the sooner electric railway officials try in concert to show the fallacy of a sacrosanct 5-cent fare, the better it will be for the industry.

Converging Aims in Car Design

The close of the year 1916 is a particularly fitting time for consideration of the immediate goal toward which recent developments in electric railway surface cars are leading the industry. During the year certain definite ideas seem to have become common to practically all who are interested in the design of cars for city service, and although the revolutionary changes that began some four years ago are still going on, there is no question but that sentiment has reached a well-defined state of crystallization in regard to a number of features of marked importance. This, we believe, can only mean that the first step is being taken toward standard city cars—something which practically every one favors in the abstract, but which as a concrete matter is opposed because of supposititious difficulties of establishment. Insofar as interurban cars are concerned, there is no doubt that many of the same factors apply, but it is in the case of the city car that they are most strongly emphasized, thus making the latter the better basis for consideration.

During the past year the record of new construction for city service, confirming the indications exhibited in 1915, has shown very definitely that the open car is dead. With it has gone the fully-convertible car, leaving for future general types only the closed car and the semi-convertible car, which differ from each other merely in trifling detail. The year has seen, also, a practical settlement of the question of all-steel versus semi-steel construction, since the rapid growth in popularity of steel side posts and carlines demonstrates beyond a doubt that the use of wood, except for floor and roof sheathing, will very shortly disappear altogether.

With regard to less general or more detailed features of the car body, the record of the past year has shown that the arched roof is thoroughly established, because the original opposition to it on the ground of ventilation has been finally dissipated, the largest company that retains the monitor deck having actually adopted the plan of closing up the deck sash and installing half a dozen automatic ventilators in their place. The use of interior bulkheads is also very much on the wane, in view of the rising popularity of the fully-inclosed, pay-within car, which in addition has produced a tendency toward uniformity in platform design for end-entrance cars, including door width and radius of crownpieces. A practical standardization has already taken place in regard to the use of a transverse seating arrangement with longitudinal seats at the doors, and at the same time has come the adoption of a seat spacing (coinciding in all recent cars with the distance between side posts) that now falls, without exception, within a range of less than 2 per cent from the mean.

Here, indeed, are the elements of a standard car, provided the two questions of general dimensions and door arrangement could be settled. Of these the latter appears to be most formidable, because the center-door principle has received another lease of life through the new front-and-center-door designs, and in case these fulfill their present promise, they will constitute formidable and permanent rivals of the end-entrance design. It seems, in fact, impossible to consider the standardization of door arrangement at the present time. This does not, however, stand in the way of establishing a standard end-entrance car which, regardless of any reasonable growth of the modified center-door idea, could undoubtedly be used for many years to come, nor does it even stand in the way of the demand for "this year's model," mentioned by W. H. Heulings in his recent able article on standard cars. "This year's model" does not have to be a freak. In fact, experience has shown that radical changes in design are never acceptable to the electric railway industry, and that the novelties which go to make up a new model are invariably subordinate in character.

ARE STANDARD DIMENSIONS POSSIBLE?

If, then, the question of door arrangement may be left aside to be settled by future years of experience, there remains no very serious obstacle to standardization of car bodies, at least from the user's standpoint. As we have mentioned in previous issues, an overall length of 45 ft. might be arbitrarily adopted as standard for double-truck city cars without being more than 5 per cent away from the dimension now used in practically any one of the important cities in this country. Expressed in terms of capacity, this means four seats, and it would require considerable hardihood, even for supporters of the "local conditions" theory, to argue that such a small change could make a vital difference in operating results.

In the same way a width of 8 ft. 4 in. would be suitable for practically every large city, and, to go a step further, as Mr. Heulings has done in his article, a width of 8 ft. 2 in. would be suitable, with rare exceptions, for any community, large or small. For a city where an 8-ft. 6-in. width is permitted, the suggestion of using a narrower car doubtless would not be welcomed, yet it is safe to say that the great majority of city railways whose clearance lines permit such ample widths are not, to-day, making the most of their opportunities. Thirty-five-inch seats with, say, a 25-in. aisle give about all the space that any city car really needs, and these dimensions may be attained with an overall width of 8 ft. 2 in. When greater overall widths have been provided, it is quite the rule to find no wider seats or aisles than those just mentioned—the extra space in nine cases out of ten is wasted in unduly wide side walls which, instead of being confined to the easily attainable dimension of 1 in. in thickness, frequently run up to 3 in. or even more for no explicable reason.

In the case of the double-truck car, therefore, the question of standard overall dimensions is no longer a serious matter. Nor is it any more serious in the case of the single-truck car, which has a definite place in small cities where travel is light. For such equipments a length of 33 ft. has become so nearly a universal rule that it would already constitute a standard except for the incomprehensible and unnecessary variations of a few inches over or under that appear in recent cars. This, of course, excludes consideration of the one-man car whose length may be very much less than 33 ft., but here is, of necessity, a novel and little-understood type of equipment that cannot well be included, at least for the present, in any discussion of standardization. It is, as a matter of fact, a distinctly separate development that gives every indication of running its own course absolutely without regard to the older types of design.

NEXT STEP TOWARD STANDARDIZATION

From the user's standpoint, then, it has now become possible to establish a standard car by arbitrarily assigning average overall dimensions and by following the most commonly-used designs for vestibules, roof contour and seat spacing. This, it would seem, is all that the user is really interested in, since the details of construction are primarily the affair of the manufacturer, and are not likely to be improved upon by those who are operators rather than builders of equipment. Indeed, we believe that much of the existing chaos in car design has been due to the interference of railway maintenance departments with construction details—something that might far better be left to the specialists in construction. Even so, there is sufficient divergence in the ideas of the many different builders of car bodies to offer a wide choice in structural details to the purchaser of a car that had standard overall dimensions and standard general features. What the purchaser wants is a car of minimum weight and price, and of maximum durability, and a distraction of his attention to such petty complications as variations of a few inches in length, or differences in roof contour, or the relative advantages of continuous or independent side-posts and carlines can only obscure the final object.

Granting this, as well as the possibility of bringing a respectable number of railways to use a standard car, it seems to us that the next step should be a definite estimate as to the actual, tangible advantages accruing to the user through standardization. If the gain is found to be of considerable importance, there is little doubt but that the industry could be induced to indicate general dimensions and outlines which would be acceptable as standard at least for a large number of companies, but which, of course, would not have to be used by all. For the ensuing year, therefore, we would commend this question of economy effected through the use of a standard design to the car builders. From no other source could any kind of an answer be obtained, and without an answer it might well be that the present ripe opportunity for establishing a standard car would be lost altogether.

Keeping Track Costs Down

In the way departments of electric railways, the year 1916 will be remembered as one marked by a great scarcity of labor and consequent high wages, delayed deliveries and almost prohibitive prices of materials. As a result much necessary track work was postponed until conditions will have adjusted themselves. In many cities the authorized work could not be completed because sufficient labor could not be had, and in others material deliveries were responsible for incompleted programs. To counteract this labor situation much attention was directed toward increasing efficiency in the handling of materials. Many engineers turned to power tools to speed up their work. Pavement rooters in several instances supplanted the pick in the hands of a laborer. Steam shovels, dump cars and auto trucks were substituted for hand shoveling and teams. Derrick cars were quite generally used for handling the heavier track materials, and concrete mixing plants of various kinds and capacities greatly reduced the forces necessary to place this material in the track. Pneumatic tamping outfits, drills and spike drivers—all had a prominent place in track work, and each played an important part in supplanting labor.

Despite the critical situation that existed in 1916, the end does not yet appear in sight. Rail prices were advanced $10 per ton during the year and prices for special work and other steel products were also increased in the same or greater proportion. In fact, abnormal advances in prices were recorded all along the line, and indications are that further advances will be made. How much more the electric railway companies can stand and continue construction and rehabilitation programs is problematical. It is true that earnings showed substantial gains, but these were needed to make up for the losses of past years. On the other hand, the period of retrenchment on many properties had been prolonged until renewals and reconstruction were absolutely necessary. Hence, it was not surprising to find that this class of track work rather than that for extensions predominated.

SPECIAL WORK AND BETTER CONSTRUCTION

In the special-work specifications which were submitted in final form by the 1916 way committee and adopted as standard by the American Electric Railway Engineering Association, a valuable contribution to the industry was completed. Special-work manufacturers co-operated in the preparation of these, and they are anxious that the specifications should be used generally because they insure a common bidding basis. Undoubtedly these specifications will be amended to meet new conditions as they arise, but in their present form they are as complete and satisfactory as most thorough consideration could make them. In connection with special-work purchases during the past year it is interesting to find that machined-bearing insert settings and flange bearings were very generally specified, and all manufacturers are now prepared to supply this demand. We feel that our efforts in this direction were largely responsible for this change and are not only gratified but sure that it will be of great benefit to the industry.

Another development has been the general drifting toward higher standards of track construction. There was a marked increase in the mileage of track laid on concrete foundations. Where natural drainage conditions were good this change was not so marked, but elsewhere the increased bearing to be had with concrete track foundations insured greater permanence to track line and surface. Moreover, the advantages of the principle adopted by the Board of Supervising Engineers Chicago Traction at the beginning of the extensive track rehabilitation program in that city have been accepted by many other companies, and a track substructure on which rails could be renewed has been growing in favor. In an industry such as the electric railway, where the margin of profit is small, permanence in the physical property is vitally important. Undoubtedly the findings of the comprehensive study of rail corrugation made in Chicago to determine the relative merits of concrete and ballasted track in this respect will influence other companies to adopt concrete track foundations in their future programs. In this study it was shown that rail corrugation was as prevalent on one type as the other and that the phenomenon was not a respector of age or conditions.

RAIL HEADS AND RAIL CORRUGATION

Incident to the rail corrugation problem and more closely related to the rate of rail wear has been the introduction of curved head rails. Chicago's study of rail wear pointed to the advantage of a change from the ordinarily used flat-head rail to a curved head. The curved-head rail has been used successfully in England for a number of years and a few years' experience with it in this country indicates that by its use the rate of wear on wheels and rails will be greatly retarded. During the coming year the way committee will consider the question of designing a curved-head grooved-girder rail section. To facilitate this work and insure perfect harmony the equipment committee has been asked to co-operate in so far as such a head will affect the wheel tread and flange. It appears that the curve of the rail head should conform to that of an average worn wheel. The problem before these committees is to determine whether the average contour of worn wheels is sufficiently close on all properties to permit the adoption of a standard rail head section, or whether this section must be prescribed for each company. It appears reasonable to expect that where different rail sections and wheel contours are used the form of wear will vary. In some rail purchases a 20-in. curvature has been specified, while in others a 12-in. radius curve was used. Inclined curved head rails are limited to the grooved-girder sections, but this has not prevented the users of plain girder and standard-section rails from taking advantage of the full-line-of-contact principle. The first tilted or "cocked" rail track was built in Cleveland, Ohio, in 1915. Considerable of this type of construction has been added in the past year, as several other companies purchased steel ties designed to hold the rails in this tilted position and built track of this type. The cocked ties incline the rail so that its head conforms to the slope of the wheel tread and thus provides a full line of contact. In connection with rail tendencies it is also interesting to note the increasing popularity of the 7-in. sections as a substitute for the 6-in. and 9-in. rail in both the plain and grooved-girder sections.

Rail corrugation, as usual, received its share of attention during the year. Several old causative theories were exploded and new ones advanced. It was pretty clearly brought out that curved head rails are not a cure but do postpone the appearance of rail corrugation. A microscopic analysis of the mechanical properties of corrugated rail conducted by H. M. Sayers, revealed nothing new in the way of a remedy. Perhaps the vibration theory is still held by the largest number of people, but the remedies based upon this theory, where they have been used, have failed to cure the disease. According to this theory, ballasted track should offer a cure, yet the study in Chicago revealed corrugations on both types. It may be, of course, that the ballasted track was not sufficiently flexible to eliminate corrugation, but it is hard to see how greater flexibility could be introduced in track in paved streets without introducing greater complications. It has been repeatedly shown that rigid track construction is absolutely necessary to permanent line and surface—both vital requisites to minimum pavement maintenance. Where pavement maintenance costs are practically the same as track maintenance costs, it ill becomes any engineer to change his type of construction so as to increase the cost of the former. In other words, until a remedy is found which is less damaging than the disease, it appears advisable to follow the practice of the past and remove rail corrugations by grinding.

THE JOINT PROBLEM

Welded, riveted and drive-fit or high-elastic-limit bolted joints are being almost exclusively used by the progressive companies for their track in paved streets. It is useless to argue that the old-style mechanical joint will "stay put." The bolt and joint fit clearances are too great to provide absolute security, and the substitution of the drive-fit, high-elastic-limit bolt is a logical change and will unquestionably obviate many of the difficulties of the past. The electric welder and the thermit weld have brought the welded joint within the reach of all companies, and the ease of repairing isolated joint failures commends them. Both of these processes are not limited to use at the joints but have permitted the introduction of innumerable economies in making repairs to steel of all kinds in electric railway operation. The cast-welded joint and the Lorain type electric-welded joint are equally efficient with the other types of welded joints, but one requires an expensive plant and the other may only be bought under contract for the installation of a large number of joints. Finally, it is folly to use the same type of joint in expensive track in paved streets as in open construction, simply because they are uneconomical. For a time during the past year the prohibitive war prices of spelter and thermit greatly curtailed the use of the Nichols and thermit joints, but this situation has practically readjusted itself.

COST ANALYSIS ACCOUNTS NECESSARY

Whether track materials and labor are being purchased at war prices or not, it behooves electric railway engineers to analyze all their costs in order to introduce economies. It has been particularly evident during the year just past that more and more attention is being directed to unit costs. Most of those published, however, were construction costs. While it is important to keep down construction costs, it is of more importance, to our mind, to minimize maintenance costs. The efficiency of various types of track and materials can only be determined by a comparative analysis of maintenance costs. Whether this be done on one property or as between different properties is unessential so long as an analysis is made. It is but natural that engineers should delight in construction and dislike maintenance, but it is the latter phase of their work where the real savings may be made for their companies. It is only through maintenance experience and analysis that economical improvements can be made in construction. Whether the interest and depreciation on expensive track more than offset the higher maintenance of cheaper construction is a question all way engineers must be prepared to answer in the course of the next few years.

THE problems of electric railways are the problems of the communities served, and in increasing measure as these problems become more complex it is essential that the community vision be clarified if the interests of both parties are to be properly served.—JAMES H. MCGRAW.

Equipment of the Power Plant

In reviewing power plant progress it is convenient to consider separately the boiler room and turbine room of the steam plant, with their respective auxiliaries, and other general matters which relate to steam and other plants as a whole. This year we shall confine attention to the steam plant, although this does not imply that progress has not been made in water power, gas power, and oil power plants as well. For the electric railway operator, however, it seems that the most significant progress has been made in the steam plant.

THE BOILER PLANT IS IMPROVING

There is no doubt that after a long period of comparative neglect the boiler room is now getting its proper share of attention. This is in part due to the demand for higher pressure caused by steam turbine development and also to the objectionable bulk of the boiler compared with the turbine for which it furnishes steam. In partial explanation of the slowness of boiler improvement it may be said that the opportunity, and hence the incentive, for saving was less here than in the engine room. At present, further reduction in steam consumption in the turbine depends largely upon the ability of the boiler to produce higher pressure. At the recent A. S. M. E. meeting in New York a speaker claimed for a certain boiler plant, not in electric railway service, a sustained efficiency of 90 per cent. In view of the numerous although individually small sources of loss a performance like this cannot be expected under ordinary circumstances. The present excessive cost of steam coal, however, should stimulate boiler operators to get along with a minimum quantity of this precious mineral and to provide ample storage facilities in future.

In going to higher boiler pressures there is evidence that the makers are prepared to furnish what is demanded. There are practical limitations, however, set by first cost and maintenance cost, heat losses and leakage, as well as hesitation in departing from standard practice. An example of a high-pressure plant is one installed this year by the Public Service Company of Northern Illinois in which the pressure is 350 lb. per square inch and the superheat 225 deg., Fahr. It is to be expected that pressures will be increased gradually as design and construction are perfected. The standard boiler code of the A. S. M. E., adopted last year, will no doubt exert its influence in steering design along conservative lines.

Aside from the matter of pressure, there is no doubt a tendency also toward improvement in increasing heating surface. With one notable exception, in the main plant of the Detroit Edison Company, the popular size of boiler has contained 6000 sq. ft. of heating surface or less, producing roughly 600 (so-called) boiler horsepower or less. There is no reason for not going to larger sizes excepting the natural desire for standardization, but this cannot, of course, be controlling. At any rate, the demand henceforth is going to be for more heating surface per unit. The amount of steam which can be produced on this surface is determined almost entirely by the furnace.

THE FURNACE IS A SEPARATE PROPOSITION

In the line of furnaces there is a steady demand for all three general types of stoker, the underfeed for use with forced draft, the inclined overfeed for natural draft and the chain grate. In spite of the more spectacular results obtained with the first-named type, which is eminently adapted for peak load work, natural draft is still relied upon in many plants. The use of oil in furnaces has not been forgotten either, but in general this fuel cannot compete with coal on a cost basis. Although oil as a fuel is attractive from the standpoint of convenience and cleanliness, these advantages are becoming less important each year as the apparatus for handling coal and ashes is perfected. In a modern plant the labor element in the boiler room cost has become entirely reasonable.

It is to be regretted that little progress has as yet been made in popularizing a substitute for the unit known as the boiler horsepower. All engineers recognize the inconsistency of the present practice, particularly as output depends to so great an extent upon the furnace, but they seem not to be able to get together in the matter. The good work should be kept up, however, in the interest of consistency. Electric railway engineers can exert considerable influence to this end.

WHERE WILL THE TURBINE STOP?

At the moment the situation in the metal market is affecting deliveries of steam turbines, but great progress is being made in the turbine room as well as the boiler room. The most remarkable thing is the scale upon which large turbines are being purchased, speaking in general terms of the past year or so. Remodelings like that of the Virginia Railway & Power Company's plant, described in a recent issue of this paper, are going on everywhere. That the power plant is able to stand the expense involved in the development period of a new prime mover like the steam turbine and at the same time produce its output at less cost is highly creditable to the engineer.

There seems to be no limit to the size of the turbine, large or small. In large units there are some under construction to produce outputs of 70,000 kw. in three cylinders, and a single-flow turbine recently ordered will deliver 45,000 kw. from a single cylinder and generator. In small units the turbine is increasingly appreciated for driving auxiliaries, as it is compact and rugged. As its exhaust is used for feed water heating the water rate is not a prime consideration. Geared turbines, particularly for direct-current generator drive, are also being called for more and more. The types of turbines now in use between the extremes in size mentioned comprise tandem-compound turbines with one generator and cross-compound with two generators. The three-cylinder turbines referred to, designed for the Interborough Rapid Transit Company, are of the two-stage type and drive three generators each.

THE CONDENSER IS MAKING NOTABLE PROGRESS

Condensers have been improved to keep pace with the turbines which they serve, as is evidenced by the fact that surface condensers of as high as 56,000 sq. ft. condensing surface are being built and a jet condenser for a 45,000 kw. turbine is on order. The preference is for surface condensers, but the business in jet condensers continues to be good. Barometric condensers are being constantly improved. In surface condensers the problem is to produce straight line flow of steam to eliminate friction loss.

In auxiliaries the steam turbine furnishes a popular drive for circulating and air pumps, although the reciprocating vacuum pump and slow-speed circulating pump are still preferred in some cases. A so-called "heat balance condenser" has also been developed in which the pump load on a jet condenser is divided between a turbine and an electric motor. This permits the turbine to furnish just the amount of steam required for heating the feed water.

A NEW APPLICATION OF THE PHASE CONVERTER

The electrical end of the turbo-generator unit has, of course, been improved with the steam end. This has been accomplished through refinement in design. Temperature rise, allowable and actual, has had even more than usual attention, and an effort has been made to interest users in keeping track of internal temperature rises through the use of suitable instruments. Power plant operators concerned with the furnishing of single-phase power particularly for railways have been much interested in the application of the phase balancer or phase converter by the Philadelphia Electric Company, which supplies power for the Philadelphia-Paoli electrification. This apparatus applies the principle of the revolving field somewhat as was done in the phase converter used on the Norfolk & Western locomotives, where single-phase power is drawn from the line and is converted to three-phase for the motors. By an ingenious adaptation this principle has been applied in a machine which can be placed away from the power plant on the three-phase line and will automatically transfer load from a heavily loaded phase to the others.

It would be unfair to an important movement to close this brief review without a reference to the commendable zeal of power plant operators in safeguarding dangerous machines, circuits and other sources of possible accident. New plants are being designed with this element conspicuously in mind and the older plants are being brought up to date rapidly, as is explained more in detail in another editorial.

Protecting the Overhead System

In the power distribution field the work of the year has been in the way of an intensive study of existing apparatus and methods with view to increasing the reliability and safety of service and to securing economy in operation rather than the development of new apparatus and radically different systems of distribution. As reflected by published articles and the work of technical society committees, state commissions and federal bureaus, the leading thought of the year seems to have been protection. The term "protection" as here used covers two categories; protection of service and protection of employees and others from the hazards incident to the rendering of that service.

INCREASING RELIABILITY OF TRANSMISSION LINES

The increased attention on the part of the railway companies to the matter of power sales work, the large energy supplies required for industrial purposes, and the heavier railway traffic all have tended to increase the demand for a service which shall be without interruption. It is not surprising, therefore, that at the present time engineers are giving much time and thought to minimizing the number of interruptions of service and the time per interruption. Devices, such as arc suppressors, electrolytic lightning arresters, current-limiting reactances, isolating transformers, better insulators and motor emergency trucks, which assist in accomplishing these ends are gaining rapidly in favor. As illustrative of what may be accomplished by paying careful attention to the matter of lightning protection may be cited the experience of the Commonwealth Edison Company, as described by D. W. Roper in papers presented at the annual conventions of the American Institute of Electrical Engineers and the National Electric Light Association. This company, by the use of improved methods of protection, has been able to eliminate 90 per cent of the troubles caused by lightning. Along the same line may be noted the experience of the Beaver Valley Traction Company, described in the ELECTRIC RAILWAY JOURNAL, Jan. 8, 1916, page 89. By the use of carefully wired electrolytic arresters on their cars this company has been able to reduce its motor trouble caused by lightning to an almost negligible amount.

So important is the matter of good transmission line insulation from the standpoint of continuity of service that there is a feeling, in some quarters at least, that it is better engineering either to weed out defective insulators or to reinsulate a line than to provide a duplicate line. Tests for detecting faulty insulators on both dead and live lines have been more fully developed during the year, and, while still not infallible, a large percentage of the bad insulators on a line may be located by their use. Methods for replacing defective insulators on high-voltage lines with the line in service have also been developed.

THE PROBLEM OF INTERCONNECTING TRANSMISSION LINES

The interconnection of the transmission systems of electric railway and power companies seems to be a growing practice and one that is highly commendable.

If properly carried out it prevents absolute shutdown, reduces the amount of reserve equipment necessary and promotes economy in operation. Broadly considered, a transmission system is a transportation system just as much as is a railway system. In the early days each railway formed a separate little unit and the present interconnection of systems has been a gradual development. Such connections, however, have so facilitated transportation that their severance would be, as we look at it now, little less than a national calamity. It seems reasonable that the facilities for the transportation of electrical energy should be just as flexible and as well interconnected as are the facilities, say, for the transportation of coal. The problem of interconnection is one, therefore, that we feel should receive in the future even more attention than is now being bestowed upon it. The interconnected system of railway and power companies centering at East St. Louis, described in the ELECTRIC RAILWAY JOURNAL, Jan. 22, 1916, page 156, is a good example of what might be done with profit by many companies in other sections of the country.

The second phase of protective work, namely, the minimization of life hazards, has received an unusual amount of attention this year. Not only have individual companies been paying particular attention to their safety work, but the labors of the Bureau of Standards in connection with the National Electrical Safety Code have tended particularly to emphasize this phase of protective work. Objections to the code have been well aired before technical societies and in the engineering press, and, therefore, will not be reviewed here. Whatever its faults are as a code, however, it cannot but be admitted that it has had considerable educational value and that the many joint meetings held over the country for the purpose of discussing its various features have tended to develop a get-together spirit which should hasten the general standardization of many of the minor details of line construction.

THE WORK OF THE ENGINEERING ASSOCIATION

The American Electric Railway Engineering Association committee on power distribution faced a large number of problem assignments when it began its year's work; too many one would think on first sight. Nevertheless, the committee's record is one of much valuable work accomplished. The consideration of standards of other societies relative to overhead work with the view of weeding out inconsistencies, the review and revision of the existing association standards on the subject and the work on joint committees were among the important features of the year's work. An exceptionally well prepared technical discussion of the theory of concrete poles was contained in the committee report, as was also a rather exhaustive study of the various third rail constructions now in use. A number of new sections were added to the recommended specifications for overhead line material and information relative to high voltage direct current and catenary trolley construction preparatory to the formulation of standard specifications for such constructions was gathered. The formulation of the specifications is one of the important tasks set for the succeeding committee.

DEVELOPMENT WORK IN POWER TRANSMISSION

The study of the effect of altitude on apparatus ratings and the use of the grounded neutral constituted the bulk of the work of the American Institute of Electrical Engineers committee on transmission and distribution. No attempt was made by the committee to determine an altitude correction factor, but a consensus of the opinions gathered from operating engineers seemed to indicate that altitude should be given some consideration at least in loading apparatus of standard ratings. The question of the grounded neutral versus the ungrounded one is largely a matter of protection of service and apparatus. As one might expect, what would be best for one system might not be best for another, but as a result of its work the committee seemed to feel that the grounded neutral offered most advantages when the line voltage was above 60,000.

THE RETURN CIRCUIT

The work of several national joint committees, commented on in our review of last year, has been continued, although as far as reports are concerned the committees have been marking time pending final action on the National Electrical Safety Code. It is expected that the report of the national joint committee on electrolysis will be published shortly. As its work will represent the combined efforts of a number of associations represented by eminent engineers, this report will constitute a high authority on the subject. The notable series of electrolysis investigations by the Bureau of Standards have been continued and several valuable technical papers bearing on the subject have been published. Among other things, the investigations of the bureau have shown that corrosion is practically negligible where the cycles of current reversal are shorter than one minute. The conclusion is that, in the so-called neutral zones of railway networks, where the currents in underground structures are continually reversing, the damage chargeable to electrolysis is less than would be expected from a consideration of the arithmetical average of the current discharged to earth from the structure. The three-wire system as a means of electrolysis mitigation is being installed at Springfield, Mass., under the directions of the Bureau of Standards experts. Such a system has been in service on 125 miles of track in Los Angeles for nearly two years. The experience there seems to be that under favorable conditions, where there is a sufficient number of feeders, such a system costs les sand has lower losses than the better known insulated return feeder system.

The problem of maintaining the return circuit is very closely related to that of electrolysis. The elimination of electrolysis and poor bonding are certainly incompatible, and the problem of bond maintenance seems to be largely that of joint maintenance. In city service welded joints are being used more than ever before. The same may be said of the welded type of bond, and it is of interest to note that several of the new bond welding devices are of such nature as to permit the work of bonding to go ahead without interrupting service.

ELECTRIC RAILWAYS ARE CONSIDERING SUBSTITUTES FOR COPPER

The high cost of copper and aluminum in this country during the past year has focussed the attention of American engineers on the conducting problem. Considerable information relative to the electrical characteristics of iron and steel wire and cables has been published and, where climatic conditions are not adverse, there seems to be a growing tendency to use such conducting materials on lightly loaded distributing circuits. The use of specially-spiralled cables for railway feeders has been suggested, and in this connection it has been pointed out that the higher inductance of the magnetic conducting material would increase the protection of substation apparatus. While this is true as far as substation apparatus is concerned, experience with third-rail systems would seem to indicate that, upon the interruption of a short circuit or other heavy current, the discharge of the energy stored in the magnetic field in the feeder itself and the surrounding air would increase the duty imposed upon the control and motor equipment of the cars. As illustrative of the greater possibilities in the use of iron or steel may be mentioned the return circuit construction used on the recently electrified section of the Lancashire & Yorkshire Railway, where a fourth rail is used for the return circuit.

A Complex Year for the Manufacturers

The manufacturer of electric railway supplies during 1916 experienced conditions that may safely be defined as chaotic. Material and labor conditions have never been more complex than they were last year, but out of the complication has come a stronger group of manufacturers, more willing and more able to serve the electric railway industry.

To summarize the problems which have confronted the manufacturers during the past year is difficult, because conditions have changed so rapidly. For instance, a year ago that manufacturer whose income was largely derived from sales to electric railways found himself in very serious circumstances. For three or four years the roads had not been buying in substantial quantities, each year the buying was growing less and the cost of manufacturing and selling was increasing. In the face of rising costs and a diminishing market, the year 1916 bid fair to be a lean year. Until late spring there was little prospect for sustenance on the part of those whose bread and butter came largely from sales to electric railways. Then the roads in the eastern industrial districts began to buy. Later on traffic increases for the roads in the Central States prompted buying activity there. Then the rush began.

Having deferred purchases so long because of lack of money and because of high prices, the electric railways, when they did begin to buy, really needed prompt deliveries. Most of the buying was to meet deferred maintenance. But other industries had begun to buy earlier, and the material and labor situations were so tense that the electric railways had to wait their turn. And in most instances it was a long wait. Only within the last few weeks have manufacturers been able safely to make promises of deliveries.

PRODUCTION CONDITIONS STILL UNSATISFACTORY

Production conditions are now far from what the manufacturers would wish, but they are on the mend. The larger concerns have finally established sources of supply for most raw materials so that delivery of finished product is now more nearly determined by the speed of factory production. Of course there will always be special jobs offered, which, if accepted, would interrupt factory procedure. But this year the manufacturer, backed up by good orders for his standard products, is in a strong position to turn down orders for special material and special designs. It has required great courage at times to make decisions which would clear the involved manufacturing situation. Sales effort has had to be curtailed and good salesmen diverted from their regular work to go scouting for raw materials and for labor to man the shops. But now the lines of supply of materials have become better established, and production is going forward at a rate probably never before approached by the manufacturers in the electrical industry.

In setting down the reasons which caused and sustained the highly involved manufacturing conditions of 1916, lack of labor should be put first, and lack of raw material second. Capital for carrying on the work was not lacking, and the freight problem was a natural sequel to the labor and material shortage.

Consider the labor situation first. All the industries of the country are busy, and raw material producers are sold so far ahead that they have little concern about next year's market conditions. They need men. Nearly 500,000 men are engaged in munition supply work. And, in consequence of labor shortage and high living costs, wages for day labor have exceeded all previous limits.

The steel and textile industries, two of the greatest employers of labor, have granted a 10 per cent increase in wages for the third time since Jan. 1, 1916. Wage advances in many lines of manufacturing have been more than 50 per cent. Yet, notwithstanding the abnormally high wages paid, it has been practically impossible for manufacturers to hire all the men needed during the past seven or eight months. The reason for this has largely been the competition for labor among the manufacturers. This is particularly true with regard to the high grade skilled employees and the low grade common laborers, the two extremes. And the natural consequence of this shortage of labor has been one of lower efficiency in the manufacturing operations. Men by the thousands, who two years ago had never seen the inside of a large machine shop, are now employed at machine work and drawing the pay of first-class machinists. Many a "skilled mechanic" of to-day never served an apprenticeship. Labor never cost so much and earned so little.

The material problem of the manufacturer can probably best be expressed to the railway reader by the statement that during the last year so far as embarrassment from slow delivery of material has been concerned, the manufacturer has suffered more than the railway. Most manufacturers at the beginning of 1916 had on hand some surplus stocks, supplies or extra parts ready for manufacturing their products. Many had built up reserve stocks during the lean years. They were thus able to sell to the roads and protect them against emergencies. In contrast, however, the manufacturer found his avenues for buying even more restricted. The producers had little surplus stock on which to draw and were inclined to listen only to the big buyers.

Manufacturers have put enormous pressure on the producers of raw materials and have gone to the extra expense of having materials expressed into their factories in order to be in position to accelerate deliveries of finished products to the railways. Raw materials must be paid for now at top-notch prices, and these conditions have existed for several months.

THE METAL MARKET IS STILL UNSETTLED

In the manufacture of electric railway materials copper plays a most important part, and the dearth of this material and its steadily rising price has been a bugaboo for many manufacturers. Since 1908 copper had ranged from 11 to 22 cents, until 1916 when it began its phenomenal climb. At the opening of the year 1916, the New York carload price for Lake copper was 20 cents per pound, and an epoch in the history of copper prices developed on Nov. 20, when for the first time all deliveries up to one year were quoted at 30 cents per pound or more. Bulk copper was then 34 cents. It should be remembered that the prices for lead, tin and zinc have followed the same general trend as those of copper, but toward the end of the year these materials were not quite so strong as was copper.

The copper question, so far as the manufacturer in the electric railway industry is concerned, is a delicate one. Should he stock up with copper at 35 to 40 cents per pound and use this to manufacture his devices for sale two or three months hence? Or should he buy just sufficient copper to fill existing orders and take chances on the future? In either case he is speculating—in one case with materials and in the other case with his prestige with his customers. There still exists a wide divergence of opinion as to the future trend of copper prices. Thus the manufacturer must busy himself with matching prices and widely fluctuating material costs in an endeavor to obtain for himself a margin of profit. From the railroad standpoint, of course, purchasing of copper and copper products at present prices means a largely increased permanent investment, on which there is a possibility of considerable drop. Hence the restraint in buying except for maintenance requirements.

What has been said about copper also applies very closely to the conditions in the steel and iron market, and uncertainty regarding steel prices and deliveries has caused the manufacturer no end of worry during 1916. The girder-rail manufacturers early in the year gave their old customers opportunity to buy their regular requirements. Having done this, the manufacturers felt themselves free to contract for all their other capacity. Electric railways purchased less girder rail in 1916 than for many years previous, except 1915. Even at these increased prices there is little prospect of very much girder rail being available for purchasers during 1917.

BUYING IRREGULAR BUT MARKET CONDITIONS BETTER

Notwithstanding the present orders in hand and in prospect, market conditions in the electric railway industry are not as satisfactory as the manufacturers might desire. The general buying is extremely irregular. This no doubt is due to the fact that the field has largely ceased to expand. Comparatively little new street or interurban line has been built in the last five years. The average additional trackage growth per state is less than 15 miles per year, and that means that buying for the industry is based largely on maintenance and renewal requirements.

In turn, of course, this has benefited those manufacturers who are interested in other fields and yet are strongly entrenched in this one. It means that they are not now subject to the hazardous competition of earlier years. Then, when things were going fast, there was a market which stimulated competition by the very reason of its activity. New devices, new tools and new labor and money-saving methods were promoted in large numbers. But of late the field has not offered the inspiration for new things that it did in earlier years. Consequently most manufacturers have built up interests in allied fields of industry, and their problems have become those of production and sale of recognized products, rather than of design and development. This is tending toward standardization, and if the roads will adopt standards and buy accordingly, the saving to them will no doubt offset the loss due to the lack of the former highly competitive selling stimulus.

The manufacturers of cars, motors, trucks, rails and other large elements of an electric railway would extend every co-operation to any group or association that would standardize its requirements. Much has already been said on this subject. The manufacturers have always been ready to act, but even though associations have "adopted" standards, the railroads don't accept them for purchase. Standardization is a manufacturer's problem which the roads have a primary interest in solving at once.

The possibilities for next year's business are now a live topic. Prospects seem very bright just now for a busy year. Slack buying for four years, increasing traffic and much equipment that has outlived its natural life, would seem to warrant the prediction that the electric roads during 1917 will require more new materials and supplies than they have bought during several years past.

Developing Traffic

A new order of things presents itself in practically every phase of the electric railway industry as compared with practices, opportunities, restrictions, liabilities and public sentiment prevalent ten, five, and even two years ago. In the character of traffic and the possibilities of its development, especially, has there been noticeable change. For instance, the interurban service which we now assume as a potent factor of the whole transportation scheme of the nation has been almost wholly a unique factor in the field of electric common carriers. They had to create a field for themselves and carry people who previously did not travel. Now, however, this pioneer work is largely completed, use of the electric railways has become habitual, and there is not great room for expansion in this class of transportation, future growth of passenger travel being largely dependent on population growth. Yet this approach to saturation is what was expected in the original estimates as the means of profitable return to the investors, and the reason that the railways are now in hard straits is because the greatly increased operating costs were not anticipated.

Herein, then, lies the incentive and the necessity to go beyond the plans of the original promoters and include in the business of the electric lines, transportation which will offset the grossly enlarged operating costs, bring the lucrative return which was expected and is on the majority of roads impossible from the passenger business alone, and present a field where real endeavor may show big increases in total traffic and net profit.

As the various railways recognize this necessity to broaden the scope of their business, the immediate possibility for expansion in the transportation of freight is obvious. One prominent official even goes so far as to say that there is no electric line which accepts freight that does not have more traffic offered to it than it can possibly handle. We have repeatedly pointed out during several years past that the possibilities for important revenue from freight service were great, that the physical inadequacies were the principal limitations and that this was the answer to the question of future growth.

Hence, it is with interest that we see each year a few more properties engaging in this business. Thus, during the past year, to mention a few: the Terre Haute, Indianapolis & Eastern Traction Company; the Chicago, Lake Shore & South Bend Railway; the Cleveland, Southwestern & Columbus Railway, the Scioto Valley Traction Company and the Chicago, North Shore & Milwaukee Railroad, among others, have begun physical preparations for entering into the freight business in a large way. The Illinois Traction System, the Detroit United Railway, the Michigan Railway, the Pacific Electric Railway and others, already well established in this class of traffic, are making extensive additions to their facilities for handling carload and less-than-carload freight, including terminal facilities costing amounts approaching millions on individual properties. And so the dawn of another day in the traction field is bright.

MEANS TO ENCOURAGE CAR LOAD FREIGHT

Ways and means to create freight traffic, once it is begun, are numerous, but much depends on the personal element in the straight solicitation of business, for much educational work is still necessary to show the shippers that the electric line really has advantages to offer. Hence, the solicitation must be tactful and convincing. Then the matter of service—fast, frequent, reliable schedules—is the foremost requisite for development of any class of traffic, and too much emphasis cannot be given to this consideration. Terminal facilities with arrangement and capacity for releasing teams and trucks with minimum delay are important business getters, for a merchant or manufacturer would much rather send his freight over a line that will get his team or truck away from the terminal without standing in line two or three hours than to use any line where he must make this expensive sacrifice. For every four trucks or teams that have to stand in idleness for two hours a day regularly, he must add another unit to his haulage equipment, with the added labor, upkeep and overhead it entails. This is a big item that the shipper sees and feels, and the road that can save him time and money here has a big advantage in attracting his patronage.

The carload freight traffic is coupled very closely in its possibilities with the interchange arrangements with other lines. Some difficulty is experienced in securing these traffic agreements with the steam lines, but this is gradually being overcome and must soon give way before the importance the electric lines can assume as tributaries to the flow of freight on the long haul lines. Following these arrangements, industries must be developed on the electric lines. Grain elevators are one of the common adjuncts in this connection. One merchant who was induced to build three elevators on a mid-western line has also put in large stocks of lumber, building material and coal at these points. The advantage of this combination is very significant. It not only permits all-year business for both the merchant and the railway, but makes it possible for the latter to handle cars under load both ways.

It is possible to develop some remunerative carload traffic by encouraging the installation of side tracks for lumber and coal yards at points adjacent to thickly settled communities. Connection with sand pits, cinder pits, stone quarries, etc., for distribution of their products, and unloading these materials at points close to the work under way with a charge for the actual cost of this unloading, will encourage preferential movements over electric lines. Attention to the hauling of brick, paving blocks and sand and cement for paving roads and city streets, especially where solicitation can include the ability to deliver close to the spot they are to be used, will create a goodly traffic in the course of a year. Keeping closely in touch with contemplated public and private improvements in towns along the line and co-operating with the concerns selling the materials necessary for this work will bring good returns. In fact, it is possible to make the railway traffic department a sort of information bureau for people located along the line, to direct as to the best place to secure almost all kinds of commodities. This is profitable when it stimulates shipments of carload lots or even steady shipments of less than carload quantities.

In many localities within 100 miles of our numerous sugar factories, beet culture is a profitable industry for the railways and the farmers. Beet dumps or receiving stations may be secured at the expense of the sugar company where, within a radius of 3 or 4 miles, farmers have 500 acres of beets, raise beets averaging 14 tons to the acre and haul them to the receiving station. At these stations the sugar company takes the beets, furnishes scales for weighing and pays the freight to the sugar factory.

POSSIBILITIES IN LESS-THAN-CARLOAD FREIGHT

In the development of the less-than-carload and package freight traffic, the growth is more than ever dependent on "better service" and will increase almost in proportion to the class of service maintained. Some electric railways are making a practice of accepting shipments up to fifteen minutes before scheduled departure of trains, and by use of the Manibill system, make four copies of the waybills at once and place the destination station in a position to effect delivery in a few minutes after the arrival of trains. A liberal policy in discharging freight at points along the line where there are no depots is also a business producer for the distributor and a time saver for the receiver, and it makes friends for the company. These and other efforts at highest service are effective in competing with the motor truck, which is now offering keen competition for the short haul package freight. It is advisable in some cases to utilize motor trucks as feeders for the railway and to make street address deliveries in restricted areas where competition is particularly keen.

Working in conjunction with Chambers of Commerce and civic organizations for the development of truck farms and dairies, arranging convenient schedules for movement of these supplies to market, and co-operating to create a market, will often bring a very profitable return in traffic, though opposition from the commission men is often encountered. Another plan is direct co-operation with creameries and merchants along the line. One creamery company on a western road has for next year a plan of loaning money at a nominal rate of interest to any farmer who will invest it in milch cows, a plan which has great possibilities. In the handling of milk, of course, good results have been obtained by providing special milk trains.

Another very important field of traffic in which the rapid service of the electric line may be made an important inducement is in handling perishable freight. Meat, berries and other high class shipments, which otherwise move under ice, may be handled without icing by virtue of prompt service, thus saving the expense of icing to the shipper and to the road.

Then there is the carrying of freight on passenger cars, or "traction express" as it is often misnamed, an important item in the sum total business on the interurban line. Advantage is not taken of this plan by a great many roads, which seems rather surprising, for we are familiar with the income which has been realized from this source on several roads with practically no additional expense to handle the business and little solicitation to get it. It is a real service to the small town merchant to be able to telephone in early in the morning to his wholesale house 20 or 30 miles away and give his order for merchandise to be placed on the "8 o'clock car" and receive it at 9 o'clock.

FREIGHT FRANCHISES OF BENEFIT TO PUBLIC

Of course, many of the possibilities for expansion of the interurban freight service depend on the attitude of the municipalities through which the lines pass. Unfortunately there has been a short-sighted prejudice thrown around the handling of freight through the city streets, but this limitation is gradually lifting. The electric lines could bring about a large saving in the cost to the consumer of bringing produce, dairy products, etc., into the cities and moving building materials and freight generally, over the city streets to their point of local distribution or ultimate consumption. This movement could be made at night when the aesthetic sense of the citizens need be little disturbed, in tight, clean cars which would be much less obnoxious in every sense than the garbage and other filthy loads which are now hauled through our streets in the day time in leaky, unsightly wagons. Then, too, the matter of street congestion is assuming constantly greater importance, yet the most efficient means of transportation is used scarcely at all during one-fourth of the time. We are glad to note, however, that there is evidence here and there of a change in public sentiment as communities realize the savings and advantages secured by the movement of electric freight through the streets. And with the present high living cost, the savings in particular take on added public interest. Hence, this may be the opportune year for electric railways to press their case for freight franchise rights through the streets. Certainly no more commendable effort from the viewpoint of service to the community or profit to the company, could be made.

The Technique of Publicity

By Ivy L. Lee

FRANKNESS *in Dealing with the Public Through the Newspapers, Faith in Its Fairness if Facts Are Presented Simply and Truthfully, as Well as Methods for Securing Publicity Are Advocated in This Article.*

PUBLICITY in the running of public service corporations is as important in its way as motive power itself. Electric railway managers have not had time to think about publicity. They are busy men. Their whole aim has been to please both the public and investors.

Years ago street railway managers were busy running their cars with horses and mules. That was a big problem in its time, and it was just as hard then—if not indeed harder—to satisfy both the public and investors. Then came a new and vital adjunct to the running of street railways—electricity. Railway managers had not thought much about its use to them. It came as something from the outside, but it came with a universal demand for its use.

The railway managers could not ignore this new force. First they employed experts to assist in adapting this new power to their service; then they made a careful study of it themselves. True, they were very busy, but this new thing was too important to leave to subordinates. Upon its successful use depended the whole future of the business.

Running railway properties to-day without taking the public into one's confidence, without using every legitimate means of publicity, is about as obsolete as operating street railways with horses and mules. Through publicity the railway manager of to-day brings to his aid those vital forces which come from support of the public. Without these, indeed, the business itself cannot live.

TAKING THE PUBLIC INTO ONE'S CONFIDENCE

Why is this thing, "Publicity," so important? It is so intangible and the direct value of it is so difficult to appraise that the practical mind is prone to regard it as an evanescent product of an age of newspaper hysterics, and not as a supremely vital and substantial force in business management. But even the most unimaginative business man has come to realize the power of public opinion. The public not only has power, but it has come to know that it has it. Public service corporations are beset on every side by laws and regulations. These, indeed, are very real things demanded by a democracy which refuses to be denied.

I am one of those who believe that the American people are fair; and that when they really understand the facts, they will see to it that justice is done. They have no objections to success as such, no matter how large, if only it is honestly and fairly attained. If this is correct, and if the railway manager feels that the ultimate success of his business hangs upon the fairness and justness of law and regulation, must we not see to it that the public which is back of law and regulation knows all the facts so that its judgments may be sound and constructive?

NOT ALL THE FAULT IS WITH THE POLITICIANS

One so often hears it said that politicians are at the bottom of all our troubles; that if they would only stop their meddling all would be well. Those who make such a statement mistake the effect for the cause. The demogogery of politicians is not solely responsible for the troubles of public service corporations. The misunderstandings of the public, due generally to lack of information on the facts or full information on a bad state of things, have led to an attitude of mind exceedingly open to the influence of the politician.

IVY L. LEE

When public service corporations are run with primary regard for their public obligations, and when they have made the public know that this is true, the politicians will be prompt to trim their sails to other winds.

"Yes," you may say, "this is all very well, but let's get down to a practical basis. How does this all apply to the daily life of my company? What can I do to avail myself of this new power that in modern days, you say, is just as important as electricity itself in the conduct of my business?"

THE WRONG WAY OF DEALING WITH NEWSPAPERS

The most important medium through which to deal with the public is the press. Newspapers are more delicately adjusted to sense the feeling of the people than any other institution. H. G. Wells says that the newspapers are the windows through which we look at the world. The street railroad man must, therefore, take the newspapers into his confidence, not as newspapers, but as representing the public which the newspapers inform.

Many people believe that successful publicity consists in the cultivation of pleasant personal relations with newspaper writers, and that if "the newspaper boys" are made to feel good all will be well. Such a theory is fundamentally unsound.

Of course, every man, be he newspaper man or otherwise, should be treated with courtesy, and the newspaper man should receive all facilities for obtaining facts to which the public is entitled. But to rely upon friendly interpretation of one's acts in any large way by the newspapers simply because of one's personal friendship is just as false a procedure as to seek a favorable judgment from a court because of one's pleasant personal relations with the judge.

A newspaper which bestows favors because of the personal friendships of its writers is sure to lose its influence; and a corporation which does not look beyond the newspaper and direct its policy with reference to satisfying that paper's readers is sure to be disappointed.

WHEN AND HOW TO USE PUBLICITY

Publicity is of no use whatever, unless the fundamental policy of the company itself is honest and sincere. Even if a company's policy is honest and sincere, it must not be taken for granted that the people fully realize its character. Publicity for that policy is absolutely necessary.

People are thinking of their own affairs, and if a company's service is fairly satisfactory they are not likely to give it much thought until trouble arises. Then they think not so much of the generally good service as of the trouble. That becomes magnified. Continuous publicity of good work would have softened a public irritation in the day of trouble.

No public service corporation can satisfy everybody. The majority of people are indeed fair, but there are always some who consider that a public service company should be run for their particular benefit, instead of for the greatest good of the greatest number. In order that the criticism of such people be not given undue weight it is important that a company keep the public informed day by day and make itself understood.

> **The functions of a publicity man are not to "hush things up," and "put things over," but to interpret his company to an enlightened public opinion and to interpret an enlightened public opinion to his company.**
>
> **In this era of a tremendous outpouring of literature of all kinds the man or company who can arouse curiosity has made a real step forward.**
>
> **A central bureau of advice on public relations would serve as a power house of publicity assistance, but the local company must always turn on the power.**

THE VALUE OF A PUBLICITY ENGINEER

Every company which can do so should employ a publicity engineer—preferably an experienced newspaper man—to advise with its officers and to act with them in all matters of public relationship and in the cultivation of general good will. Such a man should know what the public is interested in. There are many facts in the operation of public service corporations which are interesting and important. If the local newspapers knew about them they would gladly send members of their staff to get material for their columns.

The publicity man will know what the newspapers would send for if only they had the suggestion. He will write the matter the way the papers want it. In cases of accidents such a man is promptly on hand to see that the newspapers get those facts which the public is properly entitled to.

Of course, no one wants to co-operate with the "ambulance chaser," and neither the newspapers nor the public have any great interest in trivial accidents, however regrettable they may be from the point-of-view of the victims. On the other hand nothing irritates either the newspapers or the public more, when a serious accident occurs, than trouble in getting accurate information promptly.

This adviser in public relations—for such a man should be far more than a mere publicity agent—should constantly study the temper of the public mind. He should know criticisms of his company which are being made; he should know of improvements to its service which a company might effect with popular approval.

Some people seem to think that the functions of a publicity man are to "hush things up," and to "put things over." On the contrary, his work, in a word, will be to interpret his company to an enlightened public opinion and to interpret an enlightened public opinion to his company.

WRITE IN LANGUAGE THAT ALL CAN UNDERSTAND

It so often happens that when in matters of policy it is desired to make a statement to the local public the railway manager thinks it the wise thing to have a lawyer prepare the document. That is another fundamental mistake. Lawyer's functions are with the courts and commissions, in the conduct of negotiations, in the preparation of contracts, and in other purely legal activities.

When the man of legalistic mind attempts to speak to the public he usually encumbers his utterances with a mass of irrelevant facts or unintelligible jargon which makes the whole document vague and unreadable to the average man.

In the preparation of statements to the public, directness and terseness, even colloquialism, are of the utmost importance. The reason Billy Sunday is so effective is because he speaks the language of the people. The clergyman in the gown may use more elegant English, but if his real purpose is to reach the heart of man, he must realize how infinitely more effective is the homely straightforwardness of Billy Sunday.

Therefore, let the railroad manager accept the counsel of his adviser in public relations in the preparation of statements to the public, whether they concern either matters of routine operation or corporate policy—that is, assuming that he wants the people to know exactly what he means.

STAND BACK OF EVERY STATEMENT

And right here let it be urged that every statement from a public service corporation should be authoritative, issued preferably on stationery bearing the name of the company and the name of the president. Every newspaper, in fact every person, receiving such a statement should know whence it comes and who stands sponsor for it.

Nothing is more futile than any devious or indirect method of publicity. It may be that a company can at times induce the newspaper to publish as its own something which the corporation wants to have said. But unless the statement is in every detail truthful and embodies the honest policy of the newspaper itself no such effort on the part of a corporation can be successful. This leads to a discussion of advertising.

A public service corporation should take all of the advertising space it can afford to pay for. It should constantly inform the local public concerning its policy and daily work. Unless these are matters of current moment a newspaper cannot regard them as news. But it is none the less important that the public be constantly informed concerning them.

One of the greatest merchants in the world is H. Gordon Selfridge, an American, who runs a large department store in London. Mr. Selfridge has a big advertisement in the London morning papers every day telling of his prices, bargains and other strictly mercantile data.

SELFRIDGE TELLS ALSO OF HIS POLICIES AND IDEALS

But in the afternoon papers he pays for a column of space in which to tell of the general policies, the ideals, the principles of the House of Selfridge.

I question very much whether this advertisement in the afternoon papers does not contribute vastly more, in the long run, to the success of the firm than the purely commercial advertising. It is human nature for people to do business with those whom they trust, those in whose ideals they believe. Such advertising of one's ideals creates just that atmosphere of confidence.

It follows that, if a railroad corporation wishes the extension of a franchise, if it seeks relief from burden-

> **"EVERY company which can do so should employ a publicity engineer—preferably an experienced newspaper man—to advise with its officers and to act with them in all matters of public relationship and in the cultivation of general goodwill. Such a man should know what the public is interested in. There are many facts in the operation of public service corporations which are interesting and important. * * ***
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> **"The publicity man will know what the newspapers would send for if only they had the suggestion. He will write the matter the way the papers want it."—Ivy L. Lee.**

some taxation, or if it appeals for public support in any controversy, its appeals will fall upon receptive or deaf ears just in the proportion that the company enjoys the confidence, the real confidence, of the people whom it serves. And this confidence will be based upon actual observation of its service and such interpretation of its service as the company may, by appropriate publicity, truthfully make.

Experience has proved that the quickest way to get the company's story to the greatest number of readers is through advertising columns, where the company can write its own headlines and use type in the way best calculated to claim attention.

OTHER OPPORTUNITIES FOR PUBLICITY

Newspapers are not the only media of communicating with the public. Every railroad corporation has in its stations and cars an opportunity to create a medium of communication of its own, through cards and posters. Car cards are read first because they are short; and second because people cannot help seeing them. As in a movie theater, so here there is only one thing to look at.

Every electric railway company should avail itself of this medium to the umost. To do so it is necessary to make the cards interesting, make them pertinent, make them newsy. They should never be allowed to become an old story. Such cards should be appropriately illustrated, if possible, but they should most certainly be changed frequently.

But neither the newspapers nor the car cards can convey to all constituents of a company all of the data which people should have in order to interpret the company's acts. Those companies which have tried it have found it profitable to issue publications of their own. Such publications arouse the interest of employees; they form the basis for information for editorial comment by newspapers; they are media of communication with city officials, taxpayers' organizations and the like.

Such publications should be brief, very brief. My own experience has shown that it is much better to issue such publications irregularly—only when one has something important to say—rather than at stated intervals.

If issued at irregular intervals, those receiving such a publication are likely to wonder as to the occasion for its issuance at the time. It arouses curiosity. And in this era of a tremendous outpouring of literature of all kinds, the man or the company who can arouse curiosity has made a real step forward.

AROUSE CURIOSITY FIRST

Someone has said that advertising is the roadway to a man's mind. The way to make people read advertisements is first to arouse curiosity.

Both the railway manager and his adviser in public relations should give unusual attention to public bodies of all kinds, not with a view to exerting any but proper influences, but with a view to insuring that the members of such bodies are well informed concerning the policies of the company.

If the head of the company or if his adviser in public relations is a good speaker, the company has an exceptionally valuable asset. The community always likes to hear at first hand of the affairs of its public service corporations.

WHAT A CENTRAL BUREAU CAN DO

The problem of the public service corporation will have to be solved separately according to the conditions in each local community. Especially is this true of electric railways. Any effective bureau of publicity to conduct wholesale the public relations of all electric railway companies is an impossibility.

But the fact remains that there are certain general problems which do concern all electric railways. Of these, the problem most fundamental is that of the fixed five-cent fare and its relation to the fact that the costs of operation and the amount of service expected for that fare are constantly increasing.

A central bureau can be of tremendous use in making a study of the service given for five cents in different cities and the conditions surrounding that service, and in supplying the results of the study to each company for interpretation and comparison.

The jitney problem concerns nearly all companies. The way it is being met in different communities and the methods used to cultivate sound public opinion with reference to it could very well be studied by a central bureau and the results placed at the disposal of each company for use.

So with reference to questions of paving, taxation, franchise permits, and service requirements by regulating commissions—all of these questions are of universal interest.

Likewise, local problems are constantly arising in the affairs of every company, concerning which information of the experience of other companies can be furnished by a central organization.

The American Electric Railway Association is an admirable organization for this. Under the direction of its committee on social relations a bureau could be created to be placed in contact with companies throughout the country needing its help.

ACTUAL THINGS A PUBLIC RELATIONS BUREAU COULD WELL DO

Such a bureau could give specific advice to railway companies in connection with the establishment of publicity departments, and criticism and suggestions could be given concerning material to be issued to local communities. Publications could be edited on the basis of material supplied by the companies; car cards could be prepared, and other matters could be handled for use in each community concerning such problems as all companies have to meet.

Such a central bureau should work entirely through local companies and should not assume itself to conduct any campaign of education with reference to the general problems. Any effort, however, to avoid treatment of local problems by the local company is likely to prove wasted.

A central bureau of advice on public relations as outlined would serve as a sort of power house of publicity assistance, to which the wires of any company could be attached at will. But the local company must always turn on the power, and guide the machine.

Advertising the Twin City Lines

By A. W. Warnock

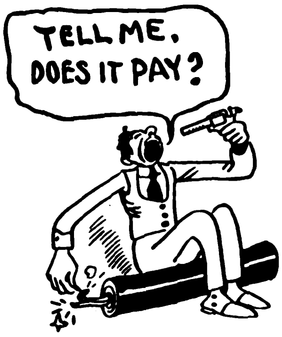
General Passenger Agent Twin City Lines, Minneapolis and St. Paul

AN ANALYSIS *of the Policies Behind the Publicity of the Minneapolis and St. Paul Companies—Some Examples of Advertisements Produced to Inform the Public of Causes of Delays and Changes in Routes.*

NOT so many years ago street railway companies generally took little or no interest in the broad subject of Publicity—a term we seem to have substituted to-day for the good old-fashioned word Advertising. True, we were always glad to have the press speak well of us if it felt so disposed, and conversely we were always pained to hear ill things said of us. Aside from an occasional paid "story" of our properties on some special occasion, however, no company really and truly adopted advertising as a strong aid to its success. It is to be doubted, indeed, whether we ever spent any money in advertising except under duress or protest—never, I suppose, because it was the sensible, business-like thing to do so.

The past ten years have seen street railway companies everywhere undertake practical, continuous advertising campaigns, and from the good widespreading results that we all know have followed, it is now a foregone conclusion that the day has gone when the right of advertising to a permanent place on the payroll of every progressive company will be questioned.

Great care should be employed in the management of a street railway company's advertising expenditures. In a day of "pitiless publicity" when every business, profession and calling seems to employ a press agent who is screaming at the top of his voice, and when puffs and notices are seen so frequently in the columns of our papers delicately extolling the merits of men, wine, women, songs and other commodities, perhaps we might give pause and see that our advertising is properly done, so that it may ring true and make the proper impression on the reader.


TELL ME, DOES IT PAY?

There is danger, a great danger, that lack of care in such endeavor may work greater harm than good for us, and pessimistically we may ask ourselves the question, "Tell me, does it pay?" in the same way as the hopeless man shown in a recent cartoon which we reproduce herewith simply to show how very hopeless that is. This cartoon suggests the splendid series of publicity cartoons and talks which have been appearing in the ELECTRIC RAILWAY JOURNAL for some weeks past. Those talks and cartoons have expressed so clearly and aptly so many wholesome ideas on the subject that it is hoped the JOURNAL will republish them in some permanent form for their educational value to us all.

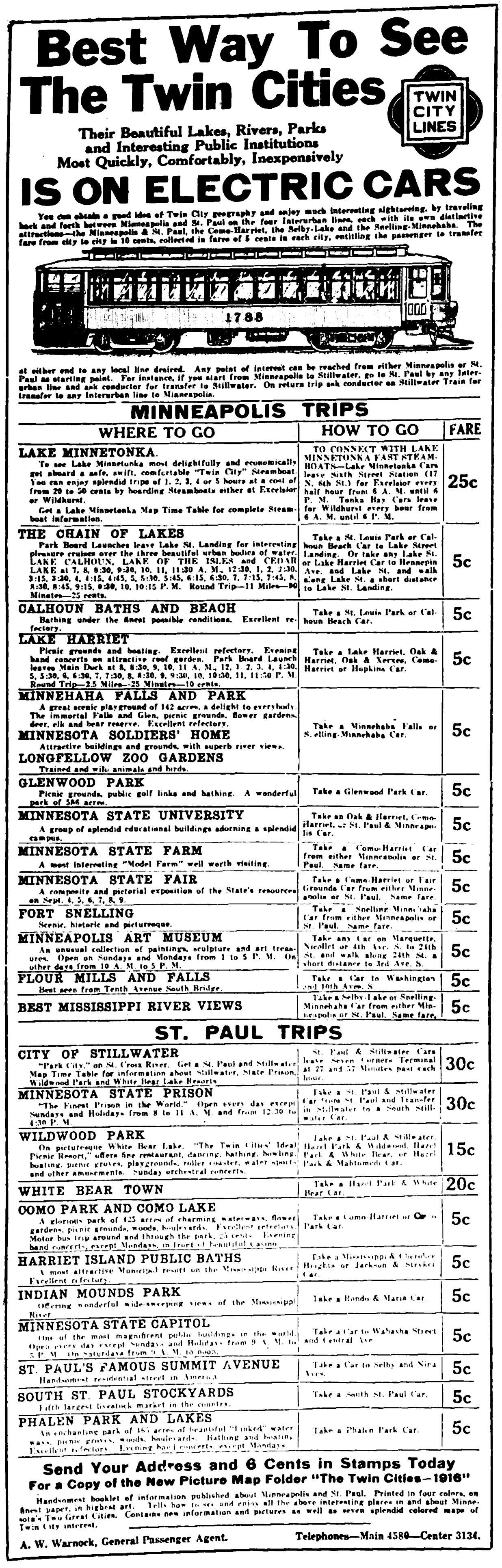
A. W. WARNOCK

THE ADVERTISING DEPARTMENT STARTED IN 1906

In view of the request of the ELECTRIC RAILWAY JOURNAL for an explanation of the simple working methods of the advertising policies of Twin City Lines, it may be of interest to say that exactly eleven years ago we organized an advertising department in connection with the General Passenger Department, and, like the patent-medicine testimonial, we can honestly say, "We wouldn't be without it in the house since buying our first bottle."

Prior to 1906, our company, like all electric or steam companies, was on the old-fashioned trading basis with the newspapers in our territory. We issued perhaps $8,000 worth of free tickets every year to the papers and carried their bundles of papers free, while they in turn gave us such "kindly mention" from time to time as they thought proper. The opening of a new extension, the purchase or building of some new cars, the installation of a new power house—these were all subjects for news stories regarding our property. One hand washed another, and the balance, if there was any, no matter in whose favor, automatically wiped itself out at the end of each year.

Just at this time the air all over the country was beginning to be surcharged with sentiment against free transportation of all kinds, and the days of the trading plan were numbered. In February, 1906, nearly one year before the Interstate Commerce Commission put a stop to the wholesale issuance of transportation in general and advertising transportation in particular, we put our relations with our newspapers on a strictly business basis—as much to their gratification and satisfaction as our own. All free transportation to newspapers was cancelled, and a charge of one-quarter cent a pound was made for the carriage of their bundles to local city points and one-half cent a pound to interurban points. Then it was we got down to a brass-tack basis of making definite advertising contracts for such space as we thought we needed. The papers thus received no favors from us, and we received none from them. I do not know whether newspapers in other cities are differently constituted than ours, but eleven years of such a business-like policy has taught us how just and fair the papers are in their attitude to a public service enterprise such as ours. If we are faulty in service, if we need reproof—in fine, if we are guilty of errors either of omission or commission, we hear from the papers promptly in big black type, to our discomfiture, perhaps. But if we do the decent thing by the communities we serve and give evidence of such purpose,



Best Way To See The Twin Cities

TWIN CITY LINES

Their Beautiful Lakes, Rivers, Parks
and Interesting Public Institutions
Most Quickly, Comfortably, Inexpensively

IS ON ELECTRIC CARS

You can obtain a good idea of Twin City geography and enjoy much interesting sightseeing, by traveling back and forth between Minneapolis and St. Paul on the four Interurban lines, each with its own distinctive attractions—the Minneapolis & St. Paul, the Como-Harriet, the Selby-Lake and the Snelling-Minnehaha. The fare from city to city is 10 cents, collected in fares of 5 cents in each city, entitling the passenger to transfer at either end to any local line desired. Any point of interest can be reached from either Minneapolis or St. Paul as starting point. For instance, if you start from Minneapolis to Stillwater, go to St. Paul by any Interurban line and ask conductor for transfer to Stillwater. On return trip ask conductor on Stillwater Train for transfer to any Interurban line to Minneapolis.

MINNEAPOLIS TRIPS

WHERE TO GO	HOW TO GO	FARE
LAKE MINNETONKA. To see Lake Minnetonka most delightfully and economically get aboard a safe, swift, comfortable "Twin City" Steamboat. You can enjoy splendid trips of 1, 2, 3, 4 or 5 hours at a cost of from 20 to 50 cents by boarding Steamboats either at Excelsior or Wildhurst. Get a Lake Minnetonka Map Time Table for complete Steamboat information.	TO CONNECT WITH LAKE MINNETONKA FAST STEAMBOATS—Lake Minnetonka Cars leave Sixth Street Station (17 N. 6th St.) for Excelsior every half hour from 6 A. M. until 6 P. M. Tonka Bay Cars leave for Wildhurst every hour from 6 A. M. until 6 P. M.	25c
THE CHAIN OF LAKES Park Board Launches leave Lake St. Landing for interesting pleasure cruises over the three beautiful urban bodies of water, LAKE CALHOUN, LAKE OF THE ISLES and CEDAR LAKE at 7, 8, 8:30, 9:30, 10, 11, 11:30 A. M., 12:30, 1, 2, 2:30, 3:15, 3:30, 4, 4:15, 4:45, 5, 5:30, 5:45, 6:15, 6:30, 7, 7:15, 7:45, 8, 8:30, 8:45, 9:15, 9:30, 10, 10:15 P. M. Round Trip—11 Miles—90 Minutes—25 cents.	Take a St. Louis Park or Calhoun Beach Car to Lake Street Landing. Or take any Lake St. or Lake Harriet Car to Hennepin Ave. and Lake St. and walk along Lake St. a short distance to Lake St. Landing.	5c
CALHOUN BATHS AND BEACH Bathing under the finest possible conditions. Excellent refectory.	Take a St. Louis Park or Calhoun Beach Car.	5c
LAKE HARRIET Picnic grounds and boating. Excellent refectory. Evening band concerts on attractive roof garden. Park Board Launch leaves Main Dock at 8, 8:30, 9, 10, 11 A. M., 12, 1, 2, 3, 4, 4:30, 5, 5:30, 6, 6:30, 7, 7:30, 8, 8:30, 9, 9:30, 10, 10:30, 11, 11:30 P. M. Round Trip—2.5 Miles—25 Minutes—10 cents.	Take a Lake Harriet, Oak & Harriet, Oak & Xerxes, Como-Harriet or Hopkins Car.	5c
MINNEHAHA FALLS AND PARK A great scenic playground of 142 acres, a delight to everybody. The immortal Falls and Glen, picnic grounds, flower gardens, deer, elk and bear reserve. Excellent refectory. **MINNESOTA SOLDIERS' HOME** Attractive buildings and grounds, with superb river views. **LONGFELLOW ZOO GARDENS** Trained and wild animals and birds.	Take a Minnehaha Falls or Snelling-Minnehaha Car.	5c
GLENWOOD PARK Picnic grounds, public golf links and bathing. A wonderful park of 586 acres.	Take a Glenwood Park Car.	5c
MINNESOTA STATE UNIVERSITY A group of splendid educational buildings adorning a splendid campus.	Take an Oak & Harriet, Como-Harriet, or St. Paul & Minneapolis Car.	5c
MINNESOTA STATE FARM A most interesting "Model Farm" well worth visiting.	Take a Como-Harriet Car from either Minneapolis or St. Paul. Same fare.	5c
MINNESOTA STATE FAIR A composite and pictorial exposition of the State's resources on Sept. 4, 5, 6, 7, 8, 9.	Take a Como-Harriet or Fair Grounds Car from either Minneapolis or St. Paul. Same fare.	5c
FORT SNELLING Scenic, historic and picturesque.	Take a Snelling-Minnehaha Car from either Minneapolis or St. Paul. Same fare.	5c
MINNEAPOLIS ART MUSEUM An unusual collection of paintings, sculpture and art treasures. Open on Sundays and Mondays from 1 to 5 P. M. On other days from 10 A. M. to 5 P. M.	Take any Car on Marquette, Nicollet or 4th Ave. S. to 24th St. and walk along 24th St. a short distance to 3rd Ave. S.	5c
FLOUR MILLS AND FALLS Best seen from Tenth Avenue South Bridge.	Take a Car to Washington and 10th Aves. S.	5c
BEST MISSISSIPPI RIVER VIEWS	Take a Selby-Lake or Snelling-Minnehaha Car from either Minneapolis or St. Paul. Same fare.	5c

ST. PAUL TRIPS

CITY OF STILLWATER "Park City," on St. Croix River. Get a St. Paul and Stillwater Map Time Table for information about Stillwater, State Prison, Wildwood Park and White Bear Lake Resorts.	St. Paul & Stillwater Cars leave Seven Corners Terminal at 27 and 57 Minutes past each hour.	30c
MINNESOTA STATE PRISON "The Finest Prison in the World." Open every day except Sundays and Holidays from 8 to 11 A. M. and from 12:30 to 4:30 P. M.	Take a St. Paul & Stillwater Car from St. Paul and Transfer in Stillwater to a South Stillwater Car.	30c
WILDWOOD PARK On picturesque White Bear Lake. "The Twin Cities' Ideal Picnic Resort," offers fine restaurant, dancing, bathing, bowling, boating, picnic groves, playgrounds, roller coaster, water sports and other amusements. Sunday orchestral concerts.	Take a St. Paul & Stillwater, Hazel Park & Wildwood, Hazel Park & White Bear, or Hazel Park & Mahtomedi Car.	15c
WHITE BEAR TOWN	Take a Hazel Park & White Bear Car.	20c
COMO PARK AND COMO LAKE A glorious park of 425 acres of charming waterways, flower gardens, picnic grounds, woods, boulevards. Excellent refectory. Motor bus trip around and through the park, 25 cents. Evening band concerts, except Mondays, in front of beautiful Casino.	Take a Como-Harriet or Como Park Car.	5c
HARRIET ISLAND PUBLIC BATHS A most attractive Municipal resort on the Mississippi River. Excellent refectory.	Take a Mississippi & Cherokee Heights or Jackson & Stryker Car.	5c
INDIAN MOUNDS PARK Offering wonderful wide-sweeping views of the Mississippi River.	Take a Rondo & Maria Car.	5c
MINNESOTA STATE CAPITOL One of the most magnificent public buildings in the world. Open every day except Sundays and Holidays from 9 A. M. to 5 P. M. On Saturdays from 9 A. M. to noon.	Take a Car to Wabasha Street and Central Ave.	5c
ST. PAUL'S FAMOUS SUMMIT AVENUE Handsomest residential street in America.	Take a Car to Selby and Nina Aves.	5c
SOUTH ST. PAUL STOCKYARDS Fifth largest livestock market in the country.	Take a South St. Paul Car.	5c
PHALEN PARK AND LAKES An enchanting park of 465 acres of beautiful "Linked" waterways, picnic groves, woods, boulevards. Bathing and boating. Excellent refectory. Evening band concerts, except Mondays.	Take a Phalen Park Car.	5c

Send Your Address and 6 Cents in Stamps Today
For a Copy of the New Picture Map Folder "The Twin Cities—1916"

Handsomest booklet of information published about Minneapolis and St. Paul. Printed in four colors, on finest paper, in highest art. Tells how to see and enjoy all the above interesting places in and about Minnesota's Two Great Cities. Contains new information and pictures as well as seven splendid colored maps of Twin City interest.

A. W. Warnock, General Passenger Agent. Telephones—Main 4580—Center 3134.

TWIN CITY ADVERTISING—THREE-COLUMN ADVERTISEMENT FOR "NEW BUSINESS"

we are backed up by the papers and given equal credit. Could anything be fairer?

We have six large daily newspapers in the Twin Cities and we treat them all exactly alike as to volume of space purchased. We play no favorites at any time or under any circumstances. Line for line, each paper receives exactly the same number each year. Our first contracts, made in 1906, were for 14,000 agate lines of space in each paper, and from time to time, as our necessities have required we have raised that amount, until our contracts for 1916 were for 42,000 agate lines for each paper. That is the principle followed for the large dailies. Such city weeklies as we use receive contracts based on their character, influence and circulation. In small towns and villages served by our interurban lines, we give each weekly paper the same amount of money for the insertion of a 5-in., single-column timetable advertisement for the entire year. Some of the small-town papers figure such a service at $10 or $15 less than is asked by the largest paper, but we believe that each paper in its own town is as important as any other, and so the general standard highest figure is adopted by us as the basis for all. A good, clean, well-edited weekly paper is a big asset for any little town, and should be treated liberally.

The space purchased, comes now the logical question what do we put into it?

KINDS OF ADVERTISEMENTS PUBLISHED

Strange as it may seem, we devote only a part, a very small part, of our space to what might be termed the solicitation of new business. From May 15 until Sept. 30 we operate a fleet of seven passenger and excursion steamboats on Lake Minnetonka in connection with our two interurban lines from Minneapolis, and that service offers material for limited exploitation for the short period of three months, June, July and August. From Memorial Day to Labor Day we also operate Wildwood Park, a resort on White Bear Lake, reached by another of our interurban lines from St. Paul, and some space is used for that. Of all our advertising efforts we can say honestly that we have found the best general advertisement to have been a three-column announcement, giving in table form the list of places of interest reached by our lines, a few words concerning each place, the cars to take to reach them and the rates of fare. During the summer season we constantly use such a standard bid for new traffic, and from the expressions of many strangers and home people alike, we believe it gives just the street-car information people want.

But the bulk of our contracted space, the large bulk, is used simply and primarily to keep the public of the communities we serve informed of our general service.

"Why was my car late coming along to take me to my work this morning?" "Why was I delayed getting home from my work last night?" "What is the reason for rerouting such a line?" "When will such a line be opened?" "What are my transfer privileges?" "What is the reason for this and that and the other thing?"

These are some of the many subjects we discuss in our announcements from time to time. Take the matter of delays. How exasperating it is never to know what delayed your car going to or from your work, to find your line rerouted arbitrarily without advance notice, not to be advised of new transfer privileges, or not given reasons for changes in service which you as a patron are justly entitled to receive!

For several years we have printed from day to day, as occasion requires, a Street Car Delay advertisement in all our daily papers. The purpose is to answer the many delay questions which naturally arise in the car patron's mind. A specimen advertisement is submitted.

No delay is announced unless it has been for ten minutes or more, and all delays, whether our own fault or that of others, are recorded. If defective equipment was the cause, we report it as readily as though some drayman's wagon broke down on our tracks, although we never mention the drayman's name. We do not say "The Peerless Draying Company's wagon, broken down on our track, delayed the Hennepin Ave. Line," but "A wagon broken down," etc. The fairness of such a rule is obvious. These delays are reported to our office by the general superintendent by 11 a. m. each day, and at 11:45 a. m. they are in six newspaper offices ready for afternoon editions. Thus the patron reads about the cause of his morning delay on his way home or at his fireside in the evening. We have received from our patrons literally hundreds of favorable comments on these announcements and can recommend such publicity highly to all companies. The announcements should be boiled down hard, and simply state facts—the facts the passenger wants to know. These advertisements will probably average each about 80 agate lines, single-column space. We have tried all sorts of typographical arrangements, but the sample submitted seems to fill the bill best of all and is a style we have followed for a long time. Good-sized, easily read type should be used in a generous space.

Our advertisements covering new features of service usually occupy a space equivalent to three columns wide and 8 in. or 9 in. deep, about 350 to 400 agate lines. A liberal use of white space to make the advertisement attractive and a rather standard typographical style we have found to be two good rules. Perhaps the reproduction of some specimen announcements may give an idea as to the methods we employ in this respect. The importance of the announcement necessarily determines the size of the space used. We have taken as much as a "two-page spread" (two pages opposite each other) to tell of important work done or of several new lines to be opened. There was such a case two years ago, when we explained the amount of improvements undertaken during the unusually heavy summer season of 1914. The advertisement went into the details as to the building of 45.72 miles of new track in 1914, which meant 23.27 miles of new lines and 22.43 miles of old lines rebuilt, also 165,963 square yards of new paving laid and 100 new cars built, as well as all the news details of the opening of the new lines for service.

Street Car Delays

WEDNESDAY, NOV. 15.

The following delays occurred at the railroad crossing at Franklin and Cedar Aves: from 12:45 A. M. 10 minutes; from 6:02 A.M. 12 minutes; from 4:40 P.M. 11 minutes.

A vehicle broken down on the track at Plymouth Ave. and 6th St. held the Plymouth & Bloomington Line 10 minutes from 12:05 P.M.

A Car off the track at University Ave. and Oak St. delayed the Oak & Harriet Line 34 minutes from 6:55 P.M. Extra Cars were sent out from East Hennepin Ave. and 4th St. so that there was little delay from that point West.

A broken trolley wire at Hennepin and Douglas Aves. delayed the Westbound Hennepin Ave. and Monroe & Bryant Lines, Southbound, for 15 minutes from 7:20 A.M.

On account of a fire on Fremont Ave. the Chicago & Fremont Line was delayed, Southbound, for 22 minutes from 3:50 P.M., although extra Cars were filled in the line from Washington and 20th Aves. N. making the delay in the Loop only 8 minutes.

A horse fallen down on the slippery pavement at 2nd Ave. S. and 5th St. blocked the St. Paul & Minneapolis and Minnehaha Falls Lines for 18 minutes from 9:54 A.M. necessitating a rerouting of those Cars through the Loop District.

On account of the burning out of a transmission cable, there was no power and all lines were delayed 10 minutes from 2:15 P.M.

TWIN
CITY
LINES

Complaints and Suggestions Always Receive Prompt, Courteous Attention.

A.W.Warnock, General Passenger Agent,
Hennepin Ave. and 11th St.

Telephones—N. W. Main 4560—T. S. 33134.

ADVERTISEMENT ANNOUNCING CAUSES OF DELAYS

This information had a strong news value, and the newspapers would have been glad to have printed it at length, but we preferred to take a large amount of space to tell the story in our own way and at our own time. That naturally suggests the idea that we do not offer news stories to newspapers, unless we are asked to do so, or unless we know it is real out-and-out news such as they would ask for if they knew of its existence with us. City and managing editors have grown to look with cold eyes on the Greek bearing gifts in the guise of professional "press agents" with "hot news stories." Why should papers print anything about the building of your wonderful new smoke stack, or any of your other doings? If the smoke stack should fall down in the course of erection, that's news, but not otherwise. Be ready to give the news that is asked, and to tell the real damage the smoke stack did in falling. Nowadays, very properly, it seems to be bad form to work a willing press for free "puffs" and "send-offs." An over-enthusiastic, over-zealous press agent, measuring his results by the number of inches of free space he gets in the papers for "the pieces" he writes, is likely to be a dangerous person to have access to a public-service corporation's closest confidences. So much depends upon the horse sense of the man acting as the megaphone for your property!

It is regrettable that in too many companies in the past the idea of publicity was to tell only what the management wanted to tell, not what the public had a right to know and what it should have been told. There have been instances where it was the vogue to hand out a plate of carefully selected scraps of news at the back door to reporters, under the mistaken notion that the giver was bestowing priceless gifts on the receiver.

Complaints and Suggestions
Always Receive
Prompt and Courteous Attention

TWIN CITY ADVERTISING—SLOGAN PUT ON ALL ADVERTISEMENTS OF THE TWIN CITY LINES

Our papers like to print our monthly financial statement, and on the same day that such a statement is released in New York, copies are sent to all the papers in Minneapolis and St. Paul. Usually telephone inquiries from the papers follow the receipt of these statements, asking for the cause of the decrease or increase of earnings shown. Last month one city editor called us up and asked to what we attributed such heavy earnings for a month. We explained that it was because of the natural good times prevalent in the Twin Cities, everybody at work and so many folks riding. That was all right as far as it went, but he wanted further explanation.

"It's the same prosperity reason that accounts for the fact that your paper last night had 48 pages with 100 per cent more advertising at 25 per cent higher rates than a while ago when you had only 16 pages."

"I'm on," the editor laughingly replied. "I guess ours is a good deal better game than yours."

Reporters readily can see anybody they want to see in our offices, and if they prefer to see the president or any other officer than our publicity department they are always welcome. Doors leading to executive offices with "PRIVATE" in neat gilt letters fortunately are passing out of vogue. People with grievances or proper inquiries in their minds should not be met with rebuffs or obstacles at the start when they visit public servants —which we all are. Accessibility breeds friends. "WELCOME" looks decidedly better on a door than "NO ADMITTANCE."

We have a slogan which we put at the bottom of every advertisement we print, whether a newspaper announcement, car window card or any other form of publicity. It is a true and tried friend, and we always try to back up the promise contained in it with kindly and cheerful performance on our part. This slogan is shown on page 21.

We have explained as fully as seems desirable our advertising as applied to newspapers. There are still some other forms of publicity we have used for some years with most satisfactory results.

OTHER FORMS OF PUBLICITY

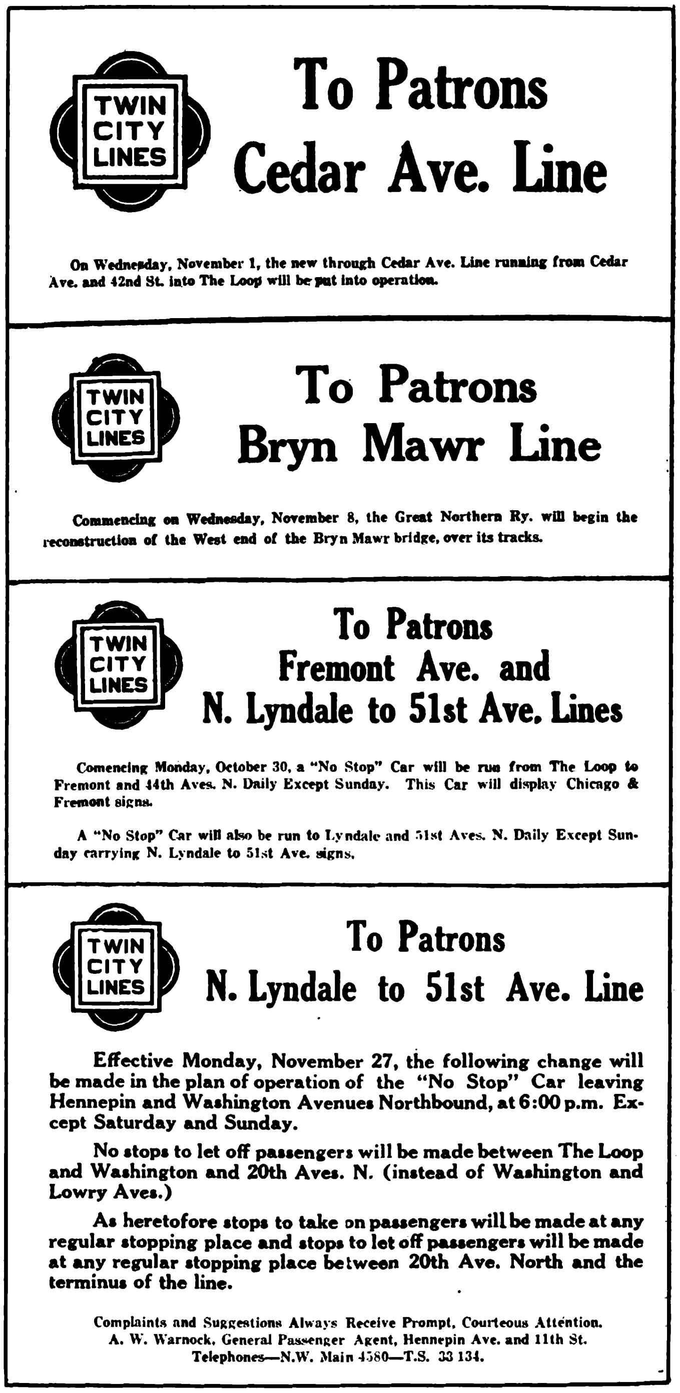
At an early date in 1917 we will issue our twelfth annual folder entitled, "The Twin Cities To-day." The purpose of this folder is primarily to exploit the Twin Cities and their attractive surroundings, and secondarily and indirectly to advertise the Twin City Lines and the service they offer. This folder has been an annual feature with this company, as stated, for eleven years, and it is issued in improved form each year, although the shape is never changed. The folder consists of 64 pages 4 in. x 9 in. when folded and opening up to 9 in. x 32 in., printed in four colors and illustrated with a large number of fine maps and halftones, on the best paper obtainable. This folder is offered in the daily papers in the Twin Cities and throughout the State of Minnesota and elsewhere in a small advertisement from May until September. A copy is mailed upon receipt of six cents in stamps, although it costs nearly double that amount. On the average, seventy-five letters requesting copies are received daily from all over the country from persons who intend to visit the Twin Cities for a vacation, to stop over on their way west, or to move to the Twin Cities to reside. The nine steam railroads running into the Twin Cities distribute this folder over the counters of their city ticket offices in the Twin Cities as well as in all their leading offices throughout America. It is not an uncommon experience to receive a letter from a man in New York or Chicago asking about the advantages of the Twin Cities before he starts on a journey to the Coast. This folder is also found in hotel time-table racks everywhere in the Twin Cities, and it is on all the passenger steamships plying between Duluth and Buffalo on the Great Lakes, as well as on the large river boats running on the Mississippi River between St. Paul and St. Louis. It is used in the Twin City schools as a text book for Twin City geography. Civic associations in Minneapolis and St. Paul use it as an aid in influencing desirable people to come to our cities to live.

This folder is also distributed in the information bureaus of all the large department stores in the Twin Cities, in the public libraries, and in all other places where strangers are likely to visit. The leading hotel of St. Paul and the leading hotel of Minneapolis make it a rule to put a folder in each room on the arrival of a new guest. The first thing that a guest to either of these hotels sees is one of the Twin City folders with its collection of street railway maps and information for his benefit. We got that pleasant idea from a hotel in Heidelburg, Germany.

Possibly the reason why the folder is acceptable in so many places is because of its character, for while we do not waste money on its preparation, nevertheless from a mechanical point of view, it is prepared with all the skill and taste that the best artists, mapmakers and printers can summon to their aid. It has been our constant aim to make it so distinctive as to be in a class by itself. The good these annual folders have done for us has been immeasurable.

Right here may we suggest that the reason why so much printed matter, regardless of how "clever" it may be, does not always do its greatest good is because no intelligent carefully thought-out plan is drawn up and followed for its distribution. The best folder is worthless and really represents a waste of time, paper, ink and money unless it gets into the hands of prospective riders on your cars, the people you prepare the folder for and whom you want to reach.

We carry in two upper sash windows of all our cars two six-ply car cards, measuring 14 in. x 25 in., on which is displayed general information which we believe is most essential in following up our advertising satisfactorily. These cards carry constant daily invitations and reminders to passengers to bring their grievances to us for prompt attention.



TWIN CITY LINES

To Patrons
Cedar Ave. Line

On Wednesday, November 1, the new through Cedar Ave. Line running from Cedar Ave. and 42nd St. into The Loop will be put into operation.

TWIN CITY LINES

To Patrons
Bryn Mawr Line

Commencing on Wednesday, November 8, the Great Northern Ry. will begin the reconstruction of the West end of the Bryn Mawr bridge, over its tracks.

TWIN CITY LINES

To Patrons
Fremont Ave. and
N. Lyndale to 51st Ave. Lines

Comencing Monday, October 30, a "No Stop" Car will be run from The Loop to Fremont and 44th Aves. N. Daily Except Sunday. This Car will display Chicago & Fremont signs.

A "No Stop" Car will also be run to Lyndale and 51st Aves. N. Daily Except Sunday carrying N. Lyndale to 51st Ave. signs.

TWIN CITY LINES

To Patrons
N. Lyndale to 51st Ave. Line

Effective Monday, November 27, the following change will be made in the plan of operation of the "No Stop" Car leaving Hennepin and Washington Avenues Northbound, at 6:00 p.m. Except Saturday and Sunday.

No stops to let off passengers will be made between The Loop and Washington and 20th Aves. N. (instead of Washington and Lowry Aves.)

As heretofore stops to take on passengers will be made at any regular stopping place and stops to let off passengers will be made at any regular stopping place between 20th Ave. North and the terminus of the line.

Complaints and Suggestions Always Receive Prompt, Courteous Attention.
A. W. Warnock, General Passenger Agent, Hennepin Ave. and 11th St.
Telephones—N.W. Main 4580—T.S. 33 134.

TWIN CITY ADVERTISING—ANNOUNCEMENT OF CHANGES IN ROUTES

The past year we have issued pocket time-tables of each of our local lines for the information of patrons. We do not show the time where the headway is very frequent during the rush hours, but practically all cars are shown from all terminals on all lines from midnight to midnight. The signs and routes of each line are given, and altogether a patron with one of these time-tables in his pocket experiences a feeling of satisfaction in knowing just what service he has a right to expect on his line. We all know how patrons have the habit of writing for such information, and so we give it to them in neatly printed form. One folder gives the car signs and routes of all the lines of our system. How times have changed! Think of issuing a street railway time-table in the old horse-car days!

To make his advertising fulfill its mission and get results, whether the commodity he is offering be groceries, pianos or street-car service, the advertiser must do exactly what he says he will do and give exactly what he promises to give, tying up each transaction with those silken strings called courtesy and considerate service. A public-service corporation must make even greater efforts to back up its promises with civil, efficient performance. You must first believe absolutely —or, at least, most of it—is reasonable, and that good will on your part will beget good will on the public's part. You must stand ready and willing to do the right and reasonable thing at all times as well as to receive with an open mind any complaints and suggestions, whether they be reasonable or unreasonable. You should regard the receipt of such complaints as real opportunities to make friends and to remedy defects in your service, instead of taking offense thereat, as has unfortunately been the case too many times in the past. In that way you will earn and retain the good will of your public, and there will be no question about whether your advertising "pays."

Advertising, stripped to the bone, is simply telling your "store news" honestly, clearly and sincerely, and then making good on it. That means treating the customer well and satisfying him completely from the beginning to the end of his dealings with you. In short, it is the practical application of the Golden Rule. In recent years the "wiseheimers" in the advertising line have made much talk about "psychology," "appeal to the mind," and other vague and mysterious things, whereas really to any straight-thinking business person advertising should be as simple as the first three letters of the alphabet.

A Public Relations Department

By Frank Wert

Manager Public Relations Department, Mahoning & Shenango Railway & Light Company

THE PURPOSES OF *a Public Relations Department Are Explained by the Author, Also the Means Which Have Been Adopted for Improving the Relations Between the Company and Its Employees.*

THE Mahoning & Shenango Railway & Light Company of Youngstown, Ohio, has had a public relations department since Sept. 1, 1914, and we look upon its field as somewhat more comprehensive than a publicity department, as its scope includes a variety of activities all bearing upon the question of improving the relations of the company with the patrons. Some of these activities have been fairly well established, while others remain to be developed to their proper degree of usefulness. Prior to its organization, matters of publicity, advertising, complaints, etc., were cared for in departments whose other duties were too pressing for them always to give proper attention to these "side issues." Hence the department was organized and these matters placed under its jurisdiction, and other duties assigned to it from time to time as occasion arose.

The field covered by the department at present may be divided about as follows:

Publicity.—Supplying ten daily and several weekly newspapers with news facts about the company, its activities, accidents, etc., and in general affording a ready means for newspapers to obtain information and acting as the company's mouthpiece. All matters pertaining to the lay press, and largely to the technical press, are handled in or through this department.

Advertising.—Both commercial and "good-will." Comparatively little of the latter has been done, but opportunity is never lost to use the advertising columns of newspapers to announce and explain changes in schedules, routes, transfer privileges, fare collections, etc. More comprehensive use of newspaper space for "good-will" advertising is contemplated, the difficulty not being the subject matter for such advertisements, but rather the opportune time for establishing the precedent so as not to create the impression that the company "wants something," and therefore is "trying to be good." All contracts for advertising and, in a general way, all copy, especially if it touches on any question of policy, are under the jurisdiction of this department.

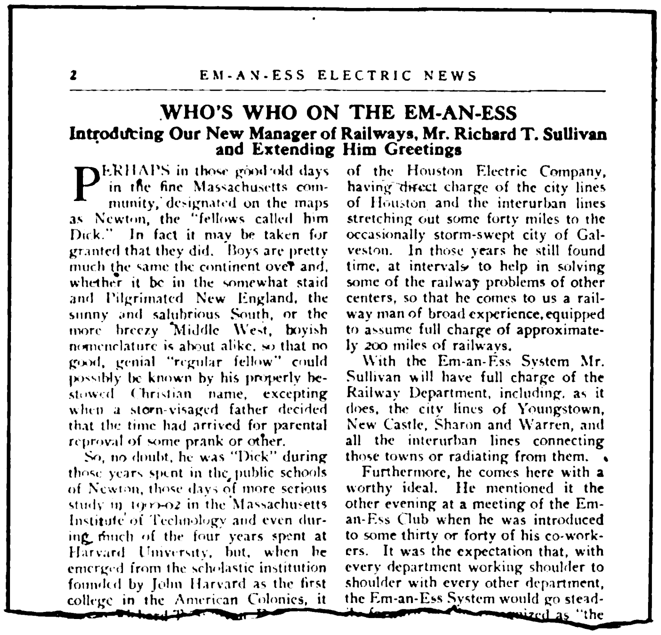
FRANK WERT

Bureau of Adjustments.—This is an adjunct to the department to which all patrons, railway or lighting, are invited to bring their grievances in order that the company may make reparation, may adjust or explain, as the case warrants. It is the medium through which the company seeks to meet the individual who feels that he has not been used fairly and to right speedily any wrong that exists. It is operated upon the basis that "the customer is right" until the contrary is proved, and that no matter complained of is too trivial for thorough investigation. This bureau has been in existence for one year and has handled more than 1500 cases. Many of these, of course, have been trivial, but some of them have disclosed conditions of operation which could be changed in such manner as to lead to the satisfaction of a large number of patrons who had not voiced their dissatisfaction. Very few absolute failures to satisfy the patron have resulted, though the number of those who remained resentful but silent cannot be estimated. Letters and personal expressions of satisfaction at the courtesy and fair dealing meted out by the bureau have been fairly numerous. Of course, the great bulk of complainants are never heard from, partly because their resentment vanishes after the first outburst and partly because a complaint adjusted becomes to them a closed incident not calling for any comment.

This bureau also handles the refunding of excess fares dropped into fare boxes, calls concerning outage of street lamps and some commercial lighting "trouble calls," and shortly it will take over the restoration to owners of articles found on the cars.

House Organ.—The *Em-an-Ess Electric News*, a monthly paper, 6 in. x 9 in., twenty-four pages and cover, is issued under the editorial direction of the manager of public relations. A part of a sample page of this little periodical is shown in the illustration below which indicates also one of the ways in which the opportunity for introducing a newcomer in the company ranks to the mass of employees is embraced by the publicity department.

The *Em-and-Ess Electric News* is distributed free to every employee and to a small number of persons outside the company. Its purposes are especially to promote courtesy toward patrons, the practice of safety in operation and co-operation among the various divisions of employees and, in general, to place before all employees the problems involving electric railway and power companies with a view to the promotion of better relations with the public. That is to say, the company feels that by homeopathic doses of educational effort the large number of employees who actually come into touch with the riding and light-buying public may gradually be turned from a liability of unsympathetic ignorance concerning the company into a decided asset through:



2 EM-AN-ESS ELECTRIC NEWS

WHO'S WHO ON THE EM-AN-ESS

Introducing Our New Manager of Railways, Mr. Richard T. Sullivan and Extending Him Greetings

PERHAPS in those good old days in the fine Massachusetts community, designated on the maps as Newton, the "fellows called him Dick." In fact it may be taken for granted that they did. Boys are pretty much the same the continent over and, whether it be in the somewhat staid and Pilgrimated New England, the sunny and salubrious South, or the more breezy Middle West, boyish nomenclature is about alike, so that no good, genial "regular fellow" could possibly be known by his properly bestowed Christian name, excepting when a stern-visaged father decided that the time had arrived for parental reproval of some prank or other.

So, no doubt, he was "Dick" during those years spent in the public schools of Newton, those days of more serious study in 1900-02 in the Massachusetts Institute of Technology and even during much of the four years spent at Harvard University, but, when he emerged from the scholastic institution founded by John Harvard as the first college in the American Colonies, it

of the Houston Electric Company, having direct charge of the city lines of Houston and the interurban lines stretching out some forty miles to the occasionally storm-swept city of Galveston. In those years he still found time, at intervals to help in solving some of the railway problems of other centers, so that he comes to us a railway man of broad experience, equipped to assume full charge of approximately 200 miles of railways.

With the Em-an-Ess System Mr. Sullivan will have full charge of the Railway Department, including, as it does, the city lines of Youngstown, New Castle, Sharon and Warren, and all the interurban lines connecting those towns or radiating from them.

Furthermore, he comes here with a worthy ideal. He mentioned it the other evening at a meeting of the Em-an-Ess Club when he was introduced to some thirty or forty of his co-workers. It was the expectation that, with every department working shoulder to shoulder with every other department, the Em-an-Ess System would go stead-

SAMPLE PAGE FROM "EM-AND-ESS ELECTRIC NEWS"

1. A growing appreciation of what is due to patrons (courtesy).

2. Improvement in the service rendered, and therefore a removal of many causes of friction between company and public (safety and efficiency).

3. An intelligent understanding of some of the more outstanding problems of public utilities (paving burdens, excessive taxation, service requirements beyond the earning capacities of lines, etc.), so that the employees may become advocates of fair treatment of the companies instead of joining in the chorus of unthinking criticism.

To insure reading by the employees in general and to gain sympathetic interest for the publication, one-third to one-half of the paper is devoted to personal news from all departments. Considerable space is also devoted to articles on changes in personnel, improvements made by the company, new equipment, history of various departments, biographical sketches of old employees, etc., while the more important educational efforts are kept from being so conspicuous as to alienate the interest of the great body of employees. Too much preaching leads to resentment.

It has also appeared to us that a good means of accomplishing the purposes sought in the paper is to publish from time to time cartoons representative of some general idea upon which may be based an editorial article of instructive value. For this purpose we have utilized cartoons published in the ELECTRIC RAILWAY JOURNAL, and we hope to print other cartoons in the same manner, believing that cartoons are a powerful means of pointing a moral.

In the Councils of the Company.—Under the organization plan of the company the heads of the main departments, such as the railway, light and power, accounting, treasury and claims, form a sort of cabinet for the president, and meet regularly every two weeks to discuss company problems. The manager of public relations is a member of this "cabinet," and his "portfolio" is that of "advocate of the people." He is included in this group for two purposes:

1. So that he may be informed concerning all important developments, a necessity for publicity work, and

2. That he may present objections to any proposal which, from his observation, would seem to be objectionable to the people. Sometimes this may lead to a project being abandoned or postponed till conditions change. More often it leads to modification to meet the wishes of the public. Still more frequently it results in a discussion of a proposal from many viewpoints and the determination upon a plan for presentation to the people so as to reduce to a minimum their opposition by clearly showing to them the benefits to them as well as to the company.

For essentially the same reasons the manager of public relations is a member of or attends meetings of various departmental organizations, the object always being to keep him fully informed of developments in the company and to insure due consideration of the wishes and needs of the public on the part of all executive and operating officials.

Questions of donations to charities and various other incidental matters go to complete the "tour of duty" for the department, so that there are few activities of the company that do not touch to some extent or other the public relations work.

ESSENTIAL TRUTHS OF PUBLIC RELATIONS

In conclusion I might say that I have read with interest the publicity and public relations editorials published for some weeks past in the ELECTRIC RAILWAY JOURNAL, and consider them exceptionally forceful and thoughtful expositions of the truths which must be accepted sooner or later by all public utilities, namely:

That publicity is a necessary part of public utility work.

That publicity must be free and frank, never so slightly tinged by press agency, and must be constant, considerate and progressive, if suspicion and misunderstanding, due to the silence and, in some instances, "gum-shoe" political methods of former years, are to be replaced by confidence and appreciation.

That education is needed not solely by the public, but just as much by the rank and file of employees, and, perhaps, even more particularly by the executives, boards of directors and stockholders, whose financial interests are bound up in the welfare of utilities.

Publicity Pays

By W. T. Waters

Publicity Manager Georgia Railway & Power Company, Atlanta, Ga.

PUBLICITY *Is Broad and Far-Visioned Advertising and Can Be of Material Assistance in Every Just Cause—The Editorials in the* ELECTRIC RAILWAY JOURNAL *Point the Way.*

I WONDER how many street railway bondholders and stock owners and directors and executives read those recent editorials in the ELECTRIC RAILWAY JOURNAL on publicity? And of those who did read them, how many soaked them in? Were they believed and taken to heart? Or were they forgotten forthwith as vain ideals, phrased by some publicity fanatic of more words than experience?

How much of their import went clear over the heads of the folks who say the yeas and nays of street railroading? That's the test. Did *they* get it? Did the series set them to thinking that perhaps after all some of this talk about the value of publicity is more than mere verbiage; that it points the way to some practical and desirable results—did they catch these truths?

If only a few of them did the JOURNAL has hastened measurably that day when publicity will be a real factor in electric railway affairs.

The JOURNAL'S editorials advanced many strong arguments. I should like to see them distilled to their epigrams and kept constantly before the men who make and break policies.

One of these was that corporation publicity is no press agent work; that the man to perform it must have "enough size and weight to make his superiors allow him to do the right thing in spite of their prejudices and previous habits." These are bold specifications, and radical—but right. Publicity under the old rules of repression would not be publicity at all.

And another was this: "The very fact that a company is trying by a frank policy of publicity to set itself right with the public inevitably leads its employees into the same attitude." This is one big result rarely included in the estimates.

"The kind of publicity that sticks its head in the sand never accomplishes very much," said another. In truth, it never accomplishes anything. It is not publicity.

"Successful publicity must concern itself with things about which the public is clamoring for information," for if it doesn't, the public will get misinformation about those same things, which is just what publicity must prevent.

"If explained as they arose, there would be few serious controversies between corporations and the public they serve." And if the explanations be started long before they arise there will be still fewer serious controversies.

"The best man to do the every-day cultivation of the newspapers is the publicity man." Because he knows just what sort of cultivating to do—which is the self-respecting sort that begs no favors and peddles no alms; and just how much—which is mighty little.

But I could keep on quoting till I reproduced the series.

A certain prolific syndicate writer who formerly was a minister has retained the wonderful faculty of discussing with an air of finality any subject under the sun. But recently he said something. He praised advertising (which is an integral part of publicity), because in it "business becomes vocal." Industry and organization, said he, "are dumb giants until they find speech—dumb and dangerous."

W. T. WATERS

"The telephone people are spending a deal of money talking to the public through the newspapers," he continued. "It is the wisest, shrewdest move a corporation ever made. Somebody in the telephone company had vision."

Then this: "Railroads, street cars, gas, electricity companies and similar forms of public utility are in a bad way. They complain that every man's hand is against them and that legislation is hostile. The cause of their plight is that they have not advertised properly. Even at this late day an intelligent program of advertising might save them. Without that, their days are numbered."

It may not be quite so bad as that; but, anyway, there's an outsider's suggestion. He happens to be an outsider whose writings are read (and believed in, to the last syllable) by a great many people in a number of cities.

Publicity ought to have become a well-marked line of activity among corporations when the early muckrakers put on paint and feathers.

But it was overlooked then, or deferred, or rejected, and therefore is all the more important now. The people have had their temporary fill of crusading and have constituted themselves into a vast jury with some growing sense of responsibilities. To win the verdict of this jury the corporation must employ publicity in all forms. And to do that effectively it must retain publicity counsel, just as it must retain legal counsel upon matters pertaining to courts of law. The public is not to be censured for the prejudiced verdict that is apt to follow if it hears nothing, either evidence or argument, from the utility's side of the court, or if what it hears from there is haltingly and weakly presented.

In the end public opinion is irresistible. It controls the legislative, administrative, executive and judicial departments of state and city. They are mere agencies and instruments of its will. Its recognition has got to be merited, and sought, and won.

The cause that is just need not fear this tribunal. True, human nature will retain its emotions, and to an extent can be swayed by them into prejudice. But, also, it will hold to its faculties of reasoning. By addressing itself to the average intelligence of the average man and woman, the utility will win that deserves to win.

Regardless of ifs and buts, however, utilities stand before the bar of public opinion whether in fear or in confidence. They're there, and they've got to make the best of it. They've got to plead their cause. They've got to employ publicity in some form, in some degree, and while they are about it they might as well use it fully and effectively.

Perhaps some indifference toward public opinion still survives here and there among utilities. Or perhaps the flayings they suffered in bygone years have left some controlling individuals raw to the touch even of balms and unguents. It may be some were burned so often and so cruelly by publicity in hostile hands that now the very sound of its name twangs their nerves anew.

Goodness knows these unfortunate gentlemen, if such there be, will find it easy to continue so by shrinking from publicity that is in their own behalf. Of course, they organize other defensive measures. Of course, they overlook no other detail. Yet they would forego this. They have not yet realized that to resist without it is but to temporize with the final issue. They may have their assailants licked to a frazzle on points, but unless the public knows it, what's the use in the end? Unless the lawyer convinces the jury, where does he get by having a better case than his opponent?

The fact that one has been seared by publicity's hot irons does not warrant his refusal of their defense in the hands of one who knows which end to pick them up by. Then he should be after enjoying the sights that hé can see. For publicity can be just as effective in defense as in aggression—much more so, in fact, if the aggression be ignoble.

The basic principles of publicity are not subject to challenge. They are cut in the stone. But their practice may be a matter of individual method. Right there the human equation enters. Different men may interpret controlling circumstances from different angles of understanding. On each must rest the responsibility of his own course.

For my part, I believe optional expediency never should govern when it compromises the principles of publicity. As to when expediency is optional and when not—there again enters the human equation. I think the situation is rare in which the honest utility can be compelled into surrender.

Voicing my own opinion still, I believe expediency is optional and that it compromises the far-seeing principles of publicity when it demands for the sake of temporary peace that some graft, polite or impolite, be countenanced. For instance, an artificial and superimposed advertising rate is assessed against a utility by some newspaper, as though its advertising were objectionable and to be penalized with that of clairvoyants and quacks and other fakers. Though this segregation is without excuse in conscience or reason in business, the newspaper has unquestioned privilege to declare it. But it has no right to coerce the utility into buying space at the spurious rate. Again, worthless or superfluous advertising is proffered with the intimation that the utility must buy. Both of these are dishonest practices. They and similar forms of blackmail will be tolerated no longer by any company from any quarter when those who own the utilities feel the courage of their moral position.

Again, it is my opinion that the time of all times for any corporation to press the accelerator on its publicity is when it is under attack. This opinion may be confronted by that of experienced electric railway men that the better course is to lie low and let public interest pass on. But would it do that any sooner? Public interest in a given topic endures just so long and no longer. Determined defense by a utility under fire will not prolong this interest unduly, but on the contrary may dissipate it by clarifying the issue and anticipating discussion. Moreover, if it has the public's good opinion, the utility stands to lose too large a measure of that by remaining silent under abuse. The time to convince the public mind is while that mind is open to what you have to say. Silence emboldens the pack to yap the harder, engenders the suspicion that there really is something up the tree and brings no end to anything.

"A lot of disappointments have been caused by the hiring of reporter press agents," said one of the JOURNAL'S editorials. Care should be taken, as the JOURNAL took it, to charge those disappointments against their true cause. By no means do they demonstrate the failure of publicity as a policy.

To attract the best men and hold them, publicity must be recognized by the utilities as a worthy and technical calling and must be compensated as such. To pay for reporter press-agent service and expect something of a higher order is unreasonable.

The field of utility publicity is broadening and begins to offer those further possibilities of progress which inspire effort. The demand is for workers who realize that the day of special pleading has passed and that specious defense is worse than none at all, who can retain the viewpoint of the critical outsider and address to his understanding and acceptance the truths about public service.

But the mere securing of the right man and the mere designating of him with some entitlement—this is but the beginning of deliberate publicity. The name of the thing is not enough. The concession of the theory, the recognition of the policy accomplish little. Beyond and above these the fearless spirit of publicity has got to be there.

Publicity does pay. It is but advertising—broad and far-visioned advertising. All of us advertise, whether consciously or not. We bow to good taste in personal matters. We demand creditable business stationery and presentable offices. We pay commensurate rent for locations on good business streets. We spend money to keep our cars varnished and our windows washed. All this is advertising or publicity, and every cent we put into it is well invested. Every day of our lives we adhere to the credo that publicity judiciously advanced certainly pays.

As a cold, strict, absolutely calculating business proposition publicity pays not only in more zealous loyalty among employees and in fair treatment dictated by public esteem, but also in dollars and cents that flow from that loyalty and that esteem; in increased demand for whatever we have to sell, whether it be car rides or cabbages.

The electric railway that depends for its dividends on the fortunity that if people ride in street cars they must pay it their nickels is not only foolish and pathetically myopic, it is precariously near the edge of big trouble.

A whole lot of folks have a say-so in the conduct of every corporation, be it public or private. And that's the rub. They have many conflicting opinions. The convincing of their majority that publicity offers peace to their business souls and fair wages to their commercial investments is not a task that can be lightly disposed of.

Therefore it is that I wonder how many owners and creditors and managers read the JOURNAL'S editorials and absorbed them and were moved by them to determination upon action.

How many, and who?

It is an interesting question. The answer could foretell much of the to-morrow of public service by private capital.

Special Ideas in Publicity Work

By E. B. Atchley

Publicity Agent Kansas City Railways Company

TEXT: *"Whatsoever ye would have the people do unto you, do ye even so unto the people"—and it will be done.*

THIS is a little sermon—a little sermon on publicity—and it covers every publicity idea under the sun. The publicity department ought to be a flood of sunlight, diverging in all directions from the heart of every public service concern, enveloping all the people served.

But the heart of the corporation must be there, and the chief executive is the heart. That publicity department is unsuccessful which does not have standing back of it the right kind of a chief executive, for he, too, needs must have as thorough an understanding of human nature as the publicity department. In this the Kansas City Railways' publicity department is most fortunate.

Secretiveness has been the curse of public service corporations because secretiveness brought only the just condemnation of an interested public—no praise. The people want to be friendly, and they will be, save for a few meddlers, if they are taken into the corporation's confidence. The public will treat you as you treat the public, and present opportunities for good publicity work enabling the department to grasp these opportunities. That is keeping *ahead* of the procession!

Recently the Common Council of Rosedale, a suburb of Kansas City, protested against the cars in use by the Kansas City Railways, and adopted a resolution prohibiting their operation.

The controversy brought bitter words, and while the break was bridged temporarily, the bad feeling was not wholly removed. In a few weeks a movement started by Rosedale women for a big playground, and the Railways' publicity department was the first to give aid in pushing the movement. Cards were carried on the cars boosting the playground, while newspaper stories urging the people to help found their way into print from this department. While this work meant no financial return to the company it did mean a better feeling, and to-day the women of Rosedale sing the praises of the Railways. The Golden Rule did it!

Knowing that all Kansas City was interested in the November election, the Railways arranged with the light company for a system of signals to announce the results as soon as the telegraph brought the news. The newspapers took up the plan, carried stories on it from day to day, and it was talked everywhere. The plan was carried out, with the result that everybody on the cars, as well as the people who remained at home, knew who had won as quickly as the people who watched the bulletin boards. Everybody was pleased.

Space has been given on the front of the cars in the last few months to promote public welfare, church, school and hospital work to show the Railways is interested and willing to aid in promoting any movement for the public good. Undoubtedly the assistance given these measures has aided the Railways materially in its efforts to relieve traffic congestion, for the organizations boosted have, in turn, fought for better traffic regulations on the part of the city. In some of this work the publicity department has gone outside its regular duties to assist in the preparation of newspaper stories, but everything done has been productive of splendid results.

E. B. ATCHLEY

Kansas City inaugurated a "health week" early in December, holding big meetings in Convention Hall, where a "health evangelist" exhorted his hearers to live up to the health rules laid down. The railways joined in the movement, helped in the newspaper publicity work, placed cards on the front of the cars calling attention to the meetings and prepared health literature for distribution on the cars. Every health advocate in the city talked about what the Railways was doing—and he liked it. The Railways did for the health advocate what it would like the health advocate to do for it under similar circumstances, and it naturally brought good will. Isn't this the object of a publicity department?

The safety work inaugurated by the Railways publicity department has been thoroughly "covered" in the ELECTRIC RAILWAY JOURNAL, but in the few months it has been carried on the work has developed wonderfully. Safety patrols have been established by all schools, essays are written by pupils, and the various local school publications carry articles on safety. These things followed the work of the safety director carried on in the schools, but they also indicated co-operation as a result of the publicity department having taken a part in pushing school athletics, evidencing more strongly the biblical truth.

Just one more word about building good will in a special manner. When the national encampment of the Grand Army of the Republic was held in Kansas City last August, this department issued a small daily newspaper called "The G. A. R. Edition" of *The Railwayan*, this being the title of the company's magazine for its employees, which carried all official news of the encampment and 20,000 copies of which were distributed free each day. Everybody interested in that encampment clamored for recognition in that little newspaper. It was made the official organ, and resolutions were adopted indorsing, praising and proclaiming all the other necessary good will, friendship, etc. Thousands of visitors saved every copy, many wrote back for extra copies after they went home, congratulatory letters came in by the dozen, and that paper was the talk of the town. It simply made a big hit, and the 20,000 veterans went back to their homes declaring Kansas City had the best street railway system on earth, to which every employee of the company wholly agreed. The little newspaper did it!

And now a word about newspaper publicity. Hardly a day has gone by in the last ten months since the Railways established its publicity department that the newspapers have not carried favorable mention of the company. Of course, there has been criticism—some just, some unjust. When the criticism has been unjust it has always been regarded as an unintentional error, and so treated in discussing the matter with the newspapers, the man who wrote it never being blamed and no anger being displayed. Reporters from every paper in the city call daily at this office, being kept advised of the Railways plans, frequently a week in advance of the time of publication, and not one has violated the confidence. They are as careful not to violate a confidence as a company official. In the news submitted for publication no effort is made to boost the company, no facts are hidden. The truth is always told. In this manner the Railways' publicity department has established a feeling of confidence in the statements made. Every effort is made to be fair—and news is judged mainly from the viewpoint of the public and the newspaper man, not purely from the company's viewpoint. This, it is considered, is a vital matter in the publicity work. If the newspaper becomes convinced the publicity man is "coloring" news, all information coming from the department is regarded as "colored." As a result of the confidence established, when an accident is reported to police headquarters involving the Railways, almost the first step of the reporter "covering" it is to call this department. If the information is not at hand the department secures it, looks into every angle of it and supplies the details. The newspapers take the statements as true. Wishing to be dealt with fairly, the Railways deals with the newspapers fairly—and the plan has proved to be right in Kansas City.

Whatsoever ye would that any or all should do unto you, do ye even so unto them, is the great fundamental law, or idea, of publicity, o'ershadowing everything, reaching even unto your enemies. Opportunities will bring forth the lesser and more special ideas, differing as to localities and dependent wholly on the brain that directs the work. The flood of sunlight will loose itself.

"Straight-Talk" Publicity

By E. E. Soules

Manager Department of Publicity, Illinois Traction System

THE AUTHOR *Outlines the Policy of the Illinois Traction System, Which Is Invariably to Tell the Company's Story First Thereby Obviating the Necessity for Defensive Campaigns to Meet Popular Criticism Based on Misinformation.*

IF the illustrious David Harum had given the same thought to the psychology of public utility operation that he gave to horse trading it is almost a certainty that his advice would have been to "tell the truth about yourself—and tell it first."

Actual experience has convinced the operators of American public utilities that publicity, rightly used, is a valuable factor in producing and maintaining desirable relations with the public. As to the method to be used, it has been demonstrated that this is dependent in large measure upon local conditions. It is impossible to lay down a hard and fast set of publicity commandments that will apply to all properties. There are scores of publicity mediums, and the first duty of the executive who has under his direction the outlining of the publicity policy of his property is to pick the medium that will work to best advantage in his particular territory. Then follows the selection of method of appeal to be used through this medium.

It is possible, however, to form some conclusions from the experience of others, and the results of the publicity efforts and methods pursued by a company that has pioneered in public utility publicity should be of interest to the present-day public utility operator.

The Illinois Traction System, operating some 800 miles of interurban and city railway, with gas, electric and steam-heat plants in twenty-five cities in the Central West, was perhaps one of the first companies of its kind to establish a publicity department. The innovation was worked out and put into effect by H. E. Chubbuck, vice-president executive, and since 1909 the publicity department has been a fixture with this property.

The company started its publicity work at a time when part of its property was in the development stage. This is an advantage. During this period the management has a story to tell that is welcome in the community in which it intends to operate. The ordinary reader is interested in learning of the plans of a new enterprise. He likes to feel that he is being given advance information on a project that affects the prosperity and development of his particular neighborhood. If he is taken into the confidence of the company at the outset he is very likely to take a personal interest in the affairs of the company in years to come.

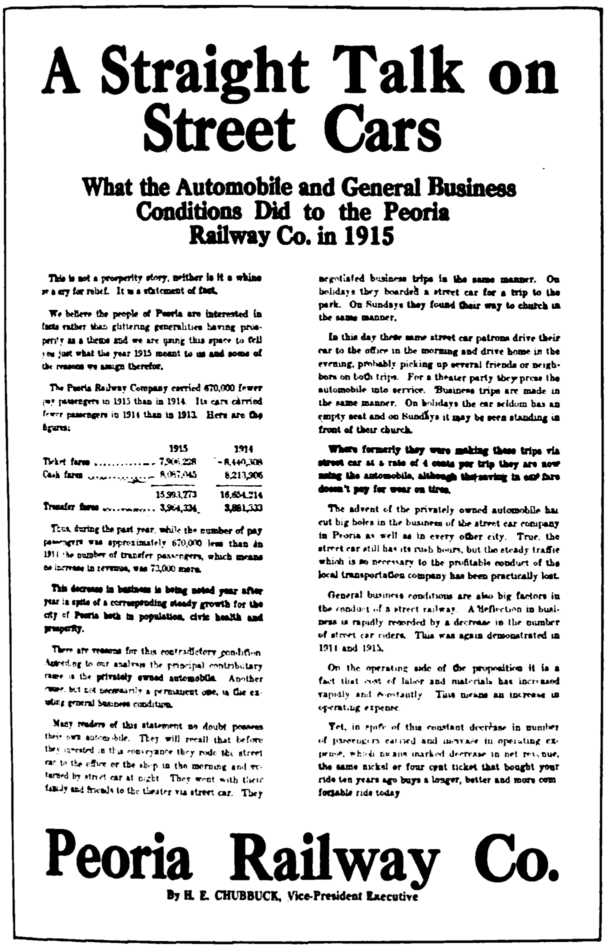
From the beginning the publicity policy of the Illinois Traction System has been based upon the use of the newspaper as a medium. For this reason the publicity department has been in charge from its inception of a man taken from the newspaper field. The original idea of co-operation between the management of the property and the newspapers has not been changed. It has been the aim of the company to constantly impress upon the mind of the publishers in its territory the idea that its publicity department is at their command at any and all times for the furnishing of any information that may be consistently given in regard to matters of public interest. It has not been the intention of the company to "work" the editorial or news rooms of the publications for free, or complimentary write-ups, nor to save on its advertising bills by "slipping in" editorial matter of an advertising nature.

However, instances of co-operation between the company and the editorial rooms of the newspapers appear in connection with accidents, wrecks, new extensions, purchasing of equipment, etc. In case of an accident it is the policy of the company to place every means for the securing of necessary information at the disposal of the newspaper man. Requests from the newspaper man for information on matters of news interest concerning the company's affairs receive immediate and careful attention. Another example of this kind of cooperation is the issuing of a "press sheet" at frequent intervals. This contains short news stories written in newspaper style so that they reach the news editor's desk in such shape that he can use a few or all of them at his own convenience and discretion. This news sheet is mimeographed and mailed to a list of all publications in the territory.

The publicity department is not used to keep the newspaper man out of the office of the executive officials.

The door of the highest official is always open to the newspaper man with a legitimate request for facts. Nor is the department used for the suppression of bad news. The policy of the company is to give the newspaper man the bad news along with the good and to ask only in return an even break on editorial comment or news "position."

When the company has a story to tell that deals with a question of public policy it buys and pays for sufficient space in the newspapers to tell it. Its policy is to place this display advertising copy with all newspapers in the territory affected, regardless of the editorial policy of the paper. It considers the avoidance of hostile newspapers as a short-sighted policy. Equal space is usually placed with all newspapers regardless of editorial opinion.



A Straight Talk on Street Cars

What the Automobile and General Business Conditions Did to the Peoria Railway Co. in 1915

This is not a prosperity story, neither is it a whine or a cry for relief. It is a statement of fact.

We believe the people of Peoria are interested in facts rather than glittering generalities having prosperity as a theme and we are using this space to tell you just what the year 1915 meant to us and some of the reasons we assign therefor.

The Peoria Railway Company carried 670,000 fewer pay passengers in 1915 than in 1914. Its cars carried fewer passengers in 1914 than in 1913. Here are the figures:

	1915	1914
Ticket fares	7,906,228	8,440,308
Cash fares	8,087,045	8,213,906
	15,993,273	16,654,214
Transfer fares	3,964,334	3,881,333

Thus, during the past year, while the number of pay passengers was approximately 670,000 less than in 1914 the number of transfer passengers, which means no increase in revenue, was 73,000 more.

This decrease in business is being noted year after year in spite of a corresponding steady growth for the city of Peoria both in population, civic health and prosperity.

There are reasons for this contradictory condition. According to our analysis the principal contributary cause is the privately owned automobile. Another cause, but not necessarily a permanent one, is the existing general business condition.

Many readers of this statement no doubt possess their own automobile. They will recall that before they invested in this conveyance they rode the street car to the office or the shop in the morning and returned by street car at night. They went with their family and friends to the theater via street car. They negotiated business trips in the same manner. On holidays they boarded a street car for a trip to the park. On Sundays they found their way to church in the same manner.

In this day these same street car patrons drive their car to the office in the morning and drive home in the evening, probably picking up several friends or neighbors on both trips. For a theater party they press the automobile into service. Business trips are made in the same manner. On holidays the car seldom has an empty seat and on Sundays it may be seen standing in front of their church.

Where formerly they were making these trips via street car at a rate of 4 cents per trip they are now using the automobile, although the saving in car fare doesn't pay for wear on tires.

The advent of the privately owned automobile has cut big holes in the business of the street car company in Peoria as well as in every other city. True, the street car still has its rush hours, but the steady traffic which is so necessary to the profitable conduct of the local transportation company has been practically lost.

General business conditions are also big factors in the conduct of a street railway. A deflection in business is rapidly recorded by a decrease in the number of street car riders. This was again demonstrated in 1914 and 1915.

On the operating side of the proposition it is a fact that cost of labor and materials has increased rapidly and constantly. This means an increase in operating expense.

Yet, in spite of this constant decrease in number of passengers carried and increase in operating expense, which means marked decrease in net revenue, the same nickel or four cent ticket that bought your ride ten years ago buys a longer, better and more comfortable ride today

Peoria Railway Co.

By H. E. CHUBBUCK, Vice-President Executive

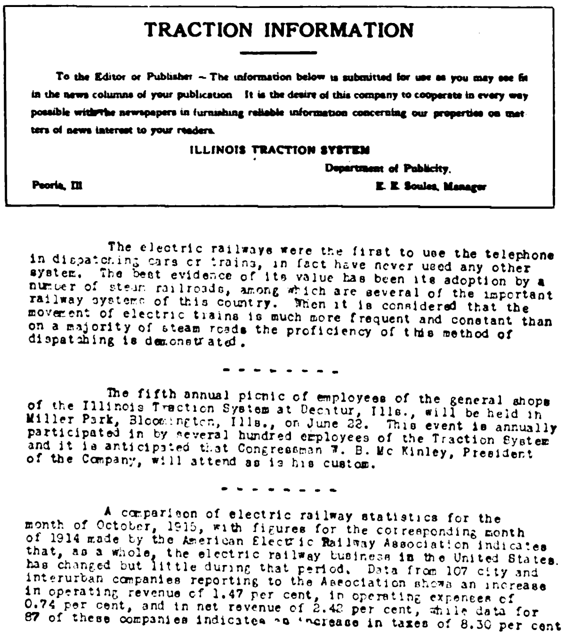
ILLINOIS TRACTION SYSTEM PUBLICITY—A "STRAIGHT TALK" ABOUT THE AUTOMOBILE

TYPICAL "STRAIGHT TALKS"

Different styles of copy have been used in different cities, the actual method of appeal depending upon local conditions. For instance, on one property a series of "Straight Talks on Street Cars" was used in which the problems of the local street car company were set forth. In another city "Plain Talks About the McKinley Company in Your City" were carried on, the copy dealing with the conditions under which the gas and electric company operated in that community. In another city the affairs of the company were set forth in opposing a municipal ownership bond issue; while in still another the advertising columns of the newspaper were used to explain reasons for and conditions under which the company intended to appeal to the proper regulative body for an increase in tariff rates.

In all of the company's newspaper advertising it endeavors to place its message in words that will be understood by the average newspaper reader. It adopts the "heart-to-heart" attitude, with the human interest side of its story uppermost, at the same time maintaining the proper amount of dignity. Technical expressions are avoided, and in no instance is copy used that can be construed as antagonistic to individuals or classes. Especially is this true in cases such as a campaign against municipal ownership or some such propaganda where there is divided opinion in the public mind.

Personalities in company advertising are religiously avoided. The loss of dignity and broad-mindedness which should characterize the efforts of a public utility company is far greater from the use of personalities than any gain. The company endeavors to make statements rather than refute them. In other words, it endeavors to tell its story first, whether it be good or bad, rather than to spend space and money later denying or explaining statements of the opposition or the uninformed.



TRACTION INFORMATION

To the Editor or Publisher — The information below is submitted for use as you may see fit in the news columns of your publication It is the desire of this company to cooperate in every way possible with the newspapers in furnishing reliable information concerning our properties on matters of news interest to your readers.

ILLINOIS TRACTION SYSTEM
Department of Publicity.
Peoria, Ill
E. E. Soules, Manager

The electric railways were the first to use the telephone in dispatching cars or trains, in fact have never used any other system. The best evidence of its value has been its adoption by a number of steam railroads, among which are several of the important railway systems of this country. When it is considered that the movement of electric trains is much more frequent and constant than on a majority of steam roads the proficiency of this method of dispatching is demonstrated.

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The fifth annual picnic of employees of the general shops of the Illinois Traction System at Decatur, Ills., will be held in Miller Park, Bloomington, Ills., on June 22. This event is annually participated in by several hundred employees of the Traction System and it is anticipated that Congressman W. B. Mc Kinley, President of the Company, will attend as is his custom.

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A comparison of electric railway statistics for the month of October, 1915, with figures for the corresponding month of 1914 made by the American Electric Railway Association indicates that, as a whole, the electric railway business in the United States has changed but little during that period. Data from 107 city and interurban companies reporting to the Association shows an increase in operating revenue of 1.47 per cent, in operating expenses of 0.74 per cent, and in net revenue of 2.42 per cent, while data for 87 of these companies indicates an increase in taxes of 8.30 per cent

ILLINOIS TRACTION SYSTEM PUBLICITY—NEWS SHEET FURNISHED TO EDITORS AT FREQUENT INTERVALS

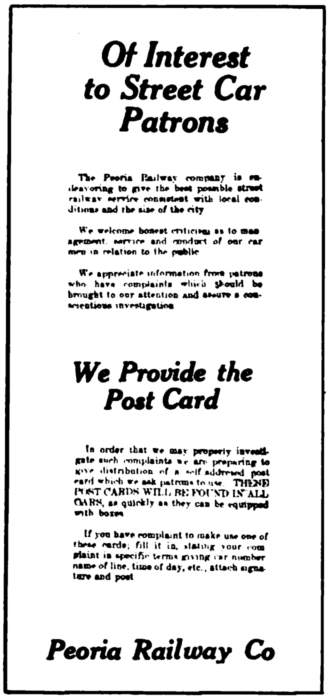
The company endeavors to get the thought to its patrons that it is doing the best it can in the way of furnishing adequate service. It does not claim in all cases that it is furnishing the best possible service, but that it is giving the best service possible under existing conditions. Where such conditions handicap the company an effort is made to explain them.

An example of "straight-talk" publicity used by this company is the full-page display copy which was used widely in the New Year and "Prosperity" editions of newspapers early in 1916. Where it has been customary for utility companies to patronize these "special editions" of newspapers with copy expressing the compliments of the season or pledging co-operation during the coming year, this company used copy showing what the privately owned automobile did to the local street-car company in the year previous. That this piece of copy produced results was evident from comment both from newspapers and individuals. At any rate, it is believed that it set some of its patrons thinking along constructive lines.

A typical series of "straight talks" used by this company for one of its local street railway properties at a time when no particular point was at issue, contained the following subjects:

In some cases this copy was illustrated with diagrams or halftone cuts, but for the most part the company depended upon the type alone for the telling of its story.

1—What One Car Traveling One Mile Earns in Peoria and Elsewhere.
2—You Can't Judge the Earning Capacity of a Street Car by the Load It Carries.
3—Your Nickel, and What Part of It the Street Railway Company Retains as a Profit.
4—The Investment of a Street Railway in City Pavement.
5—What a Crowded Car During the Rush Hour Does and Does Not Mean.
6—The High Cost of Living and Your Street Car Fare.
7—The Development of the Street Railway Track and What It Has Cost the Industry.



Of Interest to Street Car Patrons

The Peoria Railway company is endeavoring to give the best possible street railway service consistent with local conditions and the size of the city.

We welcome honest criticism as to management, service and conduct of our car men in relation to the public.

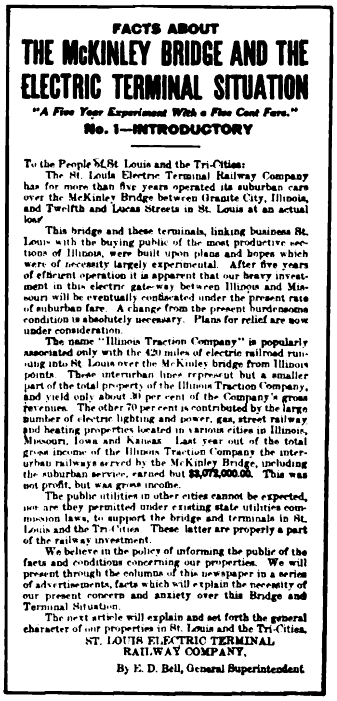
We appreciate information from patrons who have complaints which should be brought to our attention and assure a conscientious investigation.

We Provide the Post Card

In order that we may properly investigate such complaints we are preparing to give distribution of a self addressed post card which we ask patrons to use. THESE POST CARDS WILL BE FOUND IN ALL CARS, as quickly as they can be equipped with boxes.

If you have complaint to make use one of these cards; fill it in, stating your complaint in specific terms giving car number, name of line, time of day, etc., attach signature and post.

Peoria Railway Co



FACTS ABOUT

THE McKINLEY BRIDGE AND THE ELECTRIC TERMINAL SITUATION

"A Five Year Experiment With a Five Cent Fare."

No. 1—INTRODUCTORY

To the People of St. Louis and the Tri-Cities:

The St. Louis Electric Terminal Railway Company has for more than five years operated its suburban cars over the McKinley Bridge between Granite City, Illinois, and Twelfth and Lucas Streets in St. Louis at an actual loss.

This bridge and these terminals, linking business St. Louis with the buying public of the most productive sections of Illinois, were built upon plans and hopes which were of necessity largely experimental. After five years of efficient operation it is apparent that our heavy investment in this electric gate-way between Illinois and Missouri will be eventually confiscated under the present rate of suburban fare. A change from the present burdensome condition is absolutely necessary. Plans for relief are now under consideration.

The name "Illinois Traction Company" is popularly associated only with the 420 miles of electric railroad running into St. Louis over the McKinley bridge from Illinois points. These interurban lines represent but a smaller part of the total property of the Illinois Traction Company, and yield only about 30 per cent of the Company's gross revenues. The other 70 per cent is contributed by the large number of electric lighting and power, gas, street railway and heating properties located in various cities in Illinois, Missouri, Iowa and Kansas. Last year out of the total gross income of the Illinois Traction Company the interurban railways served by the McKinley Bridge, including the suburban service, earned but $3,072,000.00. This was not profit, but was gross income.

The public utilities in other cities cannot be expected, nor are they permitted under existing state utilities commission laws, to support the bridge and terminals in St. Louis and the Tri-Cities. These latter are properly a part of the railway investment.

We believe in the policy of informing the public of the facts and conditions concerning our properties. We will present through the columns of this newspaper in a series of advertisements, facts which will explain the necessity of our present concern and anxiety over this Bridge and Terminal Situation.

The next article will explain and set forth the general character of our properties in St. Louis and the Tri-Cities.

ST. LOUIS ELECTRIC TERMINAL
RAILWAY COMPANY,

By E. D. Bell, General Superintendent

ILLINOIS TRACTION SYSTEM PUBLICITY—ADVERTISEMENT FOR COMPLAINT CAMPAIGN; TELLING THE COMPANY'S STORY FIRST

8—The Street Car You Rode in Then; the One You Ride in Now, and What Your Ride Costs.
9—How the Cost of Street Railway "Overhead" has Advanced with the Times.
10—Your Street Railway Company as an Employer of Labor.
11—Twenty-One Million People Rode in Safety on Peoria Street Cars Last Year.
12—What the Peoria Railway Company Pays for Use of the Streets.

Supplementing these general publicity campaigns are special campaigns on subjects of public interest. For example, at the outset of the jitney invasion the company presented its side of the problem through "straight talks" in newspapers in the cities principally affected by the invader. Typical pieces of copy on this subject were:

1—A Preliminary Chat on Street Railway Finance and the Jitney Bus.
2—Your Street Railway and the So-Called Jitney Bus—A Comparison.
3—Think of Safety When Choosing Between the Street Car and the Jitney Bus.
4—A Nine-Mile Street Car Ride for the Cost of a Three-Mile Jitney Bus Ride.
5—Jitney Comfort and Jitney Immorality—A Comparison with the Street Car.
6—What the Street Railway Company Pays for the Use of the Streets—A Comparison with the Jitney Bus.
7—The Jitney Bus Ruling and What It Really Means.
8—The Street Car, the Jitney Bus and the Working Man.

In presenting the case of the jitney bus the company did not endeavor to make the point that the jitney was all bad and the street car all good. Rather, it was held that there was, perhaps, a place for the jitney bus but that, if allowed to compete on equal footing with the street car, it should be willing to submit to equal regulation. Also, it was pointed out that the street car offered added conveniences for the same money, such as universal transfers, safety and comfort.

The company has used this style of copy on several occasions when proposed municipally owned plants threatened confiscation of its own local properties. It is in such campaigns that the difficulty of keeping away from personalities with individuals or factions is encountered. And it is especially desirable in this kind of campaign, the company has found, to tell its story first, to stay on the offensive rather than the defensive, to deal absolutely with facts and to induce the people to believe in the management. Circulars and other methods of publicity have been used in these campaigns, but the newspaper advertising campaign has been the nucleus about which all the rest has been built.

The company feels that its publicity efforts have been well rewarded in these campaigns, and in a majority of cases the vote of the people has expressed their confidence in the company and its cause.

A COMPLAINT CAMPAIGN

Appreciating the fact that the public is entitled to have personal attention given its complaints, this company inaugurated a "complaint campaign" on one of its local street railway properties which met with considerable success. Boxes placed in all city cars contained a supply of return post cards with a message from the company inviting complaints from patrons as to the management, service and conduct of trainmen and asking for suggestions. Ample space was provided for writing the complaint, and the only requirement was that the card should be signed with name and address of the complainant.

Newspaper space was liberally used in calling attention to this request for complaints, and during each of the first two or three weeks about 100 complaints and suggestions were received. Each communication as received was given attention by the local superintendent, and a personal letter of acknowledgment was written to the complainant. In many cases suggestions were adopted, and when this was the case the complainant or suggestor was courteously thanked for his interest. Where it was impossible to adopt suggestions a special effort was made to explain the reason.

After a few weeks the number of complaints gradually decreased. The patrons of the company who had suggestions stored away for several years past had evidently been satisfied by this personal attention and ceased making complaint when they learned that the company evinced a real interest and was making an honest effort to comply with the wishes of its patrons to the best of its ability.

In conclusion, it may be said that the Illinois Traction System has not solved all of its problems through use of publicity. It is still misunderstood, as are many other utility companies in many questions of public interest. Some of its efforts to present its cause have seemed to fail. But its officials believe that it enjoys much good will and has a better standing in the communities in which it operates by reason of frank and honest presentation of its side of questions of public interest.

Street Railway Advertising:

When, How and Why

By Frank Putnam
The Milwaukee Electric Railway & Light Company

THE OBJECTS *of Such Advertising Should Be to Secure Increased Patronage, Fair Play from City and State Regulating and Taxing Agencies, and the Friendship of the Public—Advertisements Should Appear Continuously, not Spasmodically.*

THIS comment applies specifically to street railways operating under state regulation of capital, value, earnings, service, rates, accounting, etc. In part it may apply also to street railways operating under city regulation, or none. It is based upon somewhat more than twenty years' study of the business from the outside, as an active advocate of municipal ownership, and upon somewhat less than two years' study of the business from the inside, as an advocate of company ownership under state regulation.

When I advocated municipal ownership, I did so believing the surplus earnings of the business should go into the city treasuries, to support non-productive municipal services. I believed municipal ownership was the only way the public could get a fair share of its carfare spent for car service and the only way that the corrupt jobbing of franchises and the dishonest flotation of watered securities could be stopped.

To-day I advocate company ownership, under state regulation, because I have learned that under state regulation "there ain't going to be no core to this apple"—no surplus profits to be used for any other purpose, because it is apparent that State regulation is a surer and better way than city ownership to get a fair share of the carfare spent for car service, because under state regulation franchises no longer have any value except for taxing purposes, and because under state regulation the flotation of watered securities is impossible.

The public has got the results it wanted, but by another route than the one we early advocates of municipal ownership advised it to travel.

Some of my Socialist friends, who believe in the public ownership of all property because they believe in it, and some of my practical politician friends, who are able to visualize the fat pickings that would be made available under city ownership and political control of street railway payrolls, stubbornly declare state regulation of the business to be a failure. From their point of view it is a failure.

Some street railway operators, I suspect, harbor the idea that in the long run they will be able to "regulate the regulators."

They won't. They're dreaming. The state street railway regulators are on the public payroll. Here and there one of them may temporarily lean to mercy's side, so to say, but as a rule and in the long run they are going to give the public the big half of the apple.

State regulation has made good in some of the states. It will make good in all. It establishes company ownership and operation of street railways on a public service basis—the only tolerable basis from the public's viewpoint—the public through its own agencies saying what kind and amount of car service it wants and assuring the company owners a fair rental return on the cost of providing such service and not a penny more.

FRANK PUTNAM

If any street railway company is not satisfied with that prospect under state regulation, it can either sell out while the selling is good or it can encourage the gradual confiscation of its property by cultivating a chronic grouch and fighting its job.

My brief comment on street railway advertising, now to be written, is addressed to street railway investors and operators who are satisfied with that prospect.

Street railway companies should advertise to get two results chiefly: (*a*) Increased patronage; (*b*) fair play from city and state regulating and taxing agencies, and public friendship.

Advertising for increased patronage should be continuous—every day in the year—straight sales advertising. The riding habit, like any other, can be encouraged by apt suggestions, varied and repeated daily—just as the buying habit has been increased tenfold within a generation.

Public relations advertising should be used to make the public acquainted with all facts regarding the street railway service that the citizen gets as a matter of right regarding his city owned and operated services. Under state regulation the street railway company is only a group of citizens chartered to perform a public service for a going wage to the capital and labor required by that service. The public has an unquestioned right to know as much about this public service as about any other. It is to the interest of a street railway company that is conforming to the letter and spirit of state regulation to have the public know all about it. Possessing this knowledge, the public won't listen to unjust attacks upon the company. Nobody—either predatory politicians or sensational newspapers or even the Socialist agitators—will dare make unjust attacks upon the company when the public knows all the facts in the case.

If state rate regulators fix fares and hauls on a losing basis, so that the company can't earn on its officially determined earning value the fair return which state regulation generally has indicated to be necessary to maintain sound credit and give good service, the company's best recourse is an appeal straight to the public in newspaper advertisements. The American people are on the square. They don't want anybody's property confiscated. They won't have it done in their name if they know it. The exceptions to this rule nowhere form more than a noisy minority.

Street railway companies, approaching this task of establishing friendlier relations with the public by means of publicity, must bear in mind that the public as a whole is not yet habited to the idea that state regulation has stopped stock watering, franchise jobbing and excessive dividends. The extraordinary change which state regulation has made in the relation of the utility companies to the public are but dimly understood by the average citizen. Some of the facts which every street railway company under state regulation needs to fix in the public mind are these:

1. That a franchise no longer has any earning value or any sale value; in a word, it is no longer a "special privilege"; has, in fact, no use except to serve as an excuse for levying an extra tax on street railway receipts.
2. That identical street railway service would cost at least as much—for plant, labor and interest on capital—under city as under company ownership, and that company management will invariably be more energetic and efficient, and almost invariably more economical, than political management.
3. That the company has no more interest in "playing politics" than the department stores; that it is ready and eager to provide any kind and quantity of car service the public wants, provided the public's regulating and taxing agencies will let it earn and keep, for that purpose, revenue sufficient to provide that kind and quantity of service, pay a fair rental return to its owners and maintain good wages and fair working conditions for its employees.

The public still vividly remembers its unpleasant sensations experienced during the pre-regulation period of street railway development. It is not more than dimly aware of the new status of the business under state regulation. The new generation of operators can't spend money to any better purpose than for making the new status thoroughly understood.

But if any company has any extra cards up its sleeve, if it still thinks it can "slip something over" on the public, if its hands are not clean and its closets scoured, it had better clean up before it announces the housewarming.

And as for insinuated bogus "news" publicity calculated to mislead the public, why, that's old stuff. The public is on. That gun kicks harder than it shoots. When a street railway company talks to its public to-day it should do the talking in display advertising space, preferably over the signature of a responsible official speaking for the company.

The old public prejudices against street railway companies were not established in a day or a year; they were the product of a good many years of cumulative dissatisfaction, part of it justified, part of it due to public ignorance of street railway limitations which operators didn't have the merchandising wisdom to remove, as they might have done.

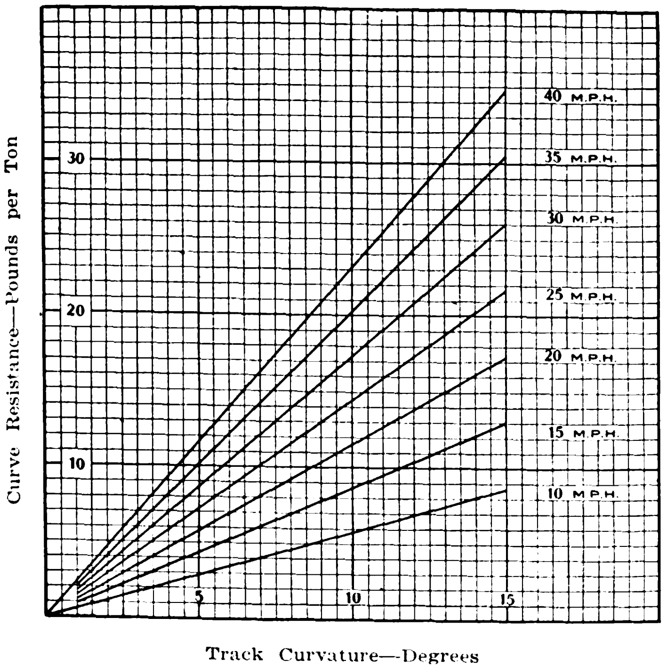
These prejudices can't be wiped out in a day or a year. The public sympathizes with a repentant sinner. Indeed, there is more joy in Zion over one black sheep that has repented than over ninety and nine whose feet have never slipped. But the public naturally wants time to make sure the repentance is genuine.

A Good Use for Safety Bulletins

The annual meeting of the Missouri Short Line safety committee was held in Liberty, Mo., on Dec. 19, 1916, fifty of the employees of the Kansas City, Clay County & St. Joseph Railway being present. Addresses were made by a pastor of the Disciples of Christ Church and a Catholic priest of Liberty, and by J. D. Bowersock, attorney for the road. R. S. Mahan, general passenger agent, who acted as toastmaster, had provided slips for each man on which had been written mottoes and statements concerning safety practices, culled by him from bulletins and publications of the National Safety Council. Most of the men, after reading the slips that had been handed to them, made short comments, relating experiences of the past few months and drawing lessons therefrom. Both of the ministers who spoke emphasized the importance of educating the public to proper practices while getting on and off cars, while on the cars, and while crossing the tracks. Both mentioned also the necessity of educating motor-car drivers in the means of avoiding collisions. J. R. Harrigan, general manager of the road, pointedly urged the men to be watchful of their own and others' safety.

Data on Car Resistance on Curves

Edward C. Schmidt, professor of railway engineering, University of Illinois, and H. H. Dunn, assistant in railway engineering, have recently published in the form of a University of Illinois Engineering Experiment Station Bulletin, No. 92, the results of tests of tractive resistance of a 28-ton electric car on curves. This is the test car which has been owned by the university for a number of years. It has a body 45 ft. long, trucks with 6 1/3-ft. wheelbase placed on 23¼-ft. centers, and four 50-hp. motors. The tests were made on track laid with 70-lb. T-rail on ties spaced on 24-in. centers, with super-elevation of the outer rail on curves varying from 0.75 in. on a 2-deg. curve to 5.9 in. on a 14½-deg. curve.



RELATION OF CURVE RESISTANCE AND CURVATURE AT VARIOUS SPEEDS, FROM UNIVERSITY OF ILLINOIS TESTS

The results of the tests are expressed in the formula:

$$R_c = 0.058\ S\ C,$$

where R_c is the curve resistance in pounds per ton, S is the speed in miles per hour, and C is the degrees curvature. The results are also shown in the report in graphical form as in the accompanying sample diagram.

Full data of the tests are given in the bulletin, which can be obtained from the experiment station at a price of 25 cents per copy. In the introduction to the bulletin the authors acknowledge the assistance of the officers of the Illinois Traction System on which road the tests were made.

New Electric Rolling Stock for 1916

The Record of New Cars Ordered or Built in Railway Companies' Shops Shows a Total Approximating 3900—This Is a Marked Increase Over the Figures for Both 1914 and 1915, Which Is Mainly Due to the Large Number of New City Cars Purchased

THE annual compilation of figures covering new cars ordered by electric railways or built in electric railway companies' shops during the past year is shown in the table below. The railways represented in the figures own 97 per cent of all cars operated in the United States and Canada. From the total of 3942 it is apparent that the year, although by no means a banner one in car building, has seen a very distinct recovery from the low figures of 1915. Taken as a whole the figures are especially encouraging because of the large number of companies ordering cars, the total of 250 being about 50 per cent more than last year.

The following summary shows the record in condensed form since the year 1907, and classifies the cars according to the various services for which they were purchased. In this summary, of course, certain arbitrary dispositions have had to be made in special cases. Subway and elevated cars are considered as city equipments, as are also all storage-battery cars. Cars intended for use on suburban lines or for operation indiscriminately in city and interurban service have been classified as interurban equipment. Express cars, electric lomotives, funeral cars, freight cars and line and work cars of all kinds have been placed in the miscellaneous column.

Year	City Cars	Interurban Cars	Freight and Misc. Cars	Total
1907	3,483	1,327	1,406	6,216
1908	2,208	727	176	3,111
1909	2,537	1,245	1,175	4 957
1910	3,571	990	820	5,381
1911	2,884	626	605	4,015
1912	4,531	783	687	6,001
1913	3,820	547	1,147	5,514
1914	2,147	384	479	3,010
1915	2 072	336	374	2,782
1916	3,046	374	522	3,942

Special features of the statistics appear in connection with the number of electric locomotives ordered, which was 31, as compared with 43 ordered in 1915. The number of cars of all classes built in company shops was 445, thus showing a sudden increase when opposed to the figures of 165 in 1915 and 228 in 1914. A decrease took place in the number of gasoline-driven cars of all kinds. On the other hand, the number of one-man cars purchased during 1916 was materially greater than in 1915, the respective totals being 187 and seventy-seven. Purchases of automobiles and automobile trucks also displayed an increase. These figures are respectively twenty-nine and ten, but they have not been included in the lists of rolling stock.

The list of passenger cars is virtually divided between semi-steel and all-steel cars, showing a remarkable growth of popularity for the latter type of construction. Trail cars, however, have definitely lost popularity, since the lists include only seventy-one interurban trailers and 128 city trailers. The same thing applies to open cars of which only 131 were purchased and even this number is affected by the large single order of 127 constructed by the Public Service Railway of New Jersey in its shops. Of semi-convertible cars there were a total of 379, an insignificant number of fully-convertible cars being included in this figure.

In the lists below, space limits have necessitated certain arbitrary usages. All cars not specifically marked as trail cars may be considered to be equipped with motors. The classification of freight cars includes all gondola, box, flat and hopper bottom designs that are used to handle bulk freight. Cars less than 35 ft. long are marked to show one-man or two-man operation, and it is to be understood that cars longer than this are operated with two men. In connection with construction the term "all" refers to all-steel designs that have steel framing throughout, while the term "semi" applies to cars with steel carried only as high as the belt rail. Since practically none of the cars ordered during the year is of fully convertible type, the term "conv." has been used to indicate semi-convertible as well as convertible cars.

Railway	*Number*	*Type*	*Overall Length*	*Service*	*Construction*	*One-man?*
Aberdeen R. R	2	Psr. Cl.	26	City	Semi	One
Albany Tr. Co	1	Psr. Cl.	32	City	All	One
Albia Lt. & Ry	2	Psr. Cl.	33	City	Wood	Two
Alton, Granite & St. L. Tr. Co.	3	Psr. Cl.	54	Int.	All	..
Altoona & Logan Valley Ry	5	Psr. Cl.	41	City	All	..
Anaconda Copper Mining Co.	2	Psr. Cl.	53	City	Wood	..
	1	Psr. Trail	47	City	Wood	
Appalachian Pr. Co.	1	Psr. Cl.	33	City	All	Two
Arkansas Valley Int. Ry	1	Psr. Cl.	56	Int.	Semi	..
	1	Exp.	50	Int.	Semi	..
Asheville Pr. & Lt. Co	6	Psr. Conv.	35	City	Wood	Two
Atchison Ry., Lt. & Pr. Co	3	Psr. Cl.	30	City	All	One
Aurora, Elgin & Chi. R. R	4	Psr. Cl.	42	City	Semi	..
Austin St. Ry	4	Psr. Cl.	30	City	All	One
Bangor Ry. & Elec. Co	3	Psr. Conv.	43	Int.	All	..
	3	Psr. Cl.	33	City	Semi	Two
Bay State St. Ry	200	Psr. Conv.	43	City	Semi	Two
	7	Exp.	40	..	Semi	..
	5	Frt.	40	..	Wood	..
Beaumont Tr. Co	7	Psr. Cl.	27	City	All	Two
Benton Harbor-St. Joe Ry	2	Psr. Cl.	39	City	All	Two
Berkshire St. Ry	4	Psr. Conv.	43	City	Semi	..
Binghamton Ry	16	Psr. Cl.	31	City	All	Two
Boston & Maine R. R	2	Loco. 130 ton	..	..	..	..
Boston Elevated Ry	42	Psr. Cl.	47	Elev.	Semi	..
	100	Psr. Cl.	49	City	Semi	..
	2	Frt.	39	..	All	..
	10	Psr. Cl.	48	City	Semi	..
	50	Psr. Trail	48	City	Semi	..
	2	Work	47	..	Semi	..
Bristol & Plainville Tr. Co	3	Psr. Cl.	39	City	Semi	..
Buffalo & Depew Ry	1	Work	28	..	..	..
Buffalo & Lake Erie Tr. Co	30	Psr. Cl.	45	City	All	..
	1	Sweeper				
Buffalo, Lockport & Rochester	1	Exp	54	Int.	All	..
Burlington County Tr. Co	2	Psr. Conv.	41	Int.	Semi	..
Burlington Trac. Co	1	Psr. Cl.	44	City	Semi	..
Butte, Anaconda & Pacific Ry	6	Locos. 80 ton		..	..	..
Butte Elec. Ry	4	Psr. Open	46	City	Semi	
	5	Psr. Cl.	41	City	All	..
Centralia Trac. Co	2	Psr. Cl.	32	Both	All	Two
Chambersb'g, G'nc'sle & W'boro Ry	2	Psr. Conv.	47	Int.	Semi	..
	1	Line	34	..	..	..
Charleston Interurban R. R	2	Psr. Cl.	47	Int.	All	..
	1	Exp	45	..	Semi	..
Chattanooga Trac. Co	2	Psr. & Bagg.	46	Int.	All	..
Chicago & Interurban Tr. Co	1	Psr. Cl.	48	Int.	..	..
Chicago, Lake Shore & So. Bend Ry	2	Locos. 72 tons		..	..	..
	18	Frt. Trail	44	..	..	..
Chicago, No. Shore & Mil. R. R	5	Psr. Cl.	54	Int.	Semi	..
	7	Psr. & Exp.	54	Int.	Semi	..
	3	Dining	54	Int.	Semi	..
Chicago, So. Bend & No. Ind. Ry	5	Psr. Cl.	38	City	All	..
Chicago Surface Lines	10	Psr. Cl.	48	City	Semi	
Chicago & West Towns Ry	5	Psr. Cl.	46	City	All	..
Cincinnati, Newport & Cov'gt'n	25	Psr. Cl.	45	City	All	
	2	Sweeper	28	..	..	..
Cincinnati Traction Co	100	Psr. Cl.	44	City	Semi	..
Citizens' Ry. Co	2	Psr. Cl.	30	City	All	One
City Elec. Co., Albuquerque, N. M	5	Prs Cl	28	City	Semi	One
City Lt. & Tr. Co., Sedalia, Mo	8	Psr. Cl.	29	City	Semi	One
City Ry., Dayton, O	10	Psr. Cl.	43	City	All	..
Clev. All'nce & M'h'n'g V'y R. R	2	Psr. Cl.	55	Int.	All	..
	6	Frt. Trail	50	..	Semi	..
Cleveland, Painesv'le & E'st'n R. R.	1	Exp.	50	..	Wood	..
Cleveland Ry Co	25	Psr. Cl.	51	City	Semi	..
	25	Trail	49	City	Semi	..
	1	Sweeper	..	..	..	..
Cleveland Southw'n & Col. Ry	6	Psr. Cl.	62	Int.	All	..
Columbus Ry., Lt. & Pr. Co	5	Psr. Cl.	36	City	Semi	One

Railway	*Number*	*Type*	*Overall Length*	*Service*	*Construction*	*One-Man?*
Conestoga Trac. Co	1	Psr. Cl.	43	Sub.	Semi	..
	3	Psr. Cl.	38	City	Semi	..
	1	Frt.	..	..	..	..
Connecticut Co	60	Psr. Conv.	49	City	Semi	..
	30	Psr. Conv.	43	City	Semi	..
	10	Psr. Conv.	46	Both	Semi	..
	1	Psr. Cl.	50	City	Wood	..
	4	Exp.	41	..	Wood	..
	4	Frt. Trail	42	..	Semi	..
	6	Frt. Trail	42	..	Wood	..
	1	Snow Plow	..	..	..	..
	1	Line	42	..	Wood	..
	1	Wrecker	42	..	Wood	..
Connecticut Valley Ry	1	Work	45	..	Wood	..
Corning & Painted Post Ry	4	Psr. Cl.	34	City	All	One
Cumberland County Pr. & Lt. Co	4	Psr. Conv.	36	City	Semi	..
Cumberland & West'p't Elec. Ry	5	Psr. Cl.	45	Int.	All	..
Dayton & Troy Ry	6	Frt.	50	Semi	..	..
Dayton, Springfield & Xenia Ry	2	Psr. Cl.	44	City	All	..
Des Moines City Ry	40	Psr. Cl.	45	City	Semi	..
	1	Loco.	30	..	..	..
	1	Line	40	..	Wood	..
	2	Work	40	..	Semi	..
Detroit United Ry	100	Trail	47	City	All	..
	8	Trail	54	Int.	Semi	..
	50	Psr. Cl.	47	City	All	..
	8	Psr. Cl.	54	Int.	Semi	..
	8	Psr. Cl.	58	Int.	Semi	..
	31	Frt. Trail	50	..	..	..
	30	Frt. Trail	40	..	..	..
	1	Work	48	..	..	..
	3	Line	..	..	..	..
	2	Express	50	..	..	..
Duluth St. Ry	8	Psr. Cl.	47	City	Wood	..
Durham Trac. Co	6	Psr. Cl.	31	City	All	One
	3	Psr. Cl.	26	City	All	One
East St. Louis & Sub'n Ry	50	Psr. Cl.	46	City	Semi	..
	3	Psr. Cl.	54	Int.	All	..
Eastern Pennsylvania Rys	2	Psr. Conv.	47	City	Semi	..
Easton Transit Co	6	Psr. Cl.	42	Int.	All	..
	1	Sweeper	31	..	..	..
Elmira Water, Lt. & R. R	5	Psr. Cl.	45	City	All	..
	3	Work	45	..	..	..
Escanaba Trac. Co	1	Psr. Cl.	34	City	All	One
Evanston Ry	3	Psr. Cl.	42	City	Semi	..
Fonda, Jonhstown & Gl v'le R. R	2	Psr. Cl.	33	City	All	Two
Fort Dodge, Des Moines & S'n R. R	1	Psr. Cl.	43	City	Semi	..
	2	Psr. Cl.	53	Int.	Semi	..
	1	Trail	50	Int.	Semi	..
Fort Wayne & Decatur Trac. Co	3	Psr. Cl.	49	Int.	Semi	..
	1	Exp.	40	..	Wood	..
Fort Wayne & N. Ind. Tr. Co	1	Sweeper	28	..	..	..
Fox & Illinois Union Ry	1	Exp.	50	..	Semi	..
Fresno Trac. Co	6	Psr. Cl.	30	City	Wood	..
Georgia Ry. & Pr. Co	6	Psr. Cl.	44	City	Semi	..
Grand Rapids Ry	15	Psr. Cl.	44	City	Semi	..
Grand Rapids, Grand Haven & Muskegon Ry	1	Psr. Cl.	53	Int.	Semi	..
	3	Exp.	50	..	Semi	..
	3	Exp.	48	..	Wood	..
Great Falls St. Ry	7	Psr. Cl.	40	City	All	..
Hagerstown & Frederick Ry	2	Trail	30	City	Wood	Two
Hammond, Whiting & E. Chi. Ry	4	Psr. Cl.	48	City	Semi	..
Harrisburg Rys	2	Psr. Cl.	44	Both	All	..
	3	Psr. Cl.	37	City	Semi	..
Hocking-Sunday Creek Tr. Co	1	Psr. Cl.	48	Int.	All	..
	1	Psr. Trail	45	Int.	All	..
Holyoke St. Ry	5	Psr. Cl.	42	City	Semi	..
	5	Psr. Cl.	44	City	Semi	..
	1	Sweeper	..	..	..	..
Hudson Valley Ry	3	Psr. Cl.	51	Int.	Wood	..
	1	Work	43	..	..	..
Hutchinson Inter-Urban Co	3	Psr. Cl.	28	City	Semi	One
Hydro-Elect. Pr. Com., Toronto, Can	3	Psr. Cl.	50	Int.	Wood	..
Illinois Northern Utilities Co	1	Psr. Cl.	32	City	Semi	One
Illinois Trac. System	101	Frt. Trail	40	..	..	..
	40	Frt. Trail	42	..	..	..
	60	Frt. Trail	36	..	..	..
	1	Sweeper	..	..	..	..
Indianapolis Trac. & Term. Co	25	Psr. Cl.	47	City	Semi	..
International Ry	20	Psr. Cl.	55	Int.	Semi	..
	7	Psr. Cl.	34	City	Semi	..
	2	Funeral				
Ironwood & Bessemer Ry	3	Psr. Cl.	28	City	Semi	One
Ithaca Trac. Corporation	1	Sweeper	28	..	..	..
Jackson (Miss.) Lt. & Trac. Co	2	Psr. Cl.	26	City	All	One
Jackson (Tenn.) Ry. & Lt. Co	2	Psr. Cl.	30	City	All	One
Jamestown St. Ry. Co	10	Psr. Cl.	42	City	All	..
Jamestown, Westfield & Nor. R. R	3	Psr. Cl.	62	Int.	All	..
	1	Psr. Trail	62	Int.	All	..
Jersey Central Trac. Co	3	Psr. Cl.	33	City	All	One
Johnstown Trac. Co	10	Psr. Cl.	40	City	Semi	..
Joplin & Pittsburgh Ry. Co	1	Exp.	45	..	Wood	..
Kankakee & Urbana Trac. Co	1	Exp.	51	..	Wood	..
	7	Frt.	36	..	Wood	..
Kankakee Elec. Ry	2	Psr. Cl.	27	City	Semi	One
Kansas City Rys	75	Psr. Cl.	44	City	Semi	..
Kansas City, Clay Co., & St. Jo. Ry	1	Loco.	..	..	..	..
Kansas City, Kaw Valley & W'n Ry	2	Locos.	..	..	..	..
Keokuk Elec. Co	1	Psr. Cl.	28	City	Semi	One
Lake Shore Elec. Ry	12	Psr. Cl.	60	Int.	All	..
	2	Exp.	..	..	All	..
Lehigh Valley Transit Co	12	Psr. Cl.	50	Both	All	..
Levis County Ry	2	Psr. Cl.	32	City	Semi	Both
Lewisburg & Ronceverte Ry	1	Psr. Cl.	39	Int.	All	..
Lewiston, Augusta & W'v'le St. Ry	2	Exp.	41	..	Semi	..
	1	Snow Plow	..	..	..	..
Lewiston-Clarkston Transit Co	3	Psr. Clsd.	28	City	Semi	One
London & Port Stanley Ry	2	Psr. Cl.	71	Int.	All	..
Long Island R. R	45	Psr. Trail	54	Int.	All	..
Lorain St. Ry	5	Psr. Cl.	50	City	All	..
Macon Ry. & Lt. Co	6	Psr. Cl.	30	City	Wood	..
Madison Rys	5	Psr. Cl.	33	City	Semi	..
Mahoning & Shenango Ry	10	Psr. Cl.	47	City	All	..
	10	Psr. Cl.	28	City	All	One
	4	Frt.	43	..	Semi	..
	1	Line	43	..	Semi	..
Manhattan & Queens Tr. Co	7	Psr. Cl.	43	City	All	..
	1	Sweeper	..	..	..	..
Massachusetts No'east'n Tr. Co	12	Psr. Conv.	42	Int.	Semi	..
Memphis & Rugby Ry	1	Psr. Cl.	27	City	Wood	..
Miami Tr. Co	2	St. Batt...	26	City	Wood	Two
Michigan Railway	2	Psr.Cl.	53	Int.	All	..
	8	Psr. Trail	53	Int.	All	..
	2	Express	..	...	All	..
	4	Psr. Cl.	61	Int.	All	..
	20	Psr. Cl.	40	City	Semi	..
Michigan United Rys	20	Psr. Cl.	41	City	Semi	..
Milwaukee Elec. Ry. & Lt. Co	50	Psr. Cl.	50	City	All	..
	1	Sweeper	..	..	..	..
Mississippi Valley Elect. Co	4	Psr. Cl.	26	City	Semi	One
Moline, Rock Island & E'st'n Tr. Co	1	Sweeper	..	..	..	..
Monongahela Valley Tr. Co	8	Psr. Cl.	29	City	Semi	Two
Monroe St. Ry	3	Psr. Cl.	29	City	Semi	One
Montgomery Lt. & Tr. Co	6	Psr. Cl.	31	City	All	Two
Montgomery Transit Co	3	Psr. Cl.	35	City	All	Both
Morris County Tr. Co	5	Psr. Cl.	48	Int.	All	..
	1	Sweeper	..	..	..	..
Municipal Ry., Alexandria, La	2	Psr. Cl.	32	City	All	Two
Murphysboro Elec. Ry	2	Psr. Cl.	43	Int.	All	..
Muskegon Tr. & Lt. Co	4	Psr. Cl.	45	City	All	..
Nashville (Tenn.) Int. Ry	1	Express	46	..	Semi	..
Nashville (Tenn.) Ry. & Lt	9	Psr. Cl.	42	City	..	..
New Bedford & Onset St. Ry	1	Line	..	..	..	..
New Jersey & Penna. Tr. Co	1	Baggage	23	..	..	..
Newport News & Hampton Ry	4	Psr. Cl.	35	City	All	Two
New York Central R. R	12	Psr. Cl.	70	Int.	All	..
	10	Locos. 100 ton	..	..	..	..
New York Municipal Ry	200	Psr. Cl.	67	Sbwy.	All	..
New York Railways	70	St. Batt.	29	City	Semi	Two
New York State Rys. (Rochester)	50	Psr. Cl.	50	City	All	..
	3	Dump	..	..	..	..
New York State Rys. (Syracuse)	25	Psr. Cl.	48	City	All	..
	1	Snow Plow	..	..	..	..
New York State Rys. (Utica)	12	Psr. Cl.	50	Int.	All	..
	10	Psr. Cl.	48	City	All	..
Niagara Junction Ry	1	Loco. 60 ton	..	..	..	..
North Carolina Pub. Serv. Co	6	Psr. Conv.	27	City	Semi	One
Northern Massachusetts St. Ry	1	Work	30	..	Wood	..
Northern Ohio Tr. & Lt. Co	15	Psr. Cl.	53	Int.	All	..
	25	Psr. Cl.	50	City	Semi	Two
	1	Express	60	..	Semi	..
Northern Texas Tr. Co	10	Psr. Cl.	28	City	Semi	One
Ogden, Logan & Idaho	3	Psr. Cl.	65	Int.	All	..
	3	Loco. 50-ton	..	..	..	..
	1	Loco. 30-ton	..	..	..	..
Oakwood St. Ry	5	Psr. Cl.	45	City	Semi	..
Ohio Elect. Ry	10	Frt. Trail	39	..	Wood	..
Ohio River Pass'g'r Ry	2	Psr. Trail	47	Int.	All	..
Oklahoma Ry	4	Psr. Cl.	56	Int.	All	..
	6	Psr. Cl.	44	City	Semi	..
	2	Exp. Trail	42	..	Wood	..
Omaha & Council Bluffs Ry	25	Psr. Cl.	42	City	Wood	..
Oshawa Ry	1	Loco.	23	..	..	..
Oskaloosa Tr. & Lt. Co	6	Psr. Cl.	30	City	All	One
Ottumwa Ry. & Lt. Co	5	Psr. Cl.	31	City	All	Both
Pekin Municipal St. Ry	2	Psr. Cl.	31	City	All	One
Pennsylvania R. R. (Elec. Div'n)	1	Sweeper	..	..	..	..
Peoples' Ry. of Dayton, O	10	Psr. Cl.	44	City	Semi	..
	10	Psr. Trail	42	..	Semi	..
	10	Psr. Trail	44	..	All	..
Piedmont & Northern	1	Psr. Cl.	27	City	..	One
Piedmont Ry. & Elect. Co	2	Psr. Cl.	26	City	All	One
Pittsburgh Rys	162	Psr. Cl.	45	City	All	..
	75	Psr. Trail	45	Ctiy	All	..
	4	Dump	..	..	..	..
Portsmouth Elect. Ry	1	Work	34	..	..	..
Pottstown & Phoenixville Ry	8	Psr. Conv.	52	Int.	All	..
Princeton Power Co	2	Psr. Cl.	43	Int.	All	..
Public Service R. R., Trenton	5	Psr. Cl.	47	Int.	Semi	..
Public Service Ry., Newark	127	Psr. Open	49	City	Semi	..
	50	Psr. Cl.	52	City	Semi	..
	20	Psr. Cl.	47	Int.	Semi	..
	10	Sweepers	28	..	..	..
Public Utilities Co	10	Psr. Cl.	41	City	Semi	..
	1	Frt.	34	..	..	..
Puget Sound Tr., Lt. & Pr. Co	1	Psr. Cl.	23	City	All	One
	8	Psr. Cl.	28	City	All	One
Quebec Ry., Lt. & Pr. Co	4	Psr. Cl.	40	City	Semi	..
	1	Sweeper	..	..	..	..
Reading Tr. & Lt. Co	15	Psr. Conv.	46	Int.	Semi	..
	13	Psr. Conv.	32	City	Semi	Both
	1	Dump	..	..	..	..
Regina Municipal Ry	1	Snow Plow	29	..	..	..
Rhode Island Co	50	Psr. Cl.	42	City	Semi	..
	7	Express	41	..	Wood	..
Richmond Lt. & R. R. Co	1	Dump	..	..	..	..
Rockland, Thomaston & Camden	1	Psr. Cl.	42	Int.	Semi	..
Rutland Ry., Lt. & Pr	1	Psr. Cl.	29	City	All	Two
St. Cloud Pub. Serv. Co	2	Psr. Cl.	34	City	Semi	One
Salem & Penns Grove	1	Express	28	..	Wood	..
Salt Lake & Ogden Ry	6	Psr. Trail	62	Int.	Semi	..
Salt Lake & Utah R. R	6	Psr. Cl.	61	Int.	All	..
	2	Locos. 50-ton	..	..	..	..
San Antonio Tr. Co	30	Psr. Cl.	35	City	All	Both
Sand Springs Ry	2	Psr. Cl.	58	Int.	All	..
	3	Frt. Trail	..	..	..	..
Sandwich, Windsor & Am'b'g Ry	2	Psr. Cl.	43	Int.	All	..
	2	Psr. Cl.	34	City	Wood	..
San Francisco-Oakland Term. Ry	20	Psr. Cl.	41	City	All	..
	12	Psr. Cl.	51	Int.	All	..
Schenectady Ry	6	Psr. Cl.	50	Int.	All	..
	10	Psr. Cl.	50	City	All	..
Schuylkill Ry	2	Psr. Cl.	37	City	Semi	..
	4	Psr. Cl.	42	City	Semi	..
Scranton & Binghamton Ry	2	Express	40	..	Wood	..
	1	Coal	40	..	..	..

Railway	*Number*	*Type*	*Overall Length*	*Service*	*Construction*	*One-Man?*
Scranton Ry	10	Psr. Cl.	46	City	Semi	..
Shore Line Elec. Ry	2	Frt. Trail	44	..	..	..
Sioux City Service Co	10	Psr. Cl.	39	City	Wood	..
Sioux Falls Tr. System	1	Psr. Cl.	30	City	Semi	Both
Slate Belt Elect. St. Ry	1	Frt.	50	..	..	..
Southern Cambria Ry. Co	2	Psr. Cl.	50	Int.	Wood	..
Southern Penna. Tr. Co	3	Psr. Conv.	41	City	Semi	..
Southern Pub. Utilities Co	6	Psr. Cl.	38	City	All	..
	6	Psr. Cl.	27	City	..	One
Southwest Missouri R. R	5	Psr. Cl.	44	Int.	Semi	..
Southwestern Interurban Ry	1	Psr. Cl.	28	City	All	Two
Springfield & Washington Ry	1	Psr. Cl.	49	Int.	All	..
Springfield (Ill.) Consol. St. Ry	7	Psr. Cl.	45	City	Semi	..
Springfield (Vt.) Elect. Ry. Co	1	Snow Plow	..	..	..	..
Springfield (Mass.) St. Ry	10	Psr. Conv.	43	City	Semi	..
	1	Express	45	..	Semi	..
Springfield (O.), Troy & Piqua Ry	1	Express	51	Int.	Semi	..
	1	Exp. Trail	45	Int.	Semi	..
Stark Elec. R. R	2	Psr. Cl.	55	Int.	All	..
	3	Psr. Cl.	43	City	All	..
Steubenville & East L'p'l Ry	5	Psr. Trail	47	City	All	..
Steubenville Ry	3	Psr. Cl.	44	Int.	All	..
Stroudsburg P's'g'r Ry	1	Psr. Conv.	31	City	Wood	Two
Tazewell St. Ry	1	Psr. Cl.	31	City	Semi	Two
Third Avenue Ry	1	Dump	..	..	..	..
Tidewater Pr. Co	2	Psr. Cl.	31	City	Semi	One
Tiffin, Fostoria & East'n Ry	1	Psr. Cl.	55	Int.	All	..
Toledo, Bowl'g Green & S'n Tr. Co	1	Psr. Cl.	45	Int.	All	..
	2	Express	55	..	All	..
Toledo, Fostoria & F'dl'y Ry	1	Psr. Cl.	..	City	All	..
Toledo Rys. & Lt. Co	60	Psr. Cl.	50	City	All	..
Toronto Civic Ry	13	Psr. Cl.	47	City	Semi	..
Toronto Ry. Co	25	Psr. Conv.	..	City	..	..
Toronto Suburban St. Ry	2	Psr. Cl.	50	City	Wood	..
Towson & Cockeysville El. Ry	1	St. Batt.	26	City	Wood	One
Tri-City Rg of Illinois	3	Psr. Cl.	42	City	Semi	..
Tri-City Ry. of Iowa	10	Psr. Cl.	37	City	All	..
	1	Dump	..	..	..	..
Twin City Rapid Tr. Co	63	Psr. Cl.	47	City	Semi	..
Union Depot Bridge & Term. Co.	5	Psr. Cl.	30	City	All	One
Union St. Ry., New Bedford, Mass	12	Psr. Cl.	44	City	All	..
Union Tr. Co. of Coffeyville, Kan.	1	Loco.	..	..	..	..
Union Tr. Co. of Indiana	1	Sweeper	..	..	..	..
United Rys. & Elect. Co	100	Psr. Cl.	44	City	Wood	..
United Rys. of St. Louis	4	Sweeper	40	..	..	..
United Traction Co	10	Psr. Cl.	33	City	Semi	..
Valley Railways	4	Psr. Cl.	40	City	Semi	..
Vicksburg Lt. & Tr. Co	1	Psr. Cl.	33	City	All	Both
Virginia Ry. & Pr. Co	1	Psr. Cl.	45	Int.	All	..
	3	Psr. Trail	45	Int.	All	..
Visalia Electric Co	1	Psr. Cl.	72	Int.	Semi	..
Warren St. Ry	1	Psr. Cl.	47	City	Semi	..
Washington & Maryland Ry	1	Psr. Cl.	25	City	Semi	Both
Waterbury & Milldale Tr'w'y	2	Psr. Conv.	31	Int.	Semi	Two
Waverly, Sayre & Athens Tr. Co	1	Psr. Cl.	47	City	Wood	..
West Chester St. Ry. Co	2	Psr. Cl.	45	Int.	All	..
West Penn Rys	6	Psr. Cl.	58	Int.	Semi	..
	1	Express	45	..	Wood	..
	1	Sweeper	..	..	..	..
West Virginia Tr. Co	1	Express	..	..	Wood	..
Western Lt. & Pr. Co	3	Psr. Cl.	28	City	All	Both
Wheeling Tr. Co	8	Psr. Cl.	45	City	All	..
Wichita Falls Tr. Co	5	Psr. Cl.	2	City	Semi	One
Wichita R. R. & Lt. Co	15	Psr. Cl.	30	City	All	One
Wisconsin Ry., Lt. & Pr. Co	4	Psr. Cl.	31	City	Semi	One
	7	Psr. Cl.	43	City	Semi	..
Worcester Consol. St. Ry	11	Psr. Cl.	44	City	Semi	..
	3	Express	45	..	Semi	..
	3	Snow Plows	..	..	..	..
York Railways	6	Psr. Cl.	35	City	All	Two
	1	Dump	..	..	..	..

Electric Railway Statistics

Figures Are Given by States of the Miles of Track and Number of Cars Owned

THE accompanying table gives statistics of the miles of track and cars of the electric railway companies in the United States, made up from the August, 1916, *Electric Railway Directory* of the McGraw Publishing Company. The dates of the reports in this directory average about June, 1916, so that the table may be considered to represent the statistics of the industry at about that time.

A comparison of the totals given in this table with those in a somewhat similar table published in the issue of Jan. 22, 1916, will show for all states a total of 47,562 miles as compared with a total of 46,454 miles last year, and 100,476 cars as compared with 99,405 last year. A comparison by states, however, will show some decreases in both cars and miles of track, while in the case of other states, there are increases of considerable magnitude. This condition, to which attention was directed last year, may be accounted for, in part, by the seeming inevitable discrepancies which occur when reports are made out by different officials each year, in part to differences in the methods of classifying cars, and in part to more exact information as to the portions of interstate railways which are located in two or more states.

A few other words of explanation are necessary. The electrified mileage of steam railroads is included in all cases, but under cars only the electric locomotives and the electric motor cars on such roads are given. That is to say, in such cases, trail cars and service cars have not been included. Gasoline motor passenger cars are included in the column of motor passenger cars, but in most cases the miles of track over which the gasoline motor cars operate have been omitted from the mileage column as these tracks are used very largely for steam freight trains and it has been the intention to make the table primarily one of city and interurban passenger properties. In a few cases, where a company owns a large number of service cars compared with the number of passenger cars owned, the total number of such service cars has been intentionally omitted from the table.

TABLE SHOWING STATISTICS OF ELECTRIC RAILWAY COMPANIES IN THE UNITED STATES

	Number of Companies	Miles of Track	Motor Passenger Cars	Trail Passenger Cars	Electric Locomotives	Express Motor Cars	Freight Cars	Service and Other Cars	Cable and Horse Cars
New England States:									
Connecticut	12	1,592	2,160	44	100	....	....	67	....
Maine	16	580	589	....	3	3	56	149	6
Massachusetts	43	3,245	7,922	236	3	23	37	1,144	....
New Hampshire	13	210	266	....	1	....	2	29	2
Rhode Island	3	438	1,051	47	....	....	....	259	....
Vermont	10	125	142	....	....	....	3	17	..
Total	97	6,190	12,130	327	107	26	98	1,665	8
Eastern States:									
Delaware	2	153	309	....	....	....	....	80	....
District of Columbia	7	412	1,078	....	....	....	....	433	....
Maryland	11	675	2,155	....	10	....	3	218	....
New Jersey	29	1,538	2,810	2	2	13	....	53	....
New York	110	5,477	16,559	1,124	138	11	35	2,161	203
Pennsylvania	128	4,477	8,575	16	2	6	78	602	1
Virginia	17	602	921	25	....	....	....	179	....
West Virginia	25	633	641	....	12	....	3	43	....
Total	329	13,967	33,048	1,167	164	30	119	3,769	204
Central States:									
Illinois	72	3,760	5,922	697	51	....	962	627	....
Indiana	44	2,304	1,923	....	1	7	3	256	....
Iowa	27	868	965	13	19	....	....	365	....
Kentucky	9	462	992	26	....	....	21	58	....
Michigan	25	1,676	2,272	8	20	102	13	473	....
Minnesota	14	715	1,250	8	8	....	....	287	....
Missouri	22	1,113	2,514	6	....	....	....	459	....
Ohio	80	4,300	5,512	76	11	6	28	1,309	2
Wisconsin	21	768	875	142	....	....	3	60	....
Total	314	15,966	22,225	976	110	115	1,030	3,894	2
Southern States:									
Alabama	15	365	437	34	....	....	2	210	....
Arkansas	11	134	237	....	....	....	....	54	....
Florida	9	193	248	....	....	....	....	59	....
Georgia	17	485	691	5	....	....	....	88	2
Louisiana	10	328	680	....	....	....	....	140	....
Mississippi	11	123	159	2	....	....	....	27	....
North Carolina	13	289	301	....	6	....	2	217	....
South Carolina	7	113	156	6	....	....	2	19	....
Tennessee	14	461	835	....	1	....	3	147	
Total	107	2,491	3,744	47	7	....	9	961	2
Western States:									
Arizona	4	52	45	1	....	....	....	1	....
California	42	3,232	3,674	81	69	12	338	1,746	109
Colorado	13	459	414	157	....	....	....	259	2
Idaho	6	180	68	....	....	....	....	19	
Kansas	20	527	391	3	....	....	12	112	3
Montana	9	647	110	20	35	....	....	19	....
Nebraska	6	254	538	10	1	....	....	65	....
Nevada	2	10	12	....	....	....	....		....
New Mexico	2	9	11	....	....	....	....		....
North Dakota	6	38	77	....	....	....	....	14	....
Oklahoma	15	301	242	7	....	....	....	100	....
Oregon	10	733	799	47	19	3	146	548	....
South Dakota	3	26	28	2	....	....	....	5	....
Texas	40	977	1,188	78	....	14	3	186	....
Utah	5	425	275	6	....	1	2	262	....
Washington	13	1,056	1,027	24	27	819	29	110	45
Wyoming	2	22	12	7	....	....	....	3	....
Total	198	8,948	8,911	443	151	849	530	3,449	159
Total, all States	1,045	47,562	80,058	2,960	539	1,020	1,786	13,738	375

New Electric Railway Track Built in 1916

Reports Received from the Various Electric Railway Companies of the United States and Canada Show That Approximately 700 Miles of New Track Were Constructed or Electrified During the Year—A Marked Decrease from Previous Years

THE single-track mileage of new line built or electrified and placed in operation during the year 1916 by the electric railways of the United States and Canada is tabulated in the accompanying lists. The data for these records have been compiled from reports received from practically every electric railway in the United States and Canada and represent 98 per cent of the total operated mileage.

The total new mileage for the year, amounting to 744.3, is materially less than the total of any previous year for which record has been kept. This condition is shown in the following table, which contains the statistics obtained in previous years since 1907, but note should be made of the fact that by far the greater part of the decrease has been a loss in new electric railway track, since the electrified steam railroad mileage of 388 is not an exceptional decrease from the high corresponding figure of last year. Thus it becomes increasingly evident that the two classes of electric railway mileage display wholly independent tendencies and should be considered separately.

Of the 356.3 miles of new electric railway track that has been built during the past year, about two-thirds may be classed as interurban—only a slightly larger ratio than that which existed last year. A tendency toward an evenly-distributed loss in new construction appears also in the fact that although the decrease from last year on a mileage basis is practically 50 per cent, it is only 25 per cent on the basis of states represented and a loss of only 33 per cent on the basis of the number of companies appearing in the record. In other words, the average company cut down on its new construction and relatively few gave up new work altogether. The same thing is evidenced by the fact that, in only one case was there any considerable stretch of new track put down in any particular locality, the maximum mileage built in one State being 78.4 if the electrified steam road mileage of Montana is included.

The State in question is California, whose leading position in new track construction is due to considerable extension of four of the numerous interurban railways characteristic of the west coast. Illinois ranks second in the list, with approximately 33 miles of new track, of which 25 miles were constructed by the Chicago Surface Lines—the largest extension of strictly city tracks reported for the year. In this connection it may be said that Canada appears to have maintained track extensions to a rather surprising degree in view of the European war, since no less than ten electric railways are represented with 9 miles of new track exclusive of the 53-mile electrification of the Lake Erie & Northern.

This 53 miles of the Lake Erie & Northern is included in the total of 388 miles of electrified steam railroad track, but the major part of the steam railroad track equipped for electric operation is contributed by the Chicago, Milwaukee & St. Paul installation extending across the Rocky Mountains. This project includes four engine divisions, of which one was placed in service in 1915 and two during the past year. The remaining division will be completed early in 1917.

	New Electric Railway Track Built	Electrified Steam Line	Total New Electric Mileage
1907	....	....	1880.0
1908	1174.5	84.0	1258.5
1909	774.7	112.4	887.1
1910	1204.8	192.4	1397.2
1911	1105.0	86.5	1191.5
1912	869.4	80 8	950.2
1913	974.9	119.0	1093.9
1914	716.5	229.0	946.4
1915	596.0	448.2	1044.2
1916	356.3	388.0	744.3

ALABAMA

	Miles.
Mobile, Volanta & Pensacola R. R.	1.0
	1.0

CALIFORNIA

	Miles.
Fresno Interurban Ry	15.0
Oakland, Antioch & Eastern Ry	1.4
Pacific Electric Ry	16.3
San Diego Electric Ry	2.2
South San Francisco R. R. & Power Co	0.5
Tide Water Southern Ry—Modesto to Turlock	17.0
Visalia Electric R. R. Co.—Exeter to Strathmore to Lindsay 21.5 miles. Southeast to Portersville 4.5 miles	26.0
	78.4

CONNECTICUT

	Miles.
Connecticut Co.	7.3
Lordship Co., Bridgeport, Conn	0.25
	7.55

DISTRICT OF COLUMBIA

	Miles.
Capital Trac. Co.	0.1
	0.1

FLORIDA

	Miles.
St. Petersburg & Gulf Ry	1.5
	1.5

GEORGIA

	Miles.
Georgia Ry. & Power Co	4.5
	4.5

HAWAII

	Miles.
Honolulu Rapid Transit & Land Co	0.2
	0.2

ILLINOIS

	Miles.
Bloomington, Pontiac & Joliet Ry. Co	0.5
Centralia & Central City Trac. Co	0.2
Chicago Heights St. Ry	0.75
Chicago, Ottawa & Peoria	0.3
Chicago Heights St. Ry	0.7
Decatur Ry. & Light Co	0.5
Joliet & Eastern Trac. Co	0.1
Kankakee & Urbana Trac. Co.—Connects Ludlow and Paxton	5.0
Springfield Consolidated Ry. Co	0.5
Tri-City Ry. Co. of Illinois	0.4
	33.2

INDIANA

	Miles.
Chicago Lake Shore & South Bend Ry	2.3
Interstate Public Service Co	0.5
	2.8

IOWA

	Miles.
Des Moines City Ry	3.1
Fort Dodge, Des Moines & Southern R. R. Co.—Swanwood Junction to Des Moines	4.5
Fort Madison St. Ry. Co	0.3
Inter-Urban Ry. Co	2.6
Keokuk Electric Co	0.3
Tri-City Ry. Co. of Iowa	0.8
	11.6

KANSAS

	Miles.
Salina St. Ry. Co	0.1
Topeka Rys.	0.5
Hutchinson Inter-Urban Ry. Co	1.1
	1.7

KENTUCKY

	Miles.
Louisville Ry. Co	4.0
Southern Traction Co., Inc	0.25
	4.25

LOUISIANA

	Miles.
New Orleans Ry. & Lt. Co	0.9
	0.9

MARYLAND

	Miles.
United Rys. & Electric Co	5.5
	5.5

MASSACHUSETTS

	Miles.
Boston Elevated Ry. Co	4.5
Springfield St. Ry. Co	1.5
Union St. Ry. Co	0.5
	6.5

MICHIGAN

Detroit United Ry. Co	23.9
Escanaba Traction Co	0.3
Grand Rapids Ry. Co	0.5
	24.7

MINNESOTA

Duluth St. Ry. Co	5.4
Twin-City Rapid Transit Co	3.0
	8.4

MISSOURI

Kansas City Rys. Co	9.3
United Rys. of St. Louis	1.1
	10.4

MONTANA

Butte Electric Ry	2.5
Chicago, Milwaukee & St. Paul Ry.—Electrification. Between Three Forks and Harlowton 114 miles of main track; 54.5 miles of side track and yards. Between Deer Lodge and Alberton, 111 miles of main track; 53.0 miles of side track and yards	332.5
Missoula St. Ry. Co	1.5
	336.5

NEW JERSEY

Public Service Ry. Co	1.2
	1.2

NEW YORK

Brooklyn Rapid Transit Co	6.0
Buffalo & Lake Erie Trac. Co	0.9
International Ry. Co	0.5
Manhattan & Queens Trac. Corporation	2.7
New York State Rys.—Syracuse Lines	0.2
Third Ave. Ry	1.6
	11.9

NORTH CAROLINA

Goldsboro Electric Ry	1.5
Piedmont & Northern Ry	3.5
Southern Public Utilities Co	2.0
	7.0

OHIO

Cleveland Ry. Co	3.0
Mahoning & Shenango Ry. & Light Co	3.0
Portsmouth St. R. R. & Light Co.—Between Wheelersburg and Hanging Rock	21.0
Toledo Rys. & Light Co	0.6
	27.6

OKLAHOMA

Ardmore Ry. Co	1.25
Oklahoma Ry. Co.—Edmond to Guthrie	16.0
Tulsa St. Ry. Co	1.0
	18.25

PENNSYLVANIA

Allen St. Ry. Co	0.3
Chester & Eddystone St. Ry. Co	1.9
Eastern Pennsylvania Rys. Co.—Pottsville to St. Clair	2.0
Lehigh Trac. Co	0.3
Northwestern Pennsylvania Ry. Co—Venango to Cambridge Springs	3.6
Philadelphia Rapid Transit Co	0.9
Philadelphia & West Chester Trac. Co	1.0
Pottstown & Phoenixville Ry. Co	4.0
Reading Transit & Light Co	1.0
Scranton & Binghamton R. R. Co.—Brooklyn to Montrose	10.0
	25.0

RHODE ISLAND

Rhode Island Co	0.6
	0.6

SOUTH DAKOTA

Sioux Falls Trac. System	0.5
	0.5

TENNESSEE

Chattanooga Trac. Co.—Valley Junction to Red Bank, 5 miles, and C. & D. Junction to C. N. O. & H. Ry., 5 miles	10.0
Jackson Ry. & Light Co	3.0
	13.0

TEXAS

Beaumont Trac. Co	0.7
	0.7

WASHINGTON

Lewiston-Clarkston Transit Co	2.0
Walla Walla Valley Ry. Co	0.25
	2.25

WEST VIRGINIA

Appalachian Power Co	1.7
Charleston Interurban R. R. Co.—Marmet to Cabin Creek Junction	6.5
Norfolk & Western Ry. Co. (Elec. Div.).—Electrification of branch line to Pocahontas, Va.	2.5
Princeton Power Co.—Interurban through New Hope and Billie	12.0
	22.7

WISCONSIN

	Miles.
Chicago, Harvard & Geneva Lake Ry	0.6
Madison Rys. Co	1.0
	1.6

WYOMING

Cheyenne Electric Ry. Co	0.25
	0.25

CANADA

Calgary Municipal Ry	3.5
Lake Erie & Northern Ry.—Electrification from Galt to Paris, Brantford, Waterford, Simcoe and Port Dover	53.0
London St. Ry. Co	0.8
Montreal & Southern Counties Ry.—Abbotsford to City of Granby	8.5
Port Arthur Civic Ry. Co	1.1
Quebec Ry., Light & Power Co	0.5
Reginia Municipal Ry	1.4
Sandwich, Windsor & Amherstburg Ry	0.8
Sarnia St. Ry. Co	0.5
Toronto Civic Railway	1.2
Toronto Ry. Co	0.75
	72.05

AMERICAN ASSOCIATION NEWS

Boston Meeting Program

Supplementing the statement made in the issue for Dec. 16, the following brings the information regarding the mid-year meeting program up to date:

a. General business.
b. Report of committee on social relations:
   1. Minimum wage,
   2. Old-age pensions,
   3. Employees' thrift.
c. Prepared discussion by E. E. Rice.
d. Paper on "Wage Arbitration and Contracts," by Bentley Warren, Boston, Mass.
e. Paper on "Salesmanship in the Electric Railway Business," by Robert Frothingham, New York City.

Power Distribution

The Engineering Association committee on power distribution met in Chicago, Ill., on Jan. 3, 4 and 5. The committee devoted its combined efforts to revision of the specifications for line construction and line materials. As this issue of the paper goes to press a telegram announces that Friday evening was to be spent by the committee in an inspection of one of the automatic substations of the Elgin & Belvidere Electric Railway as guests of E. S. Gillette, electrical engineer Aurora, Elgin & Chicago Railroad.

The Chicago meeting was attended by the following committee members: C. L. Cadle, Rochester, N. Y., chairman; R. H. Rice, Chicago, Ill.; E. J. Blair, Chicago, Ill.; C. R. Harte, New Haven, Conn.; E. S. Gillette, Aurora, Ill.; C. E. Fritts, Kansas City, Mo.; J. H. Libbey, Boston, Mass., and A. Schlessinger, Indianapolis, Ind. C. C. Beck, commercial engineer Ohio Brass Company, was also present by invitation, for the purpose of representing the line material section of the Associated Manufacturers of Electrical Supplies.

Training of Transportation Employees

The Transportation & Traffic Association committee on the above subject met in Chicago, Ill., on Jan. 3 and 4 and finished the task of co-ordinating the work of previous committees. In attendance were G. T. Seely, Chicago, chairman; H. B. Flower, Baltimore, Md.; C. W. Kellogg, Keokuk, Iowa; J. E. Gibson, Kansas City, Mo., and W. A. Carson, Evansville, Ind.

H. J. Kenfield has been appointed chairman of the transportation sub-committee in charge of the Illinois-Wisconsin district.

Receiverships and Foreclosure Sales

Mileage Placed in Receivers' Hands During 1916 Was Next to Smallest in Last Eight Years —Mortality Rate Through Foreclosure About the Average

THE record of electric railway receiverships for 1916 is considerably better than that for many of the years preceding. In fact, the number of companies, or fourteen, whose finances in 1916 became involved to the point of receivership, was the smallest in the last eight years with the exception of eleven in 1910 and ten in 1914, while the mileage concerned was in the low group and the least with the exception of that in 1913. The showing made in 1916 was especially in contrast to that in 1915, the fourteen railways involved in the last year having a mileage of 351.06 and a capitalization of $24,988,800, as compared to a mileage of 1152.10 and a capitalization of $79,670,425 for the twenty-seven lines in 1915. The receiverships for the last eight years compare as follows:

	Number of Companies	Miles of Track	Outstanding Stock	Outstanding Funded Debt
1909	22	558.00	$29,962,200	$22,325.000
1910	11	696.61	12,629.400	75.490,735
1911	19	518.90	29.533,450	38,973,293
1912	26	373.58	20,410,700	11,133,800
1913	18	342,84	31,006,900	47,272.200
1914	10	362.39	35.562,550	19,050.460
1915	27	1152.10	40,298.050	39,372,375
1916	14	351.06	14,264,600	10,724,200

The accompanying table gives the details of electric railway receiverships in the last calendar year. An attempt was made at all times to take the figures from the most up-to-date and most authoritative sources, and to sift out the correct data in many cases where there were a surprising number of conflicting statements in the financial manuals, particularly with reference to the smaller companies. These, it will be noted, constituted the majority of the railways placed in receivership, only three having more than 50 miles of track.

Most of the receiverships were evidently caused by accumulated financial burdens due to rising costs, operation in poor territory or inherent weakness of organization, but in a few cases there were special reasons. For example, the chief cause of the financial troubles of the Monmouth County Electric Company was the competition of jitneys. A receiver was appointed for the Cincinnati, Dayton & Toledo Traction Company to take the place of a bondholders' protective committee in collecting the rentals of its property from the lessee, the Ohio Electric Railway, which desired a second modification of the lease on account of losses thereunder.

The number of electric railways sold at foreclosure in 1916 was nineteen, the same as in the preceding year. Although the mileage was greater, owing to the resale of the Chicago & Milwaukee Electric Railroad property after the cancelled sale of 1912, the general record was not far from the average for the last eight years. The following table shows the complete comparative figures for this period:

	Number of Companies	Miles of Track	Outstanding Stock	Outstanding Funded Debt
1909	21	488.00	$22,265.700	$21.174,000
1910	22	724.36	19,106.613	26,374.065
1911	25	660.72	91,354,800	115,092.750
1912	18	267.18	14,197.300	10,685.250
1913	17	302.28	15,243,700	19.094,500
1914	11	181.26	26.239,700	44.094.241
1915	19	308.31	30,508,817	16,759,997
1916	19	431.35	13,655.400	22,542.300

The detailed foreclosure sales are published in the accompanying table. As in preceding years, some electric railways for which receivers had been appointed or against which foreclosure suits had been brought were able to effect reorganization without public sale or have the case dismissed by the court. All the various forms of reorganization, readjustment and change in ownership without formal foreclosure sale were omitted in compiling the table. In passing, however, it might well be noted that the 1915 receivership of the Des Moines City Railway was dissolved without sale after the settlement of the franchise question, and the 1915 receiver of the Kansas City, Clay County & St. Joseph Railway, appointed to protect a judgment for $1,500,000 to the Interstate Railway for the taking of right-of-way on which it held options, was removed in 1916 after the perfection of a satisfactory bond pending final decision on the appeal of the damage case.

In the majority of cases the foreclosure sales in 1916 were the last step prior to the beginning of business through a reorganized company or an entirely new one. For some lines, however, such sales meant a complete cessation of operation and dismantlement. The Mount Vernon Railway, the Lima & Honeoye Light & Railroad Company, the Mountain Railway and half of the Lake Erie, Bowling Green & Napoleon Railway suffered such a fate, and according to reports the Lancaster & Southern Street Railway was destined also to be junked.

ELECTRIC RAILWAY RECEIVERSHIPS IN 1916

	Mileage	Outstanding Stock	Outstanding Funded Debt
Algiers Railway & Lighting Company	6.00	$430,000	$35,000
Boise Railroad, Ltd	8.00	510,400	389.000
Bristol Traction Company	15.30	143,800	192,500
Cape May, Delaware Bay & Sewell's Point Railroad	20.00	150,000	150,000
Cincinnati, Dayton & Toledo Traction Company	83.90	2,250,000	5,000,000
City Railway, Mt. Vernon, Ill	3.25	40,000	......
Gary, Hobart & Eastern Traction Company	9.00	125,000	125.000
Lancaster & Southern Street Railway	7.35	100,000	109,000
Lancaster & York Furnace Street Railway	12.50	170,400	150.000
Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company	56.00	8,331,000	1,000.000
Monmouth County Electric Company	17.71	325.000	500,000
Nashville-Gallatin Interurban Railway	27.05	750,000	600.000
Southwestern Traction Company	15.00	189.000	130.000
Winona Interurban Railway	70.00	750,000	2,343,700
Totals	351.06	$14,264,600	$10,724,200

ELECTRIC RAILWAY FORECLOSURE SALES IN 1916

	Mileage	Outstanding Stock	Outstanding Funded Debt
Ardmore Electric Railway	4.70	$200,000*	......
Chicago & Milwaukee Electric Railroad	160.00	5,000,000	$16.225.000
Choctow Railway & Lighting Company	23.26	2,000,000	1,144,000
Lake Erie, Bowling Green & Napoleon Railway	24.50	678,400	428.500
Lancaster & Southern Street Railway	7.35	100,000	109.000
Lancaster & York Furnace Street Railway	12.50	170,400	150.000
Lima & Honeoye Light & Railroad Company	4.60	5,000	......
Lykens & Williams Valley Street Railway	10.10	188,500	175,800
Mountain Railway	2.00	2,400	......
Monmouth County Electric Company	17.71	325,000	500.000
Mount Vernon Railway	9.00	10.000	40.000
Norton & Taunton Street Railway	21.20	297,000	296,000
Sapulpa & Interurban Railway	12.00	80,500	......
Seattle, Renton & Southern Railway	25.00	1,250,000	825,000
Southeastern Ohio Railway, Light & Power Company	16.34	600.000	600,000
Southern Iowa Railway & Light Company	10.00	120,000	340,000
Syracuse & South Bay Electric Railroad	26.56	1.000,000	561,000
Syracuse, Watertown & St. Lawrence River Railroad	6.35	40.000	200.000
Youngstown & Southern Railway	38.18	1,588.200	948 000
Totals	431.35	$13.655,400	$22,542.300

*Authorized amount; outstanding amount not ascertainable.

Short and Up-to-Date Articles on

EQUIPMENT AND ITS MAINTENANCE

Combination Snowplow for City and Interurban Lines of Spokane—Hardwood Key Blocks for Track and Pavement Work in New York—Reinstallation of Old Soldered Bonds by Sacramento Company—Economical Work by Pneumatic Tampers of Pittsburgh Railways—Mirror for Protecting Track Crossing in San Antonio, Etc.

(Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.)

A Combination Snowplow for City and Interurban Use

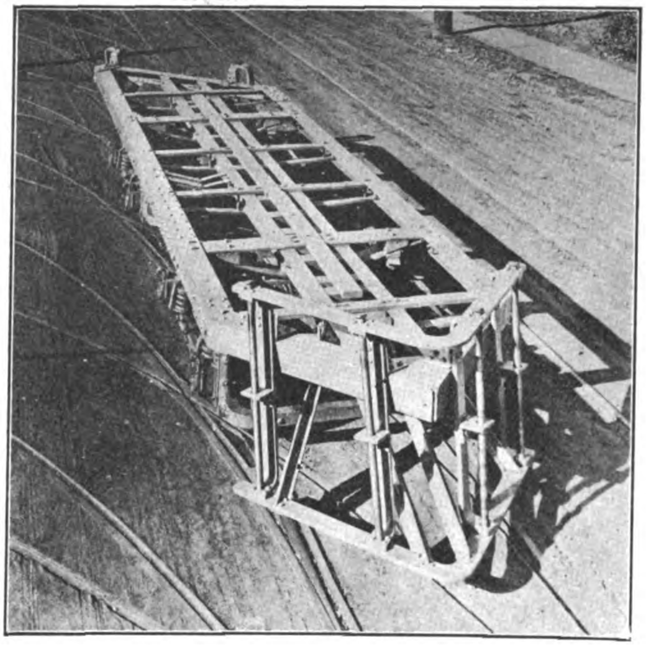
Washington Water Power Company Has Built a Plow Which Is Suitable for City and Interurban Snow Fighting

BY R. A. WILLSON
General Superintendent Washington Water Power Company, Spokane, Wash.

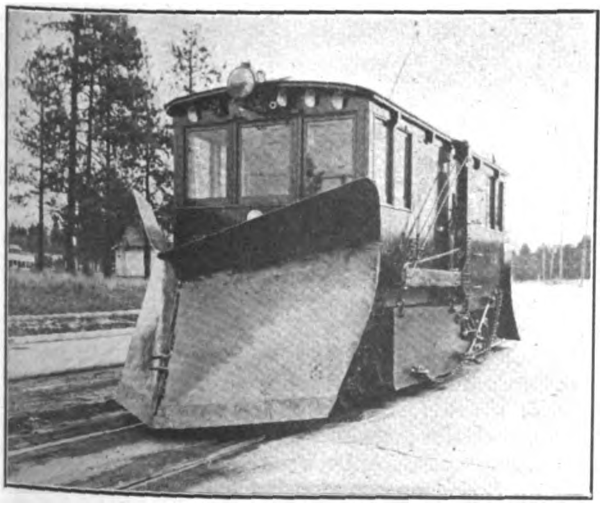
A snowplow to be used on the city and interurban lines of Spokane, Wash., has recently been built by the Washington Water Power Company. Inside a city, in clearing double tracks of snow it is desirable to use a shear plow which throws the snow to only one side of the car. On interurban lines, however, the snow often forms heavy drifts which the shear plow cannot clear off, and it is necessary to use a plow with a sharp nose which cuts through the snow and throws it to both sides. The plow described below combines both kinds of blade mounted on the same frame.

This frame is built of heavy structural steel, as may be seen from the illustration, the side sills, for example, being 8 in. x 8 in. channel bars. The width of the frame as shown is 7 ft. 10 in. and the length is 36 ft., and with the plows in position the total length is 43 ft. 3 in. The weight of the whole car and its equipment is 35 tons. Brill 27-F trucks having a 6-ft. wheelbase set with a distance of 15 ft. between centers are used, and mounted on these trucks are four 60-hp. General Electric motors which drive through gears having a ratio of 15 to 71.

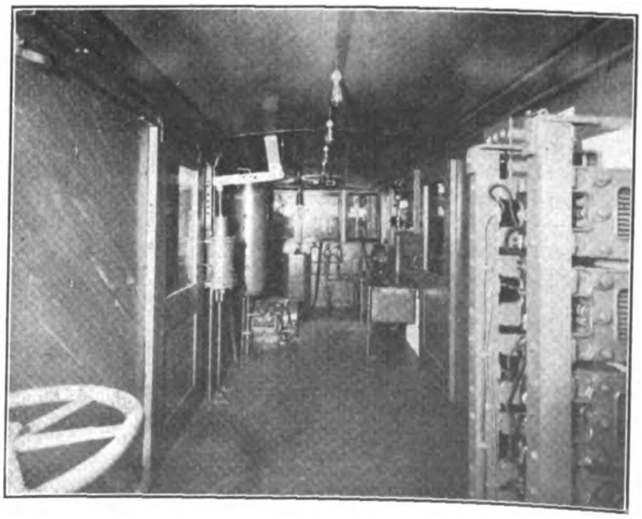
The plows are of steel boiler plate mounted on heavy frames. The shear plow, as shown in the illustration, may be used in connection with the auxiliary wing which is shown swung in position at the center of the car. The shear is 12 ft. x 6 ft. and the wing is 10 ft. x 3 ft., the maximum sweep of both shear and wing being 15 ft. Another illustration shows the sharp-nosed or wedge plow which is 9 ft. 9 in. across and 7 ft. high. It splits the heavy drifts and throws the snow to both sides. Both types of plow overhang the track 20 in. on each side. Their bottom or cutting edges are riveted to the main plow face and may be replaced if injured by striking an immovable object. By means of compressed-air cylinders, the plows are raised on slid-



HEAVY STEEL FRAME OF COMBINATION SNOWPLOW



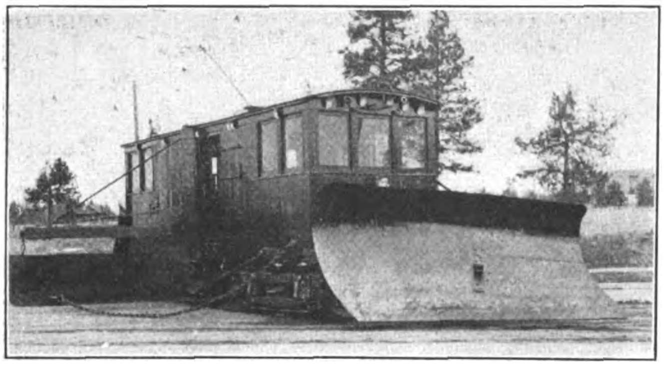
VIEW OF NOSE PLOW USED FOR CLEARING HEAVY DRIFTS FROM THE TRACK



INTERIOR OF CAR, SHOWING COMPRESSOR, RESERVOIRS, OPERATING CYLINDER FOR SIDE WING, ETC.

ing rods to a maximum height of 10 in. above the rail. In addition to the plows, the car is equipped with spring steel track scrapers. These are held against the track under pressure, which may be made as high as 70 lb. for each scraper, but when they come in contact with an immovable object they spring over it without being damaged.

The car body is built of wood reinforced with steel and it has sixteen windows of 3/8-in. plate glass set in heavy frames. A tool box is built on the outside of the car for carrying picks, snow shovels and other tools. The car is equipped with a General Electric magnetite headlight which can be moved from one end to the other, and stationary Golden Glow headlights on each end. There is also a row of incandescent lamps circling the car underneath the eaves for general illumination of the surroundings.



VIEW OF SHEAR PLOW AS USED WITH SIDE WING

As far as possible all of the operating mechanism is placed inside the car to avoid slush and snow. A view of the car's interior given here shows (on the left-hand side of the car) the air compressor, the large reservoirs and the cylinder for operating the side wing.

The convenience and comfort of the men running the car was carefully looked after. To this end the switches which control the different apparatus were plainly marked, and a radiator for warming the entire car and a small heater for cooking coffee, as well as comfortable chairs and a table, were provided. These luxuries serve to add some pleasure to what is usually a disagreeable task.

Soldered Bonds Reinstalled at Low Cost

Old Bonds Removed from Web of Rail and Soldered to the Rail Head

BY W. H. EVANS
Electrical Engineer Northern Electric Railway, Sacramento, Cal.

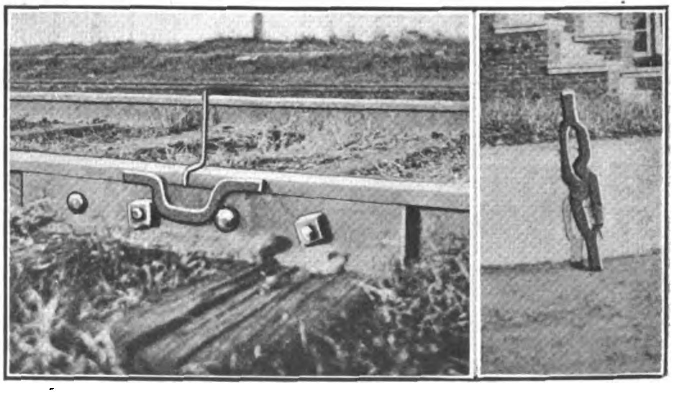
The experience of the Puget Sound Traction, Light & Power Company with soldered rail bonds, as outlined in the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 28, 1916, page 938, is of interest to those companies which still use soldered bonds, and our own experience along these lines may prove of further interest, particularly as a large number of roads have had unprofitable experiences with the soldered type of bond.

The Northern Electric Railway has some 150 miles of track, mostly on private right-of-way, of 60-lb. A. S. C. E. T-rail section on which the bonding originally consisted of two 10-in., 200,000-circ. mil. ribbon type soldered bonds soldered to the web of the rail under the angle bars at each joint. Owing to the very restricted clearance under this joint the bonds soon became pinched and either failed by coming loose at one or both terminals or the ribbons broke at the center of the bonds. The cost of this type of bond installed was 55 cents each. The bond itself cost 27.5 cents, the other material such as solder, gasoline, etc., nine cents, and the labor, 18.5 cents. The average life of this bond was probably not in excess of six years, and a large number failed in less time.

It became imperative to rebond the line and after a consideration of various type of bonds, it was decided to install the same bond, but in a different manner. The choice was in a way influenced by the fact that we had on hand a large number of bonds of this type, and that financial considerations forbade any large outlay for new bonds.

The 10-in. bonds were placed in a frame and by means of a bulldozer were made to assume a U-shape with the ends turned out parallel to the top of the rail giving us a bond for application on the outside head of the rail. This newly-formed bond was then soldered to the head of the rail by a method which, I believe, was first developed on the Northwestern Pacific Railroad at Sausalito, Cal., and has been used by it for a number of years on soldered bonds with wonderful success.

This method as applied to our bonds consists in the formation of a substantial layer of solder between the bond terminal and the head of the rail in the following manner. The rail was first ground clean and bright, using a carborundum wheel electrically operated from the third-rail supply. Then some five or six small cuts were made vertically in the rail with hammer and chisel, the rail was then heated and tinned thoroughly, after which the bond, held in a pair of tongs, was placed against the rail and so inclined that the lower edge of the terminal touched the rail while the upper edge was about a quarter inch from the rail. Solder and heat were then applied by means of a gasoline bonding torch, care being taken not to get the rail too hot. The solder instead of running freely was puddled into the wedge-shaped space between the bond terminal and the rail. In other words, an effort was made to obtain a sort of wiped joint between the rail and the bond terminal, and while the solder was in this semi-plastic condition the terminal was pressed toward the rail leaving, however, about 1/8 in. between the terminal and the rail at the top. The bond was held in position by the tongs a very short time after removing the torch, no water being used to cool the joint; the other terminal was then applied in a similar manner.



VIEWS SHOWING NEW METHOD OF SOLDERING BONDS TO HEAD OF RAIL AND AN OLD BOND REMOVED FROM WEB OF RAIL

This process tends to cause an even distribution of solder over the faces of the bond and the rail and leaves a cushion of solder between the two. The success of this method depends upon not getting a temperature so high as to cause the solder to run too freely, as if it flows too freely it acts like drops of water on a piece of glass, gathering in spots to cover some areas of contact and leaving others with no solder. The latter in time oxidize and reduce the contact area of the terminal and also its holding power.

The concealed joints are tested by means of a Roller-Smith bond tester with a snap switch on the test handle of the test bar wired in series with auxiliary contacts at the ends of the test bar, and a small portable box of six dry cells so that the tester can use either the power current or the current from the battery. Unless traffic is very frequent we find that the auxiliary source of current is necessary if any number of joints are to be tested in an efficient manner.

In doing the rebonding it has been found profitable to open up all joints which test over 10 ft. of rail. About 50 per cent of the bonds thus reclaimed are in such shape that they can be used over again on the head of the rail and the remaining 50 per cent are so torn that they are scrapped, their value as scrap more than compensating for the cost of opening up the joints.

While the new method of bonding consists of but one bond per joint whereas there were two originally, a completely single bonded line is obtained with no expenditure for new bonds since, as noted above, about half of the bonds removed are in suitable condition to be reinstalled. At the present price of copper this means a large saving, and at the same time we have obtained a bond which promises a life at least equal to the former type, and one much more easily maintained when it does fail.

About 30,000 soldered bonds of this type have been installed, the costs of which are shown below:

Material per Bond—	Unit	Amount	Unit Cost Cents	Total Cost Cents
200,000-circ. mil bond		1.0	27.5	27.50
Gasoline	gal.	0.04	11.0	0.44
Solder	lb.	0.13	19.5	2.53
Soldering salts	cans	0.0035	180.0	0.63
Carborundum wheels	each	0.001	202.0	0.20
				31.30
Store-expense, 4 per cent				1.25
				32.55

Labor per Bond—	Cents
Testing	0.89
Supervision	0.50
Soldermen	4.09
Torchmen	3.72
Grinding	1.87
Miscellaneous	0.93
	12.00
Use of tools, 2 per cent	0.24
Total Labor	12.24
Total Material	32.55
	44.79

The rates of pay per day for this work were: foreman $3.50, soldermen $2.75, torchmen $2.50, grinders $2.50, all men working a nine-hour day. The gang usually consisted of a foreman, four soldermen, four torchmen and two grinders, with an extra man at $2.50 for part of the time to aid in painting the bonds after installation. The foreman tested all joints as well as running his gang. The men lived in an outfit car which was spotted on adjacent spurs and moved along the line as the work progressed.

It was found that the bonding men could do much better work if the connection between the tank and burner was made with about 30 in. of rubber hose instead of the iron pipe usually used. The heavy gasoline tank can then be placed on the ground at a convenient position, and the burner applied in the position most suitable for directing the flame on the rail and bond. Some experimenting has been done with the oxy-acetylene process in connection with these bonds, but the shape of the head of the bond terminal has so far prevented us from getting a good job with this process.

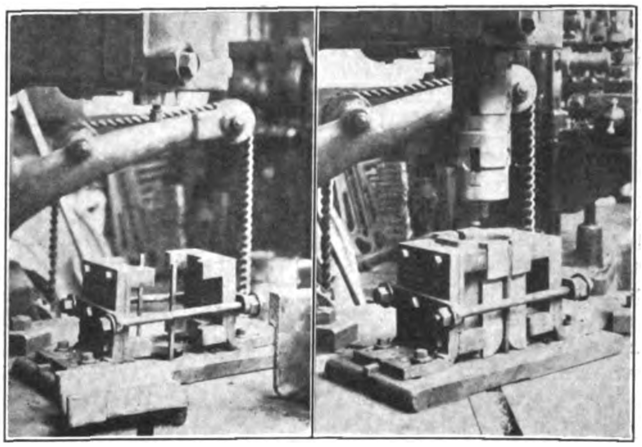
On the tracks in city streets we have been using for several years a flexible jumper bond, installed around the joint plates and soldered to the flange of the rail, in a manner similar to that used by the Puget Sound Traction, Light & Power Company. A large number of these came from old scrap third rail jumper cables which would have been sold for scrap but by this method are used for city bonding work, thus eliminating the necessity of purchasing new material.

Home-Made Jig for Boring Brasses

BY L. J. GOUTHRO

Foreman of Machine Shop Boston & Worcester Street Railway

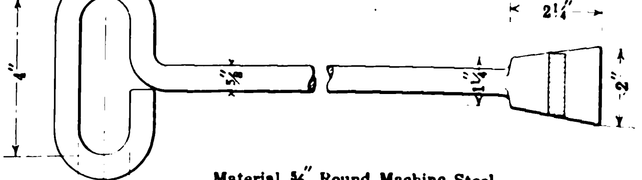
At the Framingham (Mass.) shops of the Boston & Worcester Street Railway the jig shown in the accompanying illustrations is used to expedite the boring of brasses. Fig. 1 shows the jig open, ready to receive the brasses, these being bored in pairs when set up as shown in Fig. 2. The jig consists essentially of a pair of clamps mounted on an adjustable base which is attached to the bedplate of the boring machine. These clamps are brought up against the work by two ⅝-in. bolts, and the brasses are centered by two ¼-in. x ⅜-in. vertical rods, which, when turned, give an adjustment of 1/16 in. in diameter at the brass. About 3 in. of horizontal adjustment can be had at the clamps. Two brasses of any size that the road uses can be bored out in ten minutes, whereas such an operation on a single brass would easily take twice as long on a lathe or milling machine.



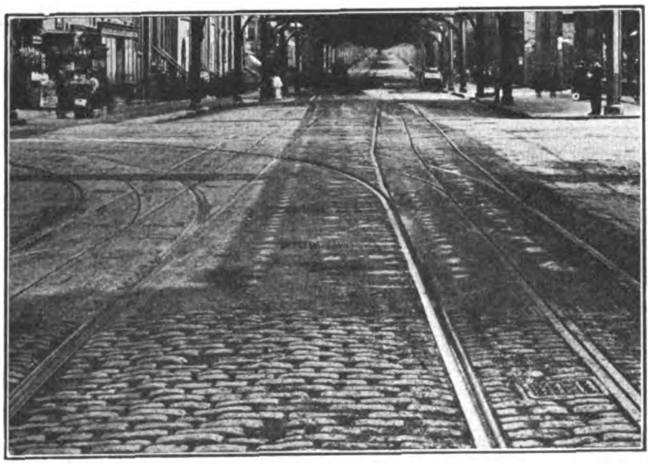
JIG FOR BORING BRASSES—FIG. 1—JIG OPEN; FIG. 2—JIG WITH BRASSES IN PLACE

Switch Iron

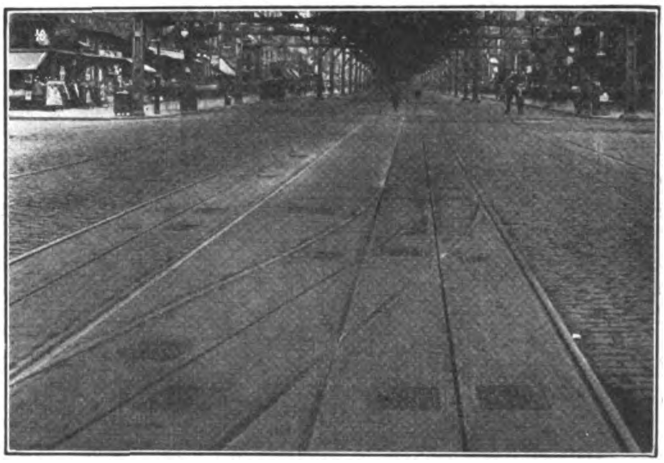
The New York State Railways, Rochester Lines, is now making switch irons according to the accompanying drawing. The print from which the cut was made was furnished by G. M. Cameron, master mechanic, and is dated Dec. 27, 1916.



DETAILS OF NEW YORK STATE RAILWAYS SWITCH IRON



WEST BROADWAY AND CANAL STREET—CONTRAST FILLER AND KEY BLOCK CONSTRUCTION WITH GRANITE IN FOREGROUND



BOWERY AND WILLIAMSBURGH BRIDGE—ONE OF NEW YORK'S HEAVIEST TRUCKING CENTERS—NOTE ORDINARY GRANITE ALONGSIDE

Rail Fillers and Key Blocks Prolong Special Work Life in New York City

Special Paving Used by the New York Railways at Street Crossings Subject to Heavy Traffic

About three years ago the New York Railways tried the experiment of lengthening the life of granite block paving and special work at Twenty-third Street and Fourth Avenue and Twenty-third Street and Sixth Avenue by installing hardwood key blocks between the granite and rail fillers along the rails. The blocks and fillers were supplied by Edward Alcott, Manassas, Va., who recommended that the key blocks be driven to such a depth that they would project, say, ¼ in. above the granite blocks on each side.

The initial jobs proved so satisfactory that the New York Railways decided to adopt this construction for practically every piece of special work on its system. At this writing more than sixty intersections have been so paved, and at some locations the plan has also been applied to the straight runs.

The actual results obtained with this method of prolonging rail life were noted in a recent inspection trip which covered some of the heaviest car and trucking streets in the world. In every instance the Alcott paving and the special work paved therewith were found to be in decidedly better condition than adjacent construction.

The inspection was made during and after a heavy rainstorm, thereby making apparent the non-slip advantages of the key block paving. As previously stated, the key blocks, as installed, project ¼ in. above the granite. The tendency of traffic is to drive these blocks down, thereby keeping the paving wedged tight, but still leaving it rough enough to give an excellent footing for horses and a better grip for automobile tires. Naturally, this construction is also watertight and therefore is not damaged either by rain or flushing by the street cleaning department.

As the key blocks assure a tight paving structure, movement of the special work is materially reduced at a great gain in the direction of noiselessness and in the reduction of track maintenance cost. To use one track foreman's expression, "They never loosen like granite does." Another consequence of this, noted after the storm in question, was the absence of water pockets and puddles. The latter condition elicited praise from the traffic policemen who are stationed at intersections.

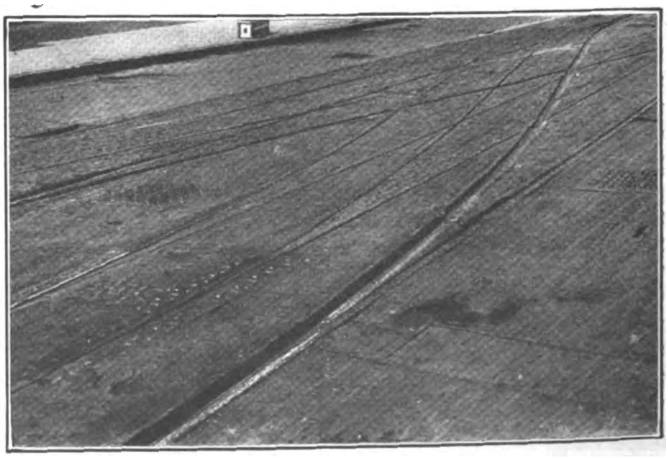
As the New York Railways installations are so numerous, it will serve to mention the following few typical cases:

Thirty-fourth Street and Eleventh Avenue. At this point the Thirty-fourth Street cars cross the New York Central freight tracks on Eleventh Avenue. On this avenue there is also extremely heavy trucking from the warehouses and river terminals. The paving has been in service one and one-half years. Other installations along Thirty-fourth Street are at Tenth, Ninth and Eighth Avenues and Cortlandt and West Streets, the last-named having been in use more than two years and nine months.

Forty-second Street, the most important crosstown thoroughfare for car and automobile travel. Alcott paving is found at Lexington, Sixth and Ninth Avenues.

POWELL CHOCOLATE WORKS
PEOPLES BANK
D. ARNOULD CONFECTIONER

WEST BROADWAY AND CANAL STREET—GENERAL VIEW OF INTERSECTION SHOWN IN DETAIL ABOVE, INDICATING CHARACTER OF TRAFFIC



CORTLANDT AND WEST STREETS—COMBINATION OF KEY BLOCKS AND RECLAIMED GRANITE—NO UPKEEP COST IN TWO YEARS AND NINE MONTHS

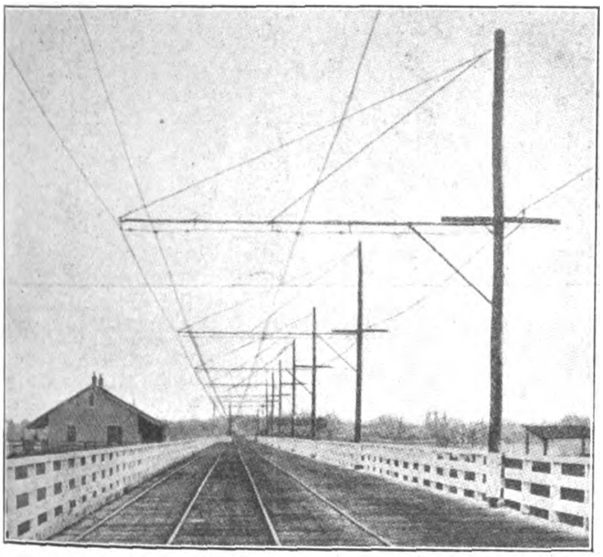
The intersection at Sixth Avenue is within two blocks of the New York Hippodrome.

West Broadway from Bleecker to Broome Streets. In this installation the blocks are used from rail to rail without any pinching of the conduit slot, showing that there is no swelling of these blocks.

Other important installations are at Twenty-third Street and Fourth Avenue, now in service three years; Canal Street and Broadway, Cortlandt and West Streets, Delancey Street approach to the East River Bridge, etc.

Long Bracket Arms for Narrow Roadway

In the issue of the ELECTRIC RAILWAY JOURNAL for Sept. 30, 1916, page 684, there appeared an account of an installation of unusually long bracket arms on the Brooklyn Rapid Transit System. In this case the purpose was to avoid interference between a cableway constructed by a contractor for digging a sewer in an important street and the span construction in use for supporting the trolley wire.



LONG BRACKET ARMS INSTALLED BY VIRGINIA RAILWAY & POWER COMPANY AT NORFOLK, VA.

The Virginia Railway & Power Company has made use of a similar scheme at one location on its right-of-way where it is so narrow that it is impracticable to set poles on both sides. A wagon road runs along one side of the tracks and the brackets span this road and the two car tracks.

The pole bracket arms, which were furnished by the Ohio Brass Company, are 23 ft. long and are made of 2-in. C-tubing. They are braced by 1½-in. C-tubing braces and in addition are supported by two rods attached to each arm. In order to protect the wooden poles from damage by wagon hubs, renewable V-shaped guards are placed at the bottom of each pole.

Pneumatic Tampers Cut Labor Cost in Half in Pittsburgh

The Tamping Outfits Also Reduce the First Cost of Welding Equipment

The Pittsburgh Railways was one of the first to use pneumatic tampers. The present equipment consists of two compressors, each of which furnishes power for a battery of six tampers. These machines have three lines, respectively 50 ft., 100 ft. and 150 ft. long and each line takes care of two tampers.

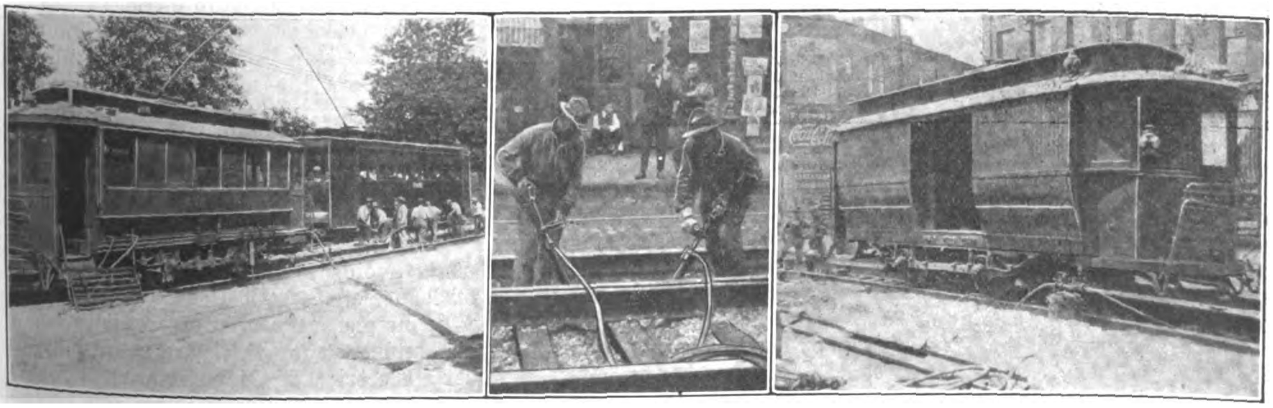
The company is also planning to purchase five portable sets, made to handle four tampers each, in order to secure the convenience of working with compressor equipment that can be kept off the tracks where traffic is being maintained upon the tracks undergoing repairs.

As in other installations, the pneumatic tampers show a decided saving in cost, the saving per foot of track being about 15 cents or one-half of the former cost. The proportionate saving in men, however, is greater, and this is an advantage, particularly as the much smaller force that is required is of a higher grade. There is only 30 per cent of the force used that would be required for hand tamping.

The ballast used in Pittsburgh is classified as "coarse," in which sizes up to 2½ in. are used, and as fine, in which 1 in. is the largest size. The machines tamp both classes of ballast much better than was customary with hand labor. Though the tamping is done as a rule with the 1-in. ballast, the rough ballast is spread, compacted and rolled to a depth of about 6 in. before the track is laid.

The company has also taken advantage of the Ingersoll-Rand tamping equipment to reduce the first cost of Thermit welding outfits. The ordinary preheater used in connection with Thermit joints includes a blower outfit which costs about $600. The Pittsburgh Railways only find it necessary to use of this outfit the tanks and burners costing about $35 to do the preheating in connection with reduced air pressure supplied from the compressor outfits.

A second by-product of the tamping equipment is the forthcoming use of small air drills, which are lighter than electric drills, in making joints immediately following the tamping. Also having compressed air on the job, it may be found to be useful to run air drills to break up and remove concrete.



PNEUMATIC TAMPERS AT WORK IN PITTSBURGH—SERVICE CAR WITH TAMPING OUTFIT, AND TAMPING GANG; PAIR OF TAMPERS IN ACTION; MIXER TANK AND BUNSEN BURNER REPLACING WELDING PREHEATER

Mirror Used in Safeguarding Crossing

The accompanying illustration shows how W. W. Holden, superintendent of transportation San Antonio (Tex.) Traction Company has used a mirror to do the work of a signal in protecting a crossing on his road. The route of car A is straight head while car B takes the route indicated by the dash line and arrow points. The track layout is such that before the mirror was used the motormen on the two cars could not see each other. The placing of a mirror at the point shown in the diagram brings the two cars within view of each other before they reach the crossing, and thus the danger of a collision is greatly reduced.

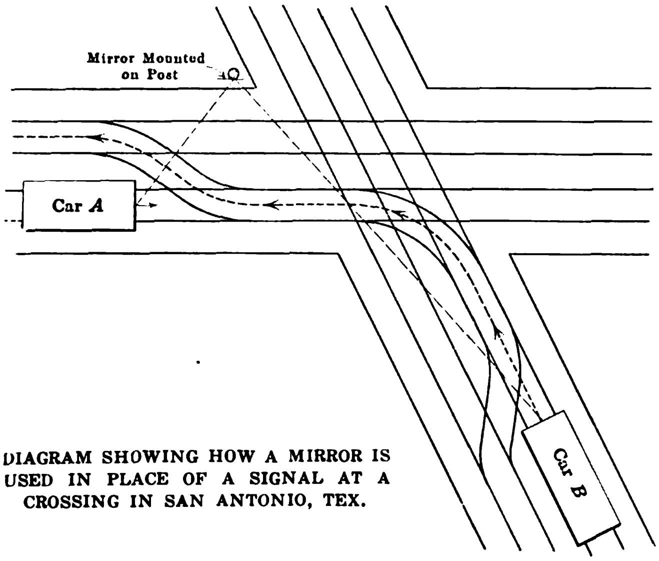
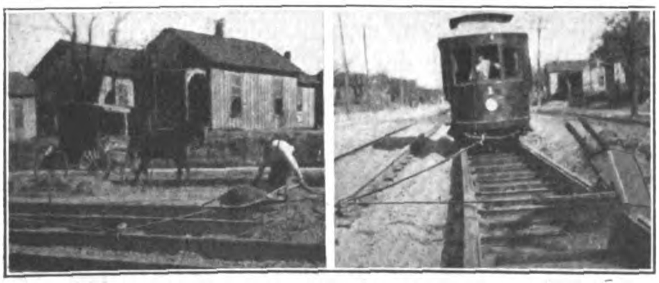


DIAGRAM SHOWING HOW A MIRROR IS USED IN PLACE OF A SIGNAL AT A CROSSING IN SAN ANTONIO, TEX.

The mirror is 30 in. x 45 in. in size and is protected by a wire screen. It is mounted on a post using two turnbuckles to provide for easy adjustment.

Electric Shoveling

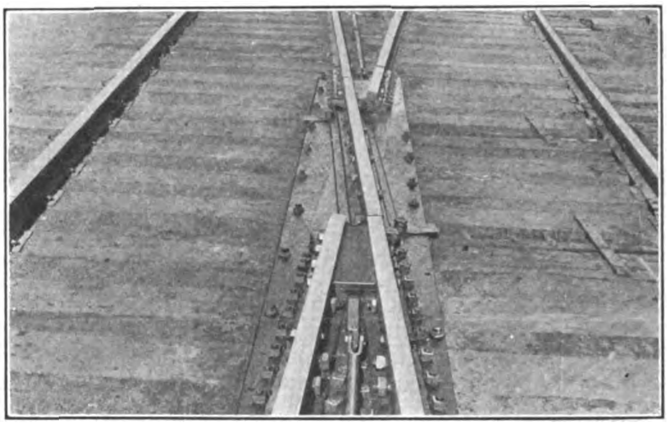
Shoveling with the motive power of a street car reduced the cost from 12 cents to 5 cents per yard on about 2200 ft. of double track in Dallas, Tex. R. G. Taber of the Stone & Webster organization, general managers of the Consolidated Electric Street Railway, was in charge of electrically welding a section of new track. As the car used for transporting the welding outfit remained idle most of the time Mr. Taber conceived the plan of putting it to work. He fastened a rope to a scraper as shown in the accompanying illustrations, passed it through a pulley which was hooked over the rail and tied the other end to the car. The scraper was taken out beyond the dirt which was piled on both sides during the laying of the track. Then the car was started and the scraper was pulled in toward the track, gathering a load as it came. The cost mentioned above covered everything (including the motorman's wages) except the power used by the car.



STREET CAR USED TO PULL SCRAPER IN DALLAS, TEXAS

Frogless Switch Makes Continuous Rail for High-Speed Track

A mechanism for eliminating the break in the rail and the two pieces of guard rail necessary, and to form a continuous rail at a switch, has been developed by the Walls Frogless Switch & Manufacturing Company, a Colorado corporation of Kansas City, Mo. This consists of a section of rail which is made to take the place of the usual frog, and which is turned with the switch point to form a section of either the main-line track or the switch track. This section of swing rail is 7 ft. long and rests on a plate of steel carried on the track ties. As the section of rail is thrown with the switch point to either position, it is locked on both sides of either end to prevent it moving while a train or car is passing over it. One of these locks at each end is affected by inserts in the bearing plate, and the other by means of a rod running parallel with the rail and contained in a housing, which inserts a bolt at either end, the combination affecting five locks in 7 ft. of rail. The steel plate under the frog is 15 ft. long, taking care of the bearing area for the 7-ft. rail section and supplying 3 ft. anchorage at either end leading onto the frog. Expansion and contraction are taken care of by mounting a short section of rail at each side of the swing section, and then as rail and bearing plate expand or contract, no difficulty is had with the rails binding.



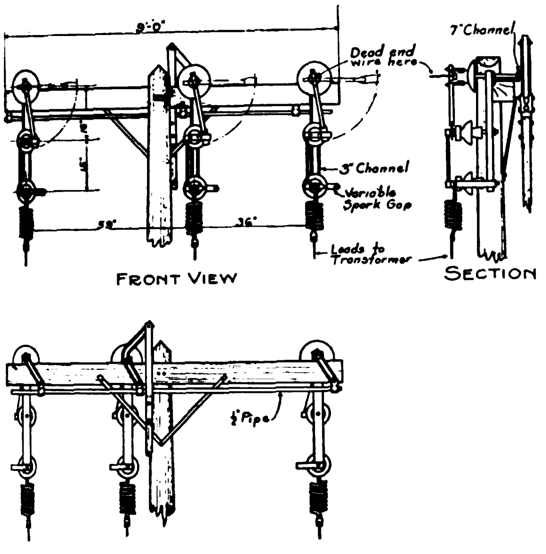
FROGLESS SWITCH INSTALLED ON SANTA FÉ RAILWAY TRACK

Thermo-Couple and Potentiometer for "Hot Spot" Temperature Measurement

The importance of knowing the temperature of the hottest part in electrical machines is now well recognized. An accurate and reliable method of measuring temperature in parts inaccessible to thermometers is by means of a thermo-electric couple. The practice of building such couples into the windings of large machines at points where the highest temperatures are reached, though of comparatively recent origin, is fast becoming standard. For measuring the temperature at a point where a thermo-electric couple has been installed a potentiometer is utilized. This instrument balances the electromotive force of the couple under test against that of another couple at a known temperature. This avoids all errors due to variation in resistance of leads, etc. As all indications are on the zero-reading principle, very accurate readings can be obtained. A handy set for this purpose made by the Westinghouse Electric & Manufacturing Company combines in one case a standard couple and a potentiometer.

Pole-Top Switch

Low cost, simplicity and ruggedness are the claims of the makers. the K. P. F. Electric Company, San Francisco, for the switch shown herewith. This switch is fabricated from structural iron, and is then hot-dip galvanized. No clamps are used on the insulators, cemented caps being employed. The units are shipped from the factory in assembled form. To install them it is only necessary to bolt the three units to the crossarm and attach the line wires and control rods. The channel baseplate and the channel arm supporting the insulators are riveted together, and no amount of warping of the crossarm, it is claimed, can throw the switch arms out of alignment. While the three legs of the circuit are opened and closed simultaneously by means of the rear control rod, each pole of the switch is separate from the others and is self-contained.



POLE-TOP SWITCH CONNECTED TO FUSES AND CHOKE COILS

Creosoted Block Pavement Standardized

The chief defects of creosoted block pavement have been the occasional tendency to expand and buckle and the bleeding or exuding of oil caused by the blocks being improperly treated. While the character of the oil has frequently been held responsible for these defects, the method of treatment and the character of the timber of which the blocks are manufactured are of greater importance. The pressing need for a uniform standard for this pavement has been realized, and a specification has been adopted by the American Society of Municipal Improvements, Chicago, Ill. This specification has already been indorsed by five other leading engineering and municipal societies interested in this subject.

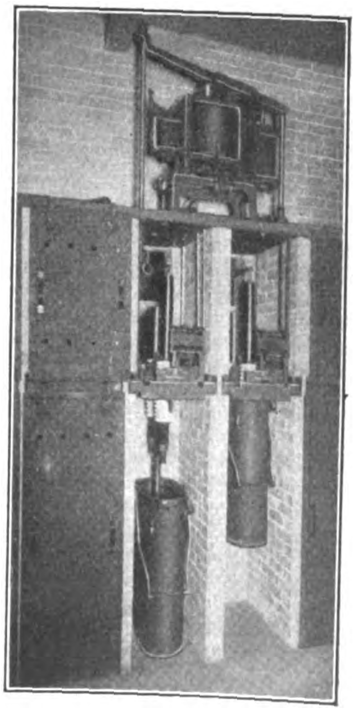
The vital points covered by the specifications are the timber, preservative compounds, treatment, and the method of laying the pavement. The quality of the timber is based on its density, and specific directions are given for measuring the number of rings in a definite distance and the determination of the percentage of summer wood in that region. The preservative specification allows the use of two types of oil, the first a coal tar solution consisting of a creosote oil to which a limited amount of refined coal tar is added, and the second a coal tar distillate oil the qualities of which are clearly defined. Careful descriptions are given of the methods of sampling and testing the preservative. The oils allowed include practically all the high-grade oils previously used in preservative specifications.

The treatment specifications state that the timber should preferably be only partly seasoned, and that green and seasoned timbers shall not be treated in the same charge. Approximately nine hours is the length of treatment required to give a uniform distribution of the oil. The need of an adequate preliminary steam treatment with proper time and temperature limits is also emphasized.

In laying the pavement sand gives too yielding a base when used as a cushion, and as a filler it allows water to get under the paving, thus causing swelling and consequent buckling. This can be prevented by the use of a bituminous filler. A new method of construction is recommended in which a coating of coal tar pitch or other suitable water-proofing paint is applied in a thin coat over a smooth base of concrete. The wood blocks are placed upon this coating within at least thirty minutes of its application. The specification as a whole has received the best thought of many authorities, and if consistently followed there is little doubt that most of the troubles charged against wood block pavement will be eliminated.

Circuit Breakers for High Voltage

The circuit-breaker illustrated herewith is one of a line recently developed by the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa. These breakers range in capacities from 300 to 1200 amp. at 23,000 volts, and from 1600 to 2000 amp. at 16,600 volts. All-steel construction is used, rendering them compact for their rupturing capacity. They are made up of single poles mechanically connected so as to permit spacing according to local conditions. For cell mounting, the steel base of each pole unit is held in channel irons built into the cell walls and the single pole solenoid is mounted with its mechanism on a plate and channel frame fastened on top of the cell. To enable them to break the arc quickly the breakers are provided with accelerating springs. Adjustable air-cylinder dash-pots take up the shock of the moving parts at the full open position. The moving contacts are of the laminated-brush type and they are protected by butt-type arcing contacts of considerable size.



HIGH-VOLTAGE, HIGH-CAPACITY CIRCUIT-BREAKER MOUNTED IN CELL

Recently tests were made on one of these breakers by short-circuiting a 25,000-kva., 23,000-volt turbo-generator, five tests being made without external reactance in the circuit, five tests with 5 per cent 500-amp. reactance coils and six tests by short-circuiting the line at a substation 8 miles distant, the circuit including about 3 miles of cable. After the tests the breaker was opened for inspection, and there was no evidence on the arcing tips of excessive burning.

London Letter

Topics Discussed Mostly Those Growing Out of the War—Claygate Electrification Completed

(*From Our Regular Correspondent.*)

The Ashton-under-Lyne Corporation, in conjunction with the Waterloo and the Bardsley Parish Councils, recently took the first definite step towards acquiring the tramway system of the Oldham, Ashton & Hyde Electric Tramways, operated under private management for about twenty-five years. The Ashton Council decided to promote in the next session of Parliament a bill to make provision in respect to the purchase of the undertaking. Agreements were also confirmed with the Parish Councils of Waterloo and Bardsley for the transfer of their powers to the Corporation. The bill seeks to authorize the Corporation to construct additional tramways in the borough and to provide and run omnibuses. In the event of the bill being passed, it is hoped to establish through inter-running between Ashton and Oldham.

A bill will be promoted next session by the Nottinghamshire & Derbyshire Tramways to empower it to purchase the tramway of the Corporation of Ilkeston. The bill will confirm and carry into effect the indenture dated Nov. 5, 1916, between the Corporation and the company for the transfer of the undertaking.

The motormen of the Newcastle Corporation tramcars have made a request to the management for a cessation of work at 10.30 p. m. during the winter months. This is due to the excessive strain upon the men in driving the cars for so many hours in darkness, both morning and night. The committee is anxious to give due consideration to the men's request, and also to cause as little inconvenience as possible to the public and to the places of entertainment. The members of the tramway committee have discussed with theater managers the desirability of altering the hours of performances, with a view to meeting the changed conditions under which the tramway system is at present being worked.

The financial position of the Hull Corporation Tramway has necessitated several important changes. These will be made with the sanction of the City Council. Since the war all sailors and soldiers have had the free use of the cars, and the privilege has naturally been enjoyed to the fullest possible extent. Some time ago commissioned officers were asked to pay as ordinary passengers, and now it is proposed to charge the rank and file half-penny fares. Wounded men will still be allowed to use the cars free. In order to effect an economy in wear and tear, the tram service will be curtailed. The chairman at a recent committee meeting stated that it was estimated that for the year 1916-17 there would be a deficiency of £2,447. He also stated that there would have to be a revision of stages, and the abolition of penny through rides from extreme points of the service. Owing to the shortage of drivers, the manager had been empowered to introduce women drivers where advisable.

There is every prospect that passengers of the Liverpool Corporation Tramways will soon hear the stations announced automatically by a gramophone arrangement connected with an electro-magnetic route indicator. This ingenious contrivance is the invention of Mr. Mallins, the general manager of the tramway.

An application put forward by employees in the traffic section of the London County Council tramways for an increase of 15 per cent on all current rates of wages formed the subject of arbitration proceedings at the Chief Industrial Commissioner's Department, Westminster, recently. The claim was based on the ground of the higher cost of living, and more than 5000 workers were affected, including men and women conductors, and pointsmen. A concession of 2*s*. a week, in addition to the existing war bonus of 3*s*., and 6*d*. for each employee's child under fourteen years of age, was offered by the London County Council, but this offer was declined. At the close of the proceedings, which were conducted in private, it was announced that the decision of the arbitrators would be communicated to the parties interested after full consideration of the evidence laid before the tribunal.

Suggestions were made recently by local authorities that there is danger, during Zeppelin raids, from tramways and railways. The Field-Marshal Commanding-in-Chief of the Home Forces now points out that it is confidently believed that it is only necessary to assure the public that the continuance of railway and tramway traffic does not serve as a guide to hostile aircraft, and is of vital importance for the successful prosecution of the war for them to accept the decision and co-operate in carrying it out with loyalty and patriotism.

Stoppages are still taking place on the Birmingham Corporation Tramways, owing to lack of power. An endeavor is being made to give the necessary motive power for tramway purposes so as to enable a limited number of cars to be run on all routes throughout the day at times when the pressure of the factories is greatest. The matter has been referred to the Ministry of Munitions, whose local representatives are giving careful consideration to the question with the object of effecting an improvement in the supply of electricity to the tramways.

The electrification of the Claygate portion of the London & South-Western Railway's suburban lines has been completed, and a half-hourly service of electric trains between Claygate and Waterloo, covering the journey in twenty-nine minutes, has begun. There will be extra steam trains morning and evening.

One of the most interesting appointments to readers of this paper in the cabinet of ministers under the new Lloyd George Government, is that of Sir Albert Stanley to the post of president of the Board of Trade. Sir Albert has now a world-wide reputation as a most successful organizer, and for the past few years has been the managing director of the Underground Electric Railways, London. Brought to London by the absolute necessity of having a strong man to co-ordinate the services of the various underground railways and tube railways, Sir Albert has made a complete success of the whole system. Two years ago he was granted a knighthood, and now this further honor has been conferred upon him in recognition of his valuable services in connection with the transport problems of London. Sir Albert has already helped the Government in many ways connected with the transport problem at the front, and is now put in a position where his great abilities will be used to assist the whole country.

The business of the A. E. G. Electric Company, one of the three subsidiaries in England of the Allgemeine Elektricitäts Gesellschaft of Berlin, has been sold by the controller appointed by the Board of Trade to Dick, Kerr & Company, Ltd., London and Preston. The A. E. G. Electric Company was the most important of the three subsidiaries, and had offices and works in London, Newcastle, Cardiff and Birmingham. It had undertaken large contracts, and one of the reasons advanced for the continuance of its operations after the outbreak of war is understood to have been the importance of the work it had undertaken. The contracts varied in value from £1,000 to about £40,000, and the liquid assets held in this country amounted to more than £100,000. Before the war the company employed many German mechanics, and the whole of the capital was held by the parent company in Berlin. During the war the German staff is stated to have been replaced by a British staff, and the latter is now taken over by Dick, Kerr & Company, together with a number of uncompleted contracts.

It will be remembered that a short time ago Dick, Kerr & Company also obtained the control of Willans & Robinson, Rugby, who manufacture steam turbines, pumping and condensing apparatus, etc. They have also obtained control recently of the United Electric Car Company, Preston, with which they had a working agreement for many years. All of these businesses will now be entirely in the hands of Dick, Kerr & Company, who are gradually putting themselves into a very strong position to conduct the very largest kind of enterprises in any part of the world as soon as the opportunity arises. They will be in a position to control the manufacture of almost every piece of apparatus that can be installed in connection with the most elaborate electric power, electric tramway or electric railway enterprises, and by these consolidations will become one of the most important manufacturing and contracting companies in Europe.

A. C. S.

News of Electric Railways

Traffic and Transportation

Financial and Corporate Personal Mention Construction News

Extension of Line Ordered

Berkshire Street Railway Ordered to Complete Intra-State Connecting Link

The Public Service Commission of Massachusetts issued an order Dec. 30, 1916, requiring the Berkshire Street Railway to complete its Lee-Huntington line for service on or before July 1, 1917. The order answers a petition of the selectmen of five towns traversed by the line which was constructed under the provisions of Chap. 601, Acts of 1910, which authorized the purchase of the Berkshire company by the New York, New Haven & Hartford Railroad and required the building of this line among others as an incidental feature of the purchase. In 1912 the then Board of Railroad Commissioners extended the time of completion of this line from Jan. 1, 1913, to Jan. 1, 1914. No further extension of time has been granted by the commission or requested by the company.

The entire line, which is 23.86 miles long, was nearly completed three years ago. In December, 1915, the commission granted a certificate of operation for a section of the line 12.54 miles long, from East Lee to Otis. Soon afterward informal complaint was made to the commission because of the failure of the company to operate the entire line. In August, 1916, the board authorized the company to operate an additional 3800-ft. section. The company stated at a hearing before the board that it desires to postpone as long as possible the completion and operation of the section of the line from Algeree Four Corners, Otis, to Blandford, and that it had no intention or desire to complete and operate the remainder of the line from Blandford to Huntington, unless ordered to do so by proper public authority.

The attitude of the company was influenced by its financial condition and by the physical condition of the line. Construction has been difficult and costly in the hilly region traversed, about $3,000,000 having been expended. The company also claimed that the operation of the entire line would involve a financial loss which it ought not to be called upon to assume in its present financial condition.

The Berkshire company failed to pay its operating expenses and fixed charges in 1916 by more than $87,000. After every reasonable allowance had been made for any possible inflation in the company's capitalization or floating debt, it did not appear that the company's financial status was such as to justify the commission, under ordinary conditions, in requiring the company to assume an additional financial burden through the operation of an unprofitable line. This case differed, however, in important respects from a proceeding brought under the general law to compel a street railway to build and operate an extension of its existing lines. This line had already been substantially completed at an estimated cost of about $3,000,000. The obligation to build was definitely imposed by the Act of 1910, as one of the considerations for permitting the New Haven company, contrary to the general law and policy of the State, to acquire and hold the capital stock of a street railway. This legislation was actively sought by the New Haven company, not with any expectation that the operation of the Berkshire company would in itself prove profitable, but that the existing and projected lines of the Berkshire company would serve as feeders to the New Haven road, and would develop a large amount of long-haul business for the latter, which would be sufficiently profitable to offset any loss from the Berkshire property. The commission holds that the agreement of the two companies, evidenced by their acceptance of the act, raises what is virtually a contractual obligation to complete and operate the line.

Six of Ninety Contracts Unawarded

These Are All of the New York Contracts Unlet. Many New Lines to Open Soon

Only six general construction contracts out of ninety for the dual system of rapid transit remain to be awarded by the Public Service Commission for the First District of New York. Several important portions of the new lines will be placed in operation during the year 1917, adding materially to the present traffic facilities of New York. Several track installation contracts and station finish contracts for a number of stations remain to be awarded. These for the most part will be delivered during 1917. At the end of the year the Public Service Commission had completed or had awarded contracts for construction work on the new lines to be owned by the city of New York aggregating $196,278,900. In addition, expenditures had already been made or authorized to the amount of nearly $15,000,000 for real estate in connection with rapid transit work. Portions of this real estate, however, will be resold.

Exclusive of the above expenditures, the Interborough Rapid Transit Company and the New York Municipal Railway Corporation, which will operate the new rapid transit lines, entered into contracts and agreements involving large amounts in connection with rapid transit work. While exact figures are not at hand as to the amounts involved, it is roughly estimated that the two companies had expended and were under obligation to the amount of $35,000,000 all told for construction work upon company owned lines, making the total of construction contracts let by the city and the companies for all work about $231,000,000. In addition, the two operating companies will contract for $20,000,000 of equipment which they must supply.

Among the city owned lines which it is hoped may be placed in operation during the coming year are the Astoria and Corona extensions, the White Plains Road extension, the Jerome Avenue extension and a portion of the Southern Boulevard extension of the Lexington Avenue line, together with the main stem of the Lexington Avenue line, the Seventh Avenue Subway in Manhattan, and possibly a portion of the Flatbush Avenue and Eastern Parkway Subway in Brooklyn, for operation by the Interborough. The major portion of the Interborough lines will be in operation by the end of this year. Of the city-owned lines for operation by the New York Municipal Railway Corporation of Brooklyn, it is believed that a part and possibly all of the Broadway Subway in Manhattan will be in operation. Such operation will be in part a shuttle service south of Canal Street and a through service from Brooklyn by way of Manhattan Bridge and Canal Street north of Canal Street. Reports indicate that during the coming year the Second Avenue elevated line extension across the Queensboro Bridge and possibly the extension of the Ninth Avenue elevated line to a connection with the Jerome Avenue line will be placed in operation. New elevated facilities for operation by the Brooklyn company expected during the year are the third tracks on the Broadway line from Myrtle Avenue to Aberdeen Street, the Jamaica Avenue extension from Cypress Hills to Jamaica, and the third tracks on the Myrtle Avenue line between Broadway and Wyckoff Avenue.

Since the first of the year the third track on the Broadway line, Brooklyn, between Myrtle Avenue, Williamsburg, and Aberdeen Street, East New York, has been placed in operation for the use of express trains from Canarsie. Within the last few days there has also been opened for service the extension of the elevated lines on Jamaica Avenue from Crescent Street, Cypress Hills, to Grant Avenue, Woodhaven. This last extension is a section of the new elevated route from Cypress Hills over Jamaica Avenue to Jamaica.

Beaver Valley Traction Entertains

Christmas Reception Planned by Superintendent Boyce—Newspaper Participates by Sending Gifts

The sixth annual Christmas entertainment for the employees and families of the Beaver Valley Traction Company, New Brighton, Pa., was held on Dec. 20 at the pavilion at Junction Park, owned by the company. It was the biggest affair of the kind the company has held. The entertainment of the children, of whom there were more than 300, was a feature. W. H. Boyce, superintendent of the company, planned the affair and in carrying out the program he was ably assisted by Mrs. Boyce, J. E. McKirdey, advertising manager of the Pittsburgh Railways Company; Mr. Hay, president of the Pittsburgh section of the National Electric Light Association, and others. An enormous Christmas tree strung with red, white and blue electric light bulbs, red and green papier maché rope, gilt and other brilliant ornaments, stood at the lower end of the dance floor, while hundreds of lantern-effect shades were draped over the lights of the room. The entire pavilion was strung with garlands and on every hand were cards bearing the inscription "We wish you all A Merry Christmas and A Happy New Year," signed by the Beaver Valley Traction Company.

The children were entertained royally for an hour and in turn sang Christmas carols for Mr. Boyce. Each received candy, a toy and a monkey-on-a-stick. Shortly after 5 o'clock the employees of the company, their wives, families and sweethearts arrived with their friends. As they came in each employee walked up to the tree and gave his name. Miss Blanche Moore, acting as clerk to Santa Claus, had a list of all the employees and the number of the package each was to get. In addition there was candy in boxes and boxed peanuts, the latter complimentary from *The Beaver Daily Times*. For each of the men of the company there was a handsome lapel watch chain. For the women guests there were necklaces of beads and other jewelry and ornaments. C. C. Shetterley, lessee and manager of Junction Park during the past season, also presented cigars to each employee of the company. Lunch was prepared for 700 persons. Shortly after 1 a. m., the employees who had been out all night with cars began to arrive. These belated arrivals received their gifts and were entertained with music. The company hung in its cars, over its own name, a placard, 19 in. by 13 in., in colors, on which was printed this Christmas sentiment "We wish you All a Very Merry Christmas and a Happy and Prosperous New Year."

U. S. Circuit Court Dismisses Strike Injunction

The United States Circuit Court of Appeals at Chicago, Ill., on Jan. 2 reversed the ruling of the United States District Court at Indianapolis, Ind., in the case of the Indianapolis Traction & Terminal Company, and dismissed the injunction against W. D. Mahon and other officials of the Amalgamated Association and the employees of the Indianapolis Traction & Terminal Company restraining them from calling a strike against the company. The Court of Appeals ruled that the District Court had no jurisdiction in the matter because the real parties at interest were both residents of the State of Indiana, and therefore the action should have been in the state court and not in the federal court.

The suit was brought in 1914 by the Guaranty Trust & Safe Deposit Company, Philadelphia, Pa., trustee under the mortgage of the Indianapolis Traction & Terminal Company, and was a suit on contract—that of the arbitration award which ended the strike of November, 1913. In the hearing before Judge Anderson of the United States District Court at Indianapolis, the plaintiff proved that a strike in violation of the arbitration award was imminent, and the defendants, who included members of the street railway men's local union and officials of the Amalgamated Association, offered no testimony.

When the matter of the threatened strike was first brought before Judge Anderson in September, 1914, he declined to issue a temporary restraining order ex parte. He called the attorney representing the union and asked that it guarantee that no strike would be called that night, but when the attorney refused to assure the court that the contemplated strike would be held in abeyance until a hearing, Judge Anderson then issued the restraining order. Two months later, proof of the threatened strike having been given at the hearing and no evidence being offered by the defendants, the temporary injunction was issued. An appeal was then taken by the unions to the Circuit Court of Appeals, but no decision was handed down by the Court of Appeals until Jan. 2, 1917. The court held that the bringing of the action in the name of the Guaranty Trust & Safe Deposit Company, Philadelphia, and omitting the name of the Indianapolis Traction & Terminal Company as a party plaintiff was not the proper procedure.

Town to Help Complete Railway

Massachusetts Municipality Shares Construction Cost for Completing County Street Railway

The Public Service Commission of Massachusetts has concluded an investigation of plans for completing the Plymouth & Sandwich Street Railway, under which the town of Plymouth shares in the construction cost of the road. By Chap. 95, Acts of 1911, the town was authorized to purchase securities of the road to the amount of $50,000 to facilitate building the railway, which is to serve sparsely settled territory in the Cape Cod district. The town was not allowed to subscribe, however, until the commission had found that reasonably sufficient financial arrangements had been made to permit the completion of the line. The company now petitions the commission to enter such order as may be necessary to authorize the subscription by the town. A portion of the line 6.15 miles long, from Plymouth to Fresh Pond, has been completed, a further portion, 1.85 miles long, between Sagamore Beach and the Cape Cod Canal, has been built but not as yet operated; and there remains to be completed 9.9 miles, between Fresh Pond and Sagamore Beach and between the Cape Cod Canal and the Bourne-Sandwich line.

On Dec. 6, 1916, there remained only 1.47 miles of track construction to be done. The company has three single-truck open cars, two single-truck box cars and one double-truck box car. It now has an agreement with the Brockton & Plymouth Street Railway for the joint use of the latter's tracks to Plymouth, and expects to arrange for the use by the Brockton & Plymouth of the new track to Sagamore. At present the company has a carhouse of five-car capacity at Manomet, but plans to build a carhouse of eight or ten-car capacity in 1917 at Sagamore. Power is purchased from the Brockton & Plymouth Street Railway, but a connection will be made with the system of the Southeastern Massachusetts Power & Electric Company near Sagamore. The assets of the company on Oct. 31, 1916, totalled $360,651. The banking house of Hodgdon, Cashman & Company, Boston, has agreed to underwrite the construction notes of the company sufficiently to cover the contract price. In this case it has been urged that the words "reasonably sufficient financial arrangements," as shown in the statute, are equivalent to the words, "reasonably sound financial arrangements," and that the commission cannot properly issue the desired certificate if it appears that the construction of the road has been or is being financed largely by the creation of floating indebtedness and without the issue of stock sufficient in amount to insure a reasonable measure of financial stability to the enterprise. In the judgment of the board, the Legislature was endeavoring to insure, not the financial stability of the company, but the completion of a railway between Plymouth and Sandwich.

From the beginning it appears that the town of Plymouth has desired an opportunity to invest in the undertaking, not so much in the hope of securing a direct return upon the investment as to obtain the advantages of railway connection to the coastal territory lying immediately to the south, which included a region of summer-vacation popularity. The town was the petitioner for the above legislation. The commission certifies that reasonably sufficient financial arrangements have been made to permit the completion of the road.

Cleveland Power Contract Finding

Board of Arbitration Decides in Favor of Railway Purchasing Power from Illuminating Company

The board of arbitration selected two months ago to pass upon the Cleveland power contract made public its decision on Jan. 2. The board approved the power contract between the Cleveland Railway and the Cleveland Electric Illuminating Company. The plan of the railway to scrap its Cedar Avenue power house and build a substation at a cost of $250,000 was also approved. The decision on the latter points was announced some time ago. The cost of power to the railway under this contract will be less than 6 mills per kilowatt hour, according to the estimates made by the engineers at the hearings. The board stated that it considered the Illuminating Company's bid the lower of the two and the best under the circumstances.

The report stated that the bid of the local municipal light plant had not been approved by the board of control, as required by law; that it contained statements to the effect that the proposition was tentative and to be used as a basis for a more formal contract, and that it would be necessary to agree on conditions if the bid proved satisfactory. One of the principal reasons for the rejection of the municipal plant's bid was that the question as to whether it should be accepted was not included among those upon which the board was asked to pass. Moreover, the municipal plant proposed to furnish only the power which had been generated heretofore at the Cedar Avenue power house of the railway. This amounted to about 50,000,000 kw.-hr. per annum. The contract was arranged to extend over a period of ten years.

On the other hand, the Cleveland Electric Illuminating Company agreed to furnish not only this amount of power, but to continue that already being furnished to four substations, and as much more as may be required. The contract with this company is to cover a period of eighteen years. At the end of five years, however, the railway may receive competitive bids for the remainder of the term and if any bid received is 10 per cent lower than the price paid to the Illuminating Company and so low that this company will not meet it, then the railway may abrogate the contract on a year's notice.

The report said that if the primary and secondary charges alone were considered, the bid of the municipal plant for the service heretofore furnished by the Cedar Avenue plant was probably lower than that of the Illuminating Company. The municipal plant, however, could probably not furnish this power before July 1, 1918, while the Illuminating Company can furnish it by July 1, 1917.

There was considerable discussion of the clause by which the railway agreed to pay a certain proportion of the additional cost of coal above $2.25 per ton. The board criticized this, but said that the objections to it were not sufficient to overcome the advantages of other features of the contract. It recommended a modification of a clause relating to handling coal, and this will be made.

The reproduction value of the Cedar Avenue power house was placed at $1,265,565, and this, less the salvage of machinery and equipment estimated at $115,565, is to be placed in a suspense account and paid off at the rate of $20,000 a month.

It is estimated that the saving by buying the power heretofore furnished by the Cedar Avenue power house will be about $200,000 a year. The cost of production at the Cedar Avenue plant of the Cleveland Railway has been around 1 cent per kilowatt hour.

The report was signed by A. F. Ingersoll, chairman of the board and Warren Bicknell the member selected by the railway. Thomas L. Sidlow, the member selected by the city, brought in a minority report, in which many points of the majority report were discussed and criticized. He recommended the approval of the bid of the municipal plant as the more advantageous in every respect.

The total cost of the arbitration was $24,053. The arbitrators were awarded $5,000 each. Joseph Alexander, first selected by the company to represent it and afterward incapacitated by accident, received $1,000. The fees of city witnesses amounted to $4,665, while those of the company's witnesses were $858. The stenographer received $2,530.

Connecticut Company Review

Present Financial Condition Makes It Impossible for Company to Extend Service

The Connecticut Company, New Haven, Conn., in a brief which has just been filed with the Public Utilities Commission, announces that its present financial condition makes it impossible for the corporation to extend its service through Centerville, for which a petition was filed recently. The brief answers a petition for service in Hamden. The final hearing on the petition of the Hamden residents was held before the commission a few weeks ago.

The brief explains that the trustees of the Connecticut Company do not hold office in the same manner that the board of directors of street railways generally do. The men who handle the Connecticut Company affairs were appointed trustees of the property by the federal court and the tenure of office ends in 1919, giving them about two and a half years more service. The company said in part:

"Under these circumstances the trustees may very properly hesitate to make arrangements for the permanent financing of the company. The directors have followed the policy that the extraordinary expenditures be made out of current expenses, rather than permanently to finance the company and use the proceeds for the capital account. This policy has led the trustees to declare extremely small dividends during the last two years, paying last year a 1½ per cent dividend and the year previous, 1 per cent.

"It does not seem out of place at this time to mention a few of the larger expenditures which have been made during the past year, or are to be made during the present fiscal year, and the expenditures which have been recommended by officials but have not been approved by the board of directors at the present time.

"During the past year it has been necessary greatly to increase the capacity of the power houses in New Haven, Bridgeport and Hartford, upon which account is being spent the sum of $900,000. The carhouse in Waterbury is to be extended and rebuilt, for which an authorization of $200,000 has been granted. The building of bridges that are now under construction will result in a cost of $250,000 this year and bridges in contemplation will add $100,000 more to this account. For new passenger equipment it has been necessary in the last two years to form equipment trusts amounting to $1,100,000, which must be paid within five years. Paving of streets has averaged for the last three years an expenditure of $400,000 a year.

"Recommendations have been made by officials of the company for necessary carhouses, inspection barns, repair shops in various cities at an expenditure estimated at $1,150,000. These latter are very necessary in order to provide accommodations for the additional equipment.

"During the last five months of this fiscal year the total operating expenses have increased 31.58 per cent over the same period of last year. The gross earnings, however, have increased only 13.74 per cent, so that the net earnings have shown a decrease of 14.30 per cent, due to the enormous increase in the cost of maintenance and labor."

Report on Dorchester Tunnel Extension

The Boston Transit Commission has filed a special report in the Legislature relative to the extension of the Dorchester tunnel from Andrew Square to Upham's Corner. At the last session the commission was ordered to report upon the cost and most feasible route, and it finds the former to be about $2,800,000, via Boston Street, Edward Everett Square and Columbia Road, the distance being about 1 mile. An accompanying report by Chief Engineer Edmund S. Davis states that the present terminal at Andrew Square includes about 620 linear feet of two-track tunnel extending southerly from the station for cross-over facilities. The extension from this point to Upham's Corner would terminate at a station 350 ft. long with a lobby above the track level and the necessary entrances and exits. South of this station the usual cross-over facilities would be provided. The estimate takes into consideration the advanced cost of labor and material, the cost of the subway and station, including location of water pipes and sewers and land damages.

Lease Negotiations in Cincinnati

In a letter to E. W. Edwards, president of the Rapid Transit Commission of Cincinnati, Ohio, on Dec. 27, W. Kesley Schoepf, president of the Cincinnati Traction Company, expressed a willingness to enter into negotiations for the lease of the proposed rapid transit loop on the basis of a general proposition which had been presented to him. Mr. Schoepf said he would not object to a new franchise for his company, as proposed, on condition that it is so drawn as to leave no doubt as to its legality and to its practicability from a financial standpoint.

Instead of basing the returns on the net earnings of 1916, however, Mr. Schoepf made the counter-proposal that 1914, 1915 and 1916 be used for this purpose. He also said the company should deduct an amount equal to its 6 per cent franchise tax, before a division of any balance was made with the city, and he further contended that the percentage tax should not exceed the present payments. The company would agree to operate the loop as a part of a unified system, with universal transfers, entrance for all interurban lines, regulation of service and rates of fare, the city's right to order extensions and the fixing of a valuation for the purchase of the company's property by the city. Mr. Schoepf suggested that the zone of the 5-cent fare be limited to the present area. Through City Solicitor Charles A. Groom the canal lease secured by the city has been modified in such a way as to allow its use under somewhat different specifications than originally intended. It permits the city to build the rapid transit loop from 100 ft. beyond Brighton bridge to 300 ft. beyond Mitchell Avenue as an open way or on the surface instead of constructing it as a subway, as originally intended.

New Franchise Conditions in Gary

Proposed Substitute Grant Would Eliminate 3-Cent Fares and Make City a Partner

The segregation of the properties of the Gary & Interurban Railroad into its former constituent parts and a share of the net profits to the city of Gary, Ind., are provided for in a new franchise before the Council of that city. In return, the city of Gary will repeal the former fifty-year grant which exacted a 3-cent fare and grant a new thirty-year franchise. Should the company break faith with the city, the 3-cent fare will become operative again.

The segregation will restore the identity of the Valparaiso & Northern and the Chicago, Goshen & South Bend and connecting lines. The city of Gary demands that all lines east of Broadway in Gary be operated as separate companies. There is no objection to the old Gary & Interurban Railway, which also operates in Tolleston and Hammond, and the old East Chicago City Railways being one line.

Other conditions in the tentative grant provide for the addition at once of twenty modern pay-as-you-enter cars for service in Gary, all future track to be laid with 85-lb. rail, extensions of the road to new plants and to new sections of the city.

Plan to Consolidate Massachusetts Commissions

A struggle in the Legislature is forecasted by the recent action of Representative Allen of Newton, Mass., in filing a bill in the House providing for the consolidation of the Public Service Commission and the Gas & Electric Light Commission. Instead of the present boards aggregating eight members the bill provides a single body of seven members, to be appointed for terms of seven years at salaries of $7,500 each, with the exception of the chairman, whose compensation will be $8,000. The bill provides for the appointment by the chairman of four sub-boards of three members each, to deal respectively with steam railroads and steamships, street and elevated railways, gas and electric light companies, telephone and telegraph companies. The chairman and secretary of the commission are to be appointed by the Governor, the chairman having power to appoint the sub-boards and to name the chairman and secretary of each. According to the bill the decision of the sub-board is to be the decision of the commission. Previous efforts to consolidate the two commissions have failed on account of the absorption of both boards in their duties and the unbroken and successful regulative history of the Gas & Electric Light Commission in its particular field of service.

President House on Indefinite Leave

After Brief Rest He Will Study and Report to the Company Methods in Use Elsewhere Than Baltimore

At a special meeting of the directors of the United Railways & Electric Company, Baltimore, Md., on Jan. 3 William A. House, president of the company, was voted an indefinite leave of absence, and Thomas A. Cross, the vice-president, was selected to perform the executive duties while Mr. House is away. The official statement issued by the board follows:

"William A. House, at his request made to the directors of the United Railways & Electric Company, has been granted a leave of absence from official duties in order that he may secure, first, complete rest, after which he will engage in an investigation of the operation of a number of street railways in other cities. During his absence Mr. House will continue as president, but his duties will be performed by the vice-president, Thomas A. Cross.

"The directors realize that with the rapid industrial expansion of our city the company will be confronted with many serious problems of operation, and it is the desire of the directors that the company be in a position not merely to meet requirements, but to lead and assist in an intelligent policy of expansion and development.

"In order that they may have before them a thorough and competent study of what has been done elsewhere in the intelligent development of facilities to meet similar situations, the directors have decided to have made a report which will embrace the work done in most of the other large centers in this country.

"In considering means of making such a survey of the work elsewhere, different engineering firms were under consideration, but it was finally decided that it would be more satisfactory to have the report made by a man familiar with the local situation. The man pre-eminently fitted to make such a report is William A. House. Mr. House has been connected with the United Railways for the past thirty-five years, during which time he has not only seen the development of the company from a comparatively small beginning to its present magnitude, but during this time has been an important factor in the development and expansion of the company.

"In order to facilitate this work, and realizing that the exacting duties of the president of the company during the past years have taxed the strength of its president to the limit, and in order that he may be prepared to make the extensive tour of the larger cities involved in making the report in question, the directors of the company have granted a leave of absence to President House.

"It is the intention of the president for the first month to take a complete rest. The directors insisted that this should be done before his new duties were assumed. After his rest he will begin the inspection and examination into the railway situation in other cities. With the assistance of the report that will be made by President House, the directors of the company expect to develop comprehensive plans looking to meeting the future requirements of the local railway situation."

Toronto Carhouse Destroyed By Fire.—A fire broke out in the east carhouse of the Toronto (Ont.) Railway on the Don River at 8.30 p. m., on Dec. 28, causing total destruction of the building and many cars which were stored in the carhouse at the time. The loss is unofficially estimated at $500,000. R. J. Fleming, general manager of the company, refused to make any statement until the officials had made a complete examination and determined the exact loss.

Aurora Carhouse Roof Collapses.—As a result of splitting a switch upon entering the carhouse in Aurora, Ill., one of the cars of the Aurora, Elgin & Chicago Railway jumped the track and knocked down one of the columns supporting the roof, and the south half of the latter caved in. The construction was undoubtedly strong enough to support the roof under ordinary conditions without one column, but the excessive weight brought on by 8 in. of snow and ice was probably responsible for the failure. The truss rods buckled, and the roof gave way, burying five cars in the wreckage.

Arbitration of Wages on Interurban Line.—The trainmen in the employ of the Chicago, Ottawa & Peoria Railway, Ottawa, Ill., have agreed to submit their request for increased wages to a board of arbitration. The present basis of pay is 24½ cents for first-year men, the scale then ranging to a maximum of 28 cents. The company offered the men a flat increase of 2 cents an hour for the first year with an additional increase of 1 cent an hour for the other years. The trainmen asked 25 cents an hour for first-year men and 30 cents and 35 cents for the other employees. The working conditions that exist, other than the wage scale, are satisfactory.

Hearing on Jan. 15 on Relief from Franchise Conditions.—The State Public Service Commission of Washington has fixed Jan. 15 as the date for a hearing of the petition of the Tacoma Railway & Power Company, Tacoma, to be relieved of certain of its franchise obligations, which include the paving of right-of-way, and the payment of 2 per cent of its gross earnings to the city, because of impaired revenues due to jitney competition, and other reasons. The case is identical to that instituted by the Puget Sound Traction, Light and Power Company, Seattle, except that the Public Service Commission has made a valuation of the Tacoma Railway system, while it has not valued the Seattle system.

Grand Rapids Railway Raises Wages.—The third increase within a year in the wage scale of the employees of the Grand Rapids (Mich.) Railway was announced on Dec. 24 by Benjamin S. Hanchett, president, to become effective on Jan. 1. The scale is raised 4 cents an hour, bringing the new rate up to 28 cents for the first six months, 29 cents for the second six months, 31 cents for the second year, and 32 cents for the third year. The notice of the raise called attention to the fact that the earnings of the company did not justify the action at this time, but that the living expenses of the men had increased so materially that the company felt it necessary to assist in alleviating the conditions.

High Cost of Materials May Endanger Fare at Cleveland.—Fielder Sanders, street railway commissioner of Cleveland, Ohio, said that a decision of the board of arbitration in favor of the Cleveland Railway in the power contract controversy will result in a saving of $200,000 a year to the company and that this will meet the constantly advancing cost of labor, materials and equipment. In case the company does not receive this relief, he said, the fare would almost inevitably have to be increased to 4 cents cash and three tickets for 10 cents. Mayor Harry L. Davis is quoted as saying the city is opposed to an increase in fare, but Commissioner Sanders has answered this with the assertion that there is nothing else to do but stand for it, if the interest fund falls below the limit at which the fare is to be increased automatically under the Tayler franchise provisions.

Increases in Wages in Tacoma and Seattle.—Employees of the Tacoma Railway & Power Company, Tacoma, Wash., to the number of more than 300, received a Christmas present in the form of a rearranged wage schedule providing increases in pay approximating 2 cents an hour above the old wage scale. The new scale of wages ranges from 23 cents an hour for the first six months, up to 30 cents for ten years and thereafter. Trainmen operating one-man cars receive 2 cents an hour in addition to the above rates. Gripmen on cable cars receive 1 cent an hour in addition to the regular schedule. Trainmen while breaking in students receive 2½ cents an hour in addition to the regular schedule. Seattle employees of the Puget Sound Traction, Light & Power Company, which also controls the Tacoma Railway & Power Company, also received a Christmas present in the form of a wage increase, effective on Jan. 1, when the scale was increased 1 cent an hour above what it formerly was, to be followed by an increase of another cent on July 1, 1917. Nearly 1000 employees of the company are benefited by the Seattle increase.

Extension of Bridge Approach Underground.—At a conference of the city-planning commission of Cleveland, Ohio, recently, the matter of extending the eastern subway bridge approach on Superior Avenue to the Public Square was discussed, and it was decided to make an investigation with that end in view. Under present plans the entrance to the subway will be at West Sixth Street. Members of the commission believe that, with a moderate expenditure, the subway could be extended to the Public Square. This would relieve congestion and allow the cars greater freedom of operation. Such construction is also regarded as a first step toward subways on the various streets approaching this point and an underground terminal at the square. County Engineer Stinchcomb told President Stanley of the Cleveland Railway, Street Railway Commissioner Fielder Sanders and members of the street railway committee of the City Council that the county will not recede from its position in refusing to pay one-third of the expense of re-locating the street railway tracks in order to allow the construction of the subways to the bridge to proceed. He said the city had agreed to take care of this matter.

Programs of Association Meetings

National Foreign Trade Council

The National Foreign Trade Council has called the Fourth National Foreign Trade Convention to meet at the William Penn Hotel, Pittsburgh, Pa., on Jan. 25, 26 and 27, 1917, to consider, among others, the following questions:

Conditions in Foreign Markets After the War, and the Measures Necessary to Safeguard American Foreign Trade, as Well as the Foreign Trade Aspect of the American Tariff System.

Co-operation in Foreign Trade Development.

The American Merchant Marine.

Foreign Investment of American Capital as an Aid to Oversea Commerce.

Problems of the Smaller Manufacturer and Merchant.

All Americans engaged in, or desirous of entering, oversea commerce are invited to participate.

The proceedings will be designed to bring out the mutual interests of the chief elements in foreign trade. In addition to prepared addresses by authorities on topics mentioned, the convention will be given over largely to "group sessions," each devoted to intensive discussion of a single problem, in which all delegates are at liberty to participate. R. H. Patchin, Hanover Square, New York, is secretary of the National Foreign Trade Council.

American Wood Preservers' Association

The thirteenth annual meeting of the American Wood Preservers' Association will be held at the Hotel Astor, New York, N. Y., on Jan. 23, 24 and 25. The association will convene on Jan. 23 with an address of welcome by Mayor Mitchel of New York. In the afternoon reports of committees will be presented as follows: Publicity, Promotion and Education, by E. A. Sterling, chairman; Service Tests of Ties and Structural Timber, by C. P. Winslow, chairman; Terminology, by J. B. Card, chairman.

On Jan. 24 reports of committees will be presented as follows: Plant Operation, by A. L. Kuehn, chairman; Preservatives, by E. B. Fulks, chairman; Purchase and Preservation of Treatable Timber, by A. R. Joyce, chairman. On the same day the following papers will be presented: "The Grouping of Ties for Treatment," by C. P. Winslow, and "The Bad and the Good in the Handling of Wood," by J. H. Waterman.

On Jan. 25 reports of committees will be presented as follows: Service Tests of Wood Block Paving, by L. B. Moses, chairman; Wood Block Paving, by C. H. Teesdale, chairman.

An informal banquet will be held on the evening of Jan. 24 at 6.30 p. m. Special entertainment features will be provided for the ladies on all three days.

Financial and Corporate

Foreclosure Proceeding in San Francisco

Suit was filed in San Francisco, Cal., on Dec. 27 by the Anglo & London-Paris National Bank, the Oakland Bank of Savings, and D. A. Bulmore, as trustee, to foreclose the mortgage on the property of the Market Street Cable Railway, under which are secured $1,800,000 of 6 per cent bonds. The defendants are the Market Street Cable Railway, the United Railroads, the Union Trust Company, which is trustee for junior mortgages, and others.

The apparent objects of the suit are to prod along the reorganization of the United Railroads, the bondholders of which are not readily responding to the plan, and to prevent the junior bondholders from pleading the statute of limitations against this issue of $1,800,000. It was believed in the San Francisco financial district that, with the filing of this suit, it becomes imperative on the part of the holders of the $28,854,000 of United Railroads 4 per cent blanket mortgage bonds which are junior to these underlying mortgages, to take active steps to protect themselves, either by depositing their bonds under the present plan, or formulating a plan of their own.

Annual Report

Municipal Railway of San Francisco

An advance statement of the annual report of the Municipal Railway of San Francisco, Cal., contains the following income statement for the fiscal year ended June 30, 1916:

Operating revenues		$1,982,804
Operating expenses		1,164,617
Net operating revenues		$818,187
Legal and clerical service	*$9,182	
Depreciation (18 per cent of gross)	352,075	
		361,257
Operating income		$456,930
Income from bonds owned		24,038
Gross income		$480,968
Deductions from income:		
Taxes, comparison charges required by charter	$103,855	
Municipal franchise	59,149	
Municipal car license	2,955	
Federal income	755	
		*166,714
Balance before interest		$314,254
Interest on funded debt		239,486
Net profit		$74,768
*Comparison charter charges as above		175,896
Profit for year		$250,664

According to the advance statement, presented by Superintendent Thomas A. Cashin, the system has been maintained at better than 80 per cent of its reproduction cost. He warns the city, however, that although the road has been earning a surplus, there must be a conservative policy in undertaking costly and unprofitable extensions.

Heavy drains have been made upon the earnings of the municipal system which must be borne in mind, he points out. From surplus earnings $48,000 was expended on the Stockton Street Tunnel; about $84,000 was used to help complete the Church Street line; $25,000 is being appropriated for five motor buses to operate across Golden Gate Park, and the track construction through the Twin Peaks Tunnel, which will be required within a few months, will probably cost $275,000. Thus a total of $428,000 has been taken bodily out of the earnings of the system. The Church Street line, for which a total of $500,000 has been spent, is not operating, and thus earnings are not accruing to defray interest on the investment. The Chestnut Street line, built to handle Exposition traffic, will not be profitable until the district is built up. Moreover, some of the crosstown lines which it is necessary to maintain are being operated at present in expectation of greater development in the future.

Bond redemptions, Superintendent Cashin adds, will increase this year from $100,000 to $202,000 annually, and as long as the system is required to pay its own way out of earnings and at the same time maintain a high state of efficiency, projected extensions and other expenses must be carefully watched if "the garment is to be cut according to the cloth." Although the complete financial report for the year has not yet been put in shape for circulation, it is stated that the net profit of the municipal line for the year is $74,768, after deducting state and municipal franchise, municipal car license and federal income taxes. In other words, the actual profits total $250,664, which amount is now actually in the city treasury.

Arkansas Valley Interurban Railway, Wichita, Kan.—The Arkansas Valley Interurban Railway has been authorized by the Public Utilities Commission of Kansas to issue $1,000,000 of first mortgage 5½ per cent gold bonds; $600,000 of preferred stock and $1,500,000 of common stock. The company is to retire $1,303,000 of bonds authorized by the Railroad Commission in 1910, using for such retirement the proceeds of $900,000 of the new bond issue and $500,000 of the preferred stock. The proceeds of the other issues are to go for improvements.

Bartlesville (Okla.) Interurban Railway. — Edward V. Kane & Company, Philadelphia, Pa., announce that the $250,000 of Bartlesville Interurban Railway first mortgage 6 per cent gold bonds, due July 1, 1934, which they placed in 1910, were called for redemption at 102 and interest on Jan. 1, 1917. The same firm has purchased a new issue of $350,000 of Bartlesville Interurban Railway first mortgage sinking fund 6 per cent gold bonds, dated Jan. 1, 1917, due Jan. 1, 1947, and redeemable any time at 102 and interest. Practically all the old bonds will be exchanged for the new issue. Bonds not exchanged will be offered to the public at 100 and interest. The new bonds are a first lien on railway, light and power property in Bartlesville, having a replacement value of $583,000 as compared with $350,000 of outstanding bonds. All of the stock of the Bartlesville Interurban Railway is owned by the Cities Service Company.

Boise (Idaho) Railroad, Ltd. — H. E. Dalton, general manager, has been appointed receiver of the Boise Railroad, Ltd., which operates 8 miles of local lines in Boise. A sale was ordered by the court for Jan. 3, at a minimum price of $182,000. The application for a receiver, which was made by the Germantown Trust Company, Philadelphia, trustee under a mortgage securing $389,000 of bonds, was noted in the ELECTRIC RAILWAY JOURNAL of Aug. 19.

Bristol (Tenn.) Traction Company.—Upon a hearing of the bill of complaint of the Munsey Trust Company, trustee, in a suit in chancery instituted against the Bristol Traction Company, Judge Roberts of the Corporation Court of Bristol, Va., on Dec. 8 appointed Fred Dulaney and Joseph A. Caldwell receivers of the company. The same action was taken in the Chancery Court in Bristol, Tenn. The deed of trust under which application for a receiver was made was executed to secure payment of thirty-year gold bonds aggregating $300,000, but the bill recited that bonds in the total amount of only $200,000 were ever issued, $7,500 of which the defendant itself owns. On Sept. 1, 1916, the defendant defaulted in the payment of the semi-annual installment of interest on the outstanding bonds of $192,500. The complainant filed as an exhibit to its bill a copy of a report which B. L. Dulaney, president, recently made to the board of directors of the company, showing that after paying taxes and interest on its bonds his company operated in both Bristols at a total loss of $8,652 during the fiscal year ended June 30, 1916.

Chicago (Ill.) City Railway.—The First Trust & Savings Bank and the Illinois Trust & Savings Bank, Chicago, Ill., have purchased an issue of $1,700,000 of first mortgage 5 per cent bonds of the Chicago City Railway. The proceeds from the sale of these bonds will be used to reimburse the company for improvements which have been made by it and for which the purchase price to the city is raised.

Chicago (Ill.) Elevated Railways.—Officials of the Chicago Elevated Railways have announced that the interest on such of the $14,000,000 of two-year 5 per cent secured gold notes of the company, dated July 1, 1914, as have not been extended under the terms of the extension agreement of June 19, 1916, will be payable at the office of the National City Bank in New York City for the six months ended Dec. 31, 1916, at the rate of 5 per cent per annum. It is stated that practically all of the notes have gone into the agreement.

Cincinnati & Columbus Traction Company, Cincinnati, Ohio.—The sale of the property of the Cincinnati & Columbus Traction Company, which was scheduled to take place on Dec. 19 at an upset price of $850,000, failed to be carried through on account of a lack of bidders. It is expected that the court will order a revaluation, and the property will again be offered for sale. Were it not for the unsettled condition of the loop question and an interurban right-of-way into Cincinnati, it is said, the stockholders would be prepared to buy in the property at once. The railway was placed in the hands of the Union Savings & Trust Company, Cincinnati, as receiver on account of flood damage in 1913.

Gary, Hobart & Eastern Traction Company, Hobart, Ind.—The application for a receiver in the case of the Gary, Hobart & Eastern Traction Company, noted a few months ago in the ELECTRIC RAILWAY JOURNAL, has been granted, Judge Wildermuth receiving the appointment.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—The application for a receiver for the Kansas City, Kaw Valley & Western Railway, noted in the ELECTRIC RAILWAY JOURNAL of March 11, 1916, was dismissed by order of the court, according to official information now available.

Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, Minneapolis, Minn.—Howard Abbott, master in chancery, has been ordered by Judge Wilbur F. Booth, in the United States District Court at Minneapolis, Minn., to sell the property of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company at auction on or before May 27, 1917.

Monongahela Valley Traction Company, Fairmont, W. Va.—An extra stock dividend of 6 per cent has been declared by the directors of the Monongahela Valley Traction Company on the $6,782,037 of common stock, along with the regular quarterly dividend of 1 per cent. Both of these dividends are payable on Jan. 15 to holders of record of Jan. 5. The regular quarterly 1¼ per cent on the preferred stock of the company has also been declared, payable on Feb. 1.

Nashville-Gallatin Interurban Railway, Nashville, Tenn.—The Nashville-Gallatin Interurban Railway has been placed in a receivership upon the petition of H. H. Mayberry, the controlling stockholder in the property, whose bill filed with the court alleged that interest due on July 1, 1916, on the $600,000 of first mortgage bonds of the road is in default. H. H. Corson and James R. West were appointed receivers, and creditors were ordered to file their claims before July 1 next. The receivers were authorized to issue $20,000 of 6 per cent receivers' certificates to mature in six months, and to use the proceeds to pay the bond interest to prevent foreclosure. It is believed, according to the bill of complaint, that a sacrifice of the property will be thus prevented, and that the company will be able to work out of its financial difficulties. The railway is 27 miles long from Nashville to Gallatin.

Northern Ohio Electric Corporation, Akron, Ohio.—The Public Utilities Commission of Ohio on Dec. 29 authorized the Northern Ohio Traction & Light Company to issue $1,000,000 of additional common stock, from the proceeds of which a number of improvements will be made. The new stock will be taken by the parent corporation, the Northern Ohio Electric Corporation.

Orleans-Kenner Electric Railway, New Orleans, La.—The application for a receiver for the Orleans-Kenner Electric Railway, made several months ago, was promptly thrown out of court. In connection with present advice to this effect, it is stated that the company is in fine shape and is doing well.

People's Street Railway of Nanticoke & Newport, Wanamie, Pa.—The application for a receiver for the People's Street Railway of Nanticoke & Newport, noted several months ago in these pages, is still formally in court, but there is said in official circles to be no reason why the property should be placed in receivership. The application was made by a few dissatisfied minority stockholders. The company is said to be in a very sound financial condition, interest on $73,500 of outstanding bonds always having been met as required, and liberal dividends having been paid on $100,000 of stock since 1910.

Pittsburgh & Butler Railway, Pittsburgh, Pa.—The Pittsburgh Trust Company was named on Jan. 2 as receiver of the Pittsburgh & Butler Railway. The railway defaulted in November, 1914, in the payment of interest on the $1,500,000 of first mortgage 5 per cent gold bonds of the Pittsburgh & Butler Street Railway of which the Pittsburgh Trust Company is trustee. Subsequent interest payments were not made and a bondholders' protective committee was appointed. The Pittsburgh & Butler Railway was organized in March, 1914, as a consolidation of the Pittsburgh & Butler Street Railway and the Butler Passenger Railway.

Sapulpa & Interurban Railway, Sapulpa, Okla.—The recent newspaper report that the Midland Valley Railroad, a steam line with main offices in Philadelphia, has purchased the Sapulpa & Interurban Railway is declared to be erroneous. The property of this 12-mile electric railway was foreclosed and bought in by the bondholders on Sept. 9 and the receivership was discharged. The former receiver, R. V. Miller, however, is still in charge of the property for the new owners. There will probably be a reorganization soon, but as yet nothing has been done. As far as is known, there is no probability that the Midland Valley Railroad will acquire the property.

Southern Traction Company, Inc., Bowling Green, Ky.—The application for a receiver in the case of the Southern Traction Company, Inc., made by a director a few months ago, has been denied, according to official information now at hand.

Steubenville & East Liverpool Railway & Light Company, Steubenville, Ohio.—In a joint application filed with the Ohio Public Utilities Commission on Dec. 26, the Ohio River Power Company proposes to lease that portion of the property of the Steubenville & East Liverpool Railway & Light Company which is utilized in carrying on the electric light and power business of the Ohio River Power Company. The proposed lease is to run until Oct. 1, 1919, at a rental of $90,000 a year, with the privilege of purchasing the property for $1,500,000. A notice of a special meeting of the stockholders of the railway and light company to act on the lease was published in the ELECTRIC RAILWAY JOURNAL for Nov. 18, page 1079.

Youngstown & Ohio River Railroad, Leetonia, Ohio.—An initial dividend of 1 per cent was paid on Dec. 21 to the holders of the common stock of the Youngstown & Ohio River Railroad of record of Dec. 16. The company also paid on Dec. 21 to holders of record of Dec. 16 a dividend of 1 per cent on the preferred stock on account of accumulations, together with the regular quarterly dividend of 1¼ per cent.

York (Pa.) Railways.—A dividend of 2½ per cent has been declared on the preferred stock of the York Railways on account of accumulations, along with the regular quarterly 1¼ per cent, both payable on Jan. 30 to holders of record of Jan. 20. The accumulations in dividends on this stock have now all been met.

Dividends Declared

Athens Railway & Electric Company, Athens, Ga., quarterly, 1¼ per cent, preferred.

Boston (Mass.) Suburban Electric Companies, 50 cents, preferred.

Capital Traction Company, Washington, D. C., quarterly, 1¼ per cent.

Citizens Traction Company, Oil City, Pa., quarterly, 1½ per cent, preferred.

Columbus, Newark & Zanesville Electric Railway, Springfield, Ohio, quarterly, 1½ per cent, preferred.

Dayton & Troy Electric Railway, Dayton, Ohio, quarterly, 1¼ per cent, preferred; quarterly, 1¼ per cent, common.

Mohawk Valley Company, New York, N. Y., quarterly, 1½ per cent.

Monongahela Valley Traction Company, Fairmont, W. Va., quarterly, 1¼ per cent, preferred; quarterly, 1 per cent, common; 6 per cent on common payable in common stock.

Rome Railway & Electric Company, Rome, Ga., quarterly, 1 per cent.

Stark Electric Railroad, Alliance, Ohio, 1 per cent.

Warren & Jamestown Street Railway, Warren, Pa., 3 per cent.

Western New York & Pennsylvania Traction Company, Olean, N. Y., 3 per cent, first preferred.

Western Ohio Railway, Lima, Ohio, quarterly, 1¾ per cent, first preferred.

West Penn Railways, Pittsburgh, Pa., quarterly, 1¼ per cent, preferred.

West Penn Traction Company, Pittsburgh, Pa., quarterly, 1½ per cent, preferred.

York (Pa.) Railways, quarterly, 1¼ per cent, preferred; 2½ per cent on preferred in full of all accumulations.

Electric Railway Monthly Earnings

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Earnings
BATON ROUGE (LA.) ELECTRIC COMPANY					
1m., Oct., '16	$18,509	*$8,319	$10,190	$3,532	$6,658
1 " " '15	18,096	*9,670	8,426	2,204	6,222
12 " " '16	208,536	*102,548	105,988	40,285	65,703
12 " " '15	187,957	*109,873	78,084	25,674	52,410
BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.					
1m., Oct., '16	$9,964	*$9,306	$658	$1,128	†$470
1 " " '15	9,405	*7,855	1,550	1,106	444
12 " " '16	121,336	*106,240	15,096	13,264	1,832
12 " " '15	115,316	*97,162	18,154	13,563	4,591
CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, NOVA SCOTIA					
1m., Oct., '16	$36,466	*$18,205	$18,261	6,568	$11,693
1 " " '15	34,152	*16,891	17,261	6,606	10,655
12 " " '16	387,757	*227,251	160,506	78,470	82,036
12 " " '15	347,773	*205,637	142,136	79,289	62,847
COLUMBUS (GA.) ELECTRIC COMPANY					
1m., Oct., '16	$84,786	*$30,405	$54,381	$28,572	$25,809
1 " " '15	67,214	*28,135	39,079	28,730	10,349
12 " " '16	847,466	*343,413	504,053	343,883	160,170
12 " " '15	706,911	*324,245	382,666	344,769	37,897
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.					
1m., Oct., '16	$72,130	*$37,862	$34,268	$8,759	$25,509
1 " " '15	71,664	*35,193	36,471	8,715	27,756
12 " " '16	817,842	*435,548	382,294	106,336	275,958
12 " " '15	694,754	*380,106	314,648	105,056	209,592
EL PASO (TEX.) ELECTRIC COMPANY					
1m., Oct., '16	$104,990	*$55,576	$49,114	$5,286	$44,128
1 " " '15	84,807	*43,932	40,875	4,202	36,673
12 " " '16	1,088,443	*633,775	454,668	56,891	397,777
12 " " '15	967,036	*515,683	451,353	50,371	400,982
GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.					
1m., Oct., '16	$171,761	*$107,012	$64,749	$36,858	$27,891
1 " " '15	174,258	*103,652	70,606	36,124	34,482
12 " " '16	1,929,671	*1,231,365	698,306	438,617	259,689
12 " " '15	1,992,280	*1,199,804	792,476	432,963	359,513
HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.					
-m., Oct., '16	$25,956	*$15,756	$10,200	$5,240	$4,960
1 " " '15	23,033	*13,053	9,980	5,522	4,458
12 " " '16	320,263	*181,911	138,352	64,478	73,874
12 ' " '15	268,003	*160,261	107,742	66,681	41,061
HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.					
1m., Nov. '16	$512,904	*$224,107	$288,797	$215,702	$73,095
1 " " '15	477,687	*197,256	280,431	212,253	68,178
5 " " '16	2,397,008	*1,084,185	1,312,823	1,075,132	237,691
5 " " '15	2,246,309	*956,673	1,289,636	1,059,286	230,348
JACKSONVILLE (FLA.) TRACTION COMPANY					
1m., Oct., '16	$49,646	*$34,930	$14,716	$15,437	†$721
1 " " '15	51,338	*35,896	15,442	14,735	707
12 " " '16	619,387	*422,793	196,594	182,308	14,286
12 " " '15	617,722	*431,913	185,809	174,675	11,134
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.					
1m., Oct., '16	$26,437	*$17,390	$9,047	$7,241	$1,806
1 " " '15	25,312	*15,336	9,975	7,511	2,464
12 " " '16	310,557	*203,171	107,386	87,075	20,311
12 " " '15	289,478	*180,484	108,994	91,595	17,399
PENSACOLA (FLA.) ELECTRIC COMPANY					
1m., Oct., '16	$21,439	*$12,319	$9,120	$7,714	$1,406
1 " " '15	22,385	*13,025	9,360	7,082	2,278
12 " " '16	279,557	*154,398	125,159	91,217	33,942
12 " " '15	249,556	*146,262	103,294	86,375	16,919
TAMPA (FLA.) ELECTRIC COMPANY					
1m., Oct., '16	$82,457	*$43,762	$38,695	$4,263	$34,432
1 " " '15	84,803	*42,938	41,865	4,212	37,653
12 " " '16	964,328	*527,078	437,250	52,269	384,981
12 " " '15	978,005	*498,264	479,741	52,503	427,238

*Includes taxes. †Deficit.

Traffic and Transportation

Decision in Grafton Fare Case

Commission Finding Contains Discussion of Economics of Country Line Transportation

The Public Service Commission of Massachusetts has reached a finding in the Grafton fare case, on the Worcester Consolidated Street Railway, to the effect that a reduction in rates is justified on this branch of the system radiating from Worcester. As the company, after conference with the commission, has agreed to furnish special tickets on the line good between the hours of 6 a. m. and 8 a. m. and 4.45 p. m. and 6.45 p. m., the petition of citizens of Grafton for lower cash fares is placed on file. The finding contains a discussion of the economics of transportation on country lines radiating from Worcester and is abstracted below.

The petitioners alleged that the fares charged by the company for the transportation of passengers through Grafton, viz., two fares of 5 cents each for passage in one direction, were excessive. The distance from Worcester City Hall to the end of the line in Grafton Center is 8.90 miles. From the City Hall a passenger can ride 4.79 miles for 5 cents, 7.47 miles for 10 cents, and 8.90 miles for 15 cents, without allowance for the transfer privilege at Worcester. The line in Grafton is 4.77 miles long and the fare is 10 cents.

The petitioners requested a reduction largely on the ground that the fares they are paying are relatively higher than those prevailing upon other and similar lines radiating from Worcester. On twelve routes out of Worcester the distance available on a 10-cent cash fare from the center of Worcester ranges from 6.04 to 10.33 miles, and on ten of these routes the distance available on a 15-cent cash fare varies from 7.98 to 13.3 miles. On the Holden route a concession is given in the form of 10-cent tickets good in the morning and afternoon rush hours between Holden and Worcester City Hall and giving a ride of 10.16 miles, by former order of the commission. There are no transfer privileges in Worcester with these tickets. Other tickets are in vogue on the Spencer and Bramanville lines. The commission held that the fact that the above inequalities existed was not conclusive evidence in favor of the petitioners. Similar apparent irregularities were to be found upon most of the Massachusetts street railways. Fares had been established strictly on a mileage basis, but had been influenced by other factors, such as the location of centers of population, municipal boundary lines and traffic density. Cost of service was by no means solely dependent upon mileage. An attempt to readjust street railway fares within the State upon a uniform mileage basis would mean revolutionary changes probably in general unsatisfactory to all concerned.

A tabular exhibit of maximum distances was likely to be misleading. Thus: if on a certain line the maximum distance for a 10-cent fare was 8 miles and for a 15-cent fare, 12 miles, the principal settlement in the 15-cent zone might be at the 9-mile point, so that very few local riders had the benefit of the maximum distance. The company contended that a situation similar to this existed on many of the routes radiating from the Worcester City Hall. On nearly all the suburban lines except the Grafton line very few persons lived in the vicinity of the 10-cent fare limit. Hence if that fare limit was extended for a considerable distance into the country on those lines, it would not materially affect the income of the company, as the through passengers would pay the fare anyway. A reduction of the fare to 10 cents in the case of the Grafton line would result in a very considerable loss for the street railway and give to persons located at the large settlement a privilege and advantage that was not accorded to any considerable number of people on any other suburban line. If the Grafton line did not end at Grafton Center, the 15-cent fare limit might be placed at a point more nearly conforming to the similar distances on the other routes without any real benefit to the people living at the Center.

The company paid dividends of 5.5 per cent on its stock in 1915 and 5 per cent in 1916. In this case no attempt was made, either by the company or the petitioners, to segregate investment in the Grafton line and pro-rate revenues and operating expenses so that the financial results from operation might be determined with approximate accuracy. It was claimed by the petitioners, however, that the line was one of the better paying suburban routes. The company did not refute this. The commission knew of no uniform and inflexible rule to apply with general public advantage in cases where comparative street railway fares were involved. The factors that apply were so numerous and varied that each case must be determined on its own merits. The commission found that an adjustment by means of special tickets was equitable. The company has agreed to furnish tickets good during the hours above mentioned at 10 cents each for the use of regular patrons traveling between any part of Grafton and the terminus of the line at Salem Square, Worcester.

Car Capacity Measure Amended

Board of Health Order Will Not Apply Where Full Track Capacity Is Utilized

Two years ago, through the initiative of Dr. S. S. Goldwater, then Commissioner of Health of New York, an order was issued by the Board of Health against certain car lines in the boroughs of Manhattan, Brooklyn and Richmond, forbidding them to carry in any car passengers to a number exceeding one and one-half times the seating capacity of such car. The application of the order led to strong denunciation of the board's orders and to a demand for their repeal. On the other hand, the Board of Health felt that the duties imposed upon it by the charter demanded that the efforts to improve the hygienic conditions prevailing in the transportation service be continued, to the end that the health menace might be reduced to the minimum.

In order that the department might have the advice and guidance of others experienced in this field, a meeting of the advisory committee on traffic sanitation was held in the office of the commissioner of health, on Dec. 15. At this meeting, there were present the Mayor, John Puroy Mitchel, Deputy Police Commissioner Guy A. Scully, City Chamberlain Milo R. Maltbie, Commissioner of Plant and Structures F. J. H. Kracke, Public Service Commissioner Henry W. Hodge, Daniel L. Turner, engineer of the Public Service Commission; Jacob C. Klinck, president of the Brooklyn Civic Club; J. S. Doyle, of the Interborough Rapid Transit Company; R. A. Shaw of the Brooklyn Traffic Committee of One Hundred; Alexander McKinney, William J. Millard, assistant corporation counsel; Max W. Weir, for the Merchants' Association, and Dr. John Franklin Crowell, for the Chamber of Commerce.

For the information and guidance of the meeting, attention was called to Sec. 1169 of the charter, which requires the Board of Health to aid in the enforcement of and, so far as practicable, to enforce all laws of the State applicable in New York City, to the preservation of human life or to the care, promotion or protection of health. Section 1172 of the charter empowers the Board of Health to amend the sanitary code and to publish therein additional provisions for the security of life and health in the city of New York.

After considerable discussion, the committee decided that overcrowding could be prevented to a very great degree if the full track capacity of all the lines was used, as far as practicable, to meet the demand of the traveling public. It was agreed that when the operating companies were using to the full all the available facilities which the public allows them, it would be unreasonable to demand that they exclude excess passengers from their cars. The committee suggested that the Board of Health meet this situation by revoking the existing orders and adding the following section to the sanitary code:

"'Sec. 306. Cars Not to be Overcrowded. The carrying of passengers on railroad cars in the city of New York shall be so regulated at all times that the number of passengers on any such car at any time shall not exceed one and one-half times the seating capacity of the car; provided, however, that the foregoing provisions of this section shall not apply when the full number of cars which shall have been ordered by the Public Service Commission to be operated on any line or part of a line are so operated; and provided, further, that the foregoing provisions of this section shall not apply, in the absence of such an order of the Public Service Commission, when the maximum number of cars which can be practicably operated on any line or part of a line are so operated.'"

The recommendations of the committee were submitted to the Board of Health at a special meeting held on Dec. 16, and the orders already referred to were revoked and Sec. 306, as just cited, was adopted as part of the sanitary code, to take effect immediately.

Storm Affects Traffic

Western New York Lines Tied Up—Cause of Delays Advertised

Traffic on electric lines throughout western New York was seriously delayed for several days following the freezing rain and heavy snow fall on Dec. 23, last. The sleet storm lowered wires and covered rails with heavy ice. No efforts were made to operate cars on the Buffalo & Lake Erie Traction line between Buffalo and points west, and several cars were abandoned along the line between Buffalo and Lackawanna. The schedules of the city lines in Buffalo were only partly maintained by the International Railway and service was completely suspended on several of the Niagara Falls local lines. Interurban traffic between Buffalo and Niagara Falls and Lockport was abandoned for a short time. Neglect on the part of the city to clean up the snow in the streets of Buffalo also caused much delay in operating lines.

In an effort to acquaint the public with causes of delay on the Buffalo city lines, the International Railway printed advertisements in the daily newspapers giving the time, place and cause for each delayed car. This departure on the part of the company caused much favorable comment. E. J. Dickson, vice-president of the company, also prepared a statement for the public which was printed in the daily newspapers giving the cause for the delays on the lines. He placed much of the blame for the delays on blockades caused by motor trucks, wagons, sleighs, etc., on the tracks.

Louisville Men Discuss Salesmanship

In presentation of their activities to them in the light of "Selling Rides," officials of the Louisville (Ky.) Railway have created much new interest in their work among the trainmen. The passengers are regarded differently than they used to be and the men are talking about the proposition some weeks after the meetings at which the subject was discussed. In the current issue of *Trolley Topics*, issued by the company, Motorman O. E. Allen is represented by the following on "Selling Rides":

"This is a subject composed of two small words but has a great meaning. It is an easy matter to sell something to eat, drink or wear, but when it comes to selling rides, it takes a first-class salesman to do business. We are up against hard competitors when it comes to selling rides, for we have many automobile owners who give rides away. Think what we would be up against if we were in a business selling groceries and our next-door neighbor was giving the same articles away. Do you think we would make many sales? When we make a sale let us do all in our power to make a satisfied customer and he will bring us more. If we sell a ride to one customer and he is dissatisfied he will not buy any more from us and will not stop there but will keep others from buying from us. I have noticed on several occasions where I was in sight of a station a passenger standing there; when the car approached within 100 to 150 ft. a machine would come along, and the man would get in; sale gone, not 5 cents either, but sometimes 25 or 30 cents. (Mr. Allen is on a country line.) Dissatisfied customers or bad salesmanship may be the cause of losing sale of the ride. Now let us all devote our energy to our sales and when we make a sale let it be a satisfied sale. Use all the politeness we have, especially to the aged and infirm, and see what an improvement it will make."

Buses for Municipal Railway

Announcement has been made by the Board of Public Works of San Francisco, Cal., that sealed proposals will be received on Jan. 31 for furnishing the city with from five to fifteen buses for uses in the transportation of passengers in conjunction with the Municipal Railway System. It is stipulated in the specifications that the actual seating capacity of each bus shall be nineteen passengers, with a total carrying capacity of thirty passengers.

The proposals which have been sent out also call for bids for the maintenance and upkeep of buses ordered by the city during a run of 125,000 miles. As the estimated daily run of each machine will average about 125 miles, this means that the successful bidder will be obliged to maintain the upkeep of each machine taken by the city for a period of about three years. The estimated cost of the machines is about $5,000 each.

While the original idea was to purchase only sufficient buses to operate across Golden Gate Park into the Sunset District from the present Tenth Avenue terminal of the Municipal Railway System, the proposition advanced by the Harbor Commission that the city operate a line along the harbor front over a smooth roadway to be constructed by the State may mean the purchase by the city of the full complement of fifteen machines.

Fall River Ticket Withdrawal Postponed. — The Public Service Commission of Massachusetts has issued an order postponing the proposed withdrawal from sale by the Bay State Street Railway of strips of six tickets for 25 cents in the city of Fall River until Feb. 1, 1917.

Low Freight Damages of Louisville Interurban Line.—Losses and damage charges against the freight service of the Louisville & Interurban Railway, Louisville, Ky., are less than one-fifteenth of 1 per cent of the receipts. R. H. Wyatt, general freight agent of the company, is quoted as claiming that this record cannot be excelled by that of any other similar service.

Windows Replace Curtains in San Francisco Cars.—The curtains which have thus far been used to protect the open sections of cars of the San Francisco (Cal.) Municipal Railway, have been replaced by glass windows. This change excludes rain and has decided advantages over the fully inclosed cars, which are not so popular. The change is costing about $40 a car.

Kansas City Rate Hearing on Feb. 15.—A hearing on suburban street railway rates on the lines of the Kansas City Railways will be held in Kansas City, Mo., on Feb. 15 by the Public Service Commission of Missouri. Because of a controversy over certain suburban rates, the company had asked the commission to take up the entire matter and establish a basis for future ratemaking on the suburban lines, possibly on the mileage plan.

Increase in Fare on New Jersey-Pennsylvania Line.—The Trenton, Bristol & Philadelphia Street Railway, Philadelphia, Pa., has placed a new schedule of fares in effect between Morrisville and Torresdale, Pa. The through trip fare between these two towns has been increased from 25 cents to 35 cents. The rate from Torresdale to Cornwells and Eddington remains unchanged, as does the rate from Bristol to Croyden, Eddington, Cornwells and Edgely.

Numbered Stops on Trenton Suburban Line.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., has had sheet-iron tags hung from the wires at about eighty stops along its Hopewell line. Each tag is numbered, and passengers now inform the conductor at what number they want to alight from the car. The signs also show just where the cars stop to take on passengers along the country districts. A number of old stops has been eliminated.

Tulsa Service Increased.—The Tulsa (Okla.) Street Railway has increased its service by placing conductors on all its cars. When the jitneys made inroads into the company's business several months ago, the company was forced to curtail expenses, and in addition to reducing the number of cars in operation the company resorted to one-man cars. Since the City Commission of Tulsa adopted adequate legislation for the jitneys the business of the Tulsa Street Railway has more than doubled.

Sliding Gates Considered for Manhattan Elevated Lines.—The Public Service Commission for the First District, New York, is attempting to get the Interborough Rapid Transit Company to improve the type of platform gate used on its trains on the Manhattan elevated lines. At a hearing held last week, George Keegan, assistant to the vice-president and general manager, promised the commission that he would within a short time submit drawings of a type of sliding gate to be placed on the outside of the cars which the company would be willing to install upon two or three trains for the purpose of experiment. Experts of the commission testified at the hearing that the installation of folding and collapsible gate devices on Manhattan elevated lines would undoubtedly serve to improve conditions materially.

Legislating Against the Dallas Jitney.—The jitney traffic ordinance drafted by the city attorney at the instance of the Mayor and the City Commissioners of Dallas, Tex., seems likely to be finally adopted. This ordinance, which is a general traffic law, provides that each jitney in Dallas shall give an indemnity bond in the sum of $2,500 to protect passengers and the public. The ordinance also limits the number of passengers to be carried by a jitney to its seating capacity. The demand for more stringent regulatory measures affecting jitneys arises from the numerous accidents. Since Jan. 1, 1916, two persons have been killed, forty-five persons seriously injured and 173 persons slightly injured. It is estimated that more than 100 minor accidents were not reported to or by the police. The jitney drivers declare that the ordinance will put them out of business. They maintain that the cheapest bond which will meet the city's requirements will cost them $250 a year. The jitney driver now pays annual fees of approximately $100. This he considers prohibitive.

Discharges Follow Inability to Sense Organization Spirit.—The Kansas City (Mo.) Railways has during the eleven months since the new organization took charge, gradually installed many features of welfare work, insurance, social intercourse, athletics, and safety, in addition to the departments that make for greater efficiency in maintenance and operation. In each case of thoughtful provision for the personal good of the employees, the response has been grateful and immediate. The ideals of the company having been pretty thoroughly disseminated, the time arrived when the problem presented itself of dealing with those who did not and could not respond to these ideals. As a first move the company in December discharged sixteen men, most of them for violation of the spirit of the safety rules. These were all cases wherein it was apparent that the men were not in sympathy with the safety policies of the company, and could not get into sympathy with them. A few of the discharges, however, were on account of deception, with respect to misstatements as to accidents. Nine collisions occurred one day, and this startling number was made the occasion for the first demonstration on a considerable scale that discipline was an essential feature of the new regime.

New Medium Between Company and Public in New York.—*Interborough Rapid Transit* is the name of a new bulletin just issued by the Interborough Rapid Transit Company, New York, N. Y. The new paper, which will be published from time to time, as constantly arising questions demand it, has long been contemplated as a medium of expression between the company and the public, while, on the other hand, the *Interborough Bulletin* and the *New York Railways Employees' Magazine* already serve as mediums of communication between the companies and their employees. The circulation of the new magazine will depend upon the subject matter handled, i. e., it will be mailed to those individuals and organizations who would seem at the time to be most interested in the subject under discussion. The front page of the first issue, dated Dec. 20, 1916, contains a graphic representation of the tremendous growth of the traveling habit in New York from 147 rides per annum per person in the horse car days of 1872, to 332 rides per person on the subway, surface and elevated lines in 1916. The paper also enumerates and describes the numerous and costly safety devices which have been installed in the subway, such as safety platforms, safety signal system, door signals, extra lighting system, electric fans and white enameled car ceilings for better lighting.

Personal Mention

Charles Ruff has been appointed master mechanic of the Lincoln (Neb.) Traction Company.

B. W. Hilliard has been appointed superintendent of transportation of the Lincoln (Neb.) Traction Company.

C. R. Phenicie, vice-president of the Wisconsin Public Service Company, Green Bay, Wis., has been elected vice-president of the Manitowoc & Northern Traction Company, Manitowoc, Wis.

Charles E. Miller, who has been bookkeeper for the Marion & Bluffton Traction Company, Bluffton, Ind., for several months, has been appointed auditor of the company. Mr. Miller entered upon his new duties on Jan. 1.

Lawrence I. Grinnell, who went to the Border in July, 1916, as a member of Troop D, Squadron A, New York National Guard, has been mustered out of active service and has resumed his position as a member of the editorial staff of the ELECTRIC RAILWAY JOURNAL.

J. G. Miller has been appointed local manager of the Manitowoc & Northern Traction Company, Manitowoc, Wis., to succeed Thomas Higgins, resigned. Mr. Miller was born and educated in Milwaukee, is a civil engineer by profession, and was formerly in electric railway work in San Antonio, Tex. Mr. Miller for the past year has been civil engineer for the Highway Commission in construction of roads about the city of Milwaukee. The property at Manitowoc was taken over recently by the Clement C. Smith interests.

Charles A. Drummond has been appointed assistant publicity agent of the Detroit (Mich.) United Railway and assistant editor of *Electric Railway Service*, which is published in the interest of the railway. Mr. Drummond was for many years on the editorial staff of the Detroit *Journal* and for the last year and a half was city editor of that paper. He succeeds with the Detroit United Railway A. H. Sarvis, who resigned in November to become a member of the executive staff of the Flint Varnish & Color Works.

Melodia Blackmarr Jones, widow of Capt. Joseph T. Jones, president of the Niagara Gorge Railway, Niagara Falls, N. Y., the Gulf & Ship Island Railroad, Gulfport, Miss., and the Gulfport & Mississippi Coast Traction Company, has been elected active president of the Gulf & Ship Island Railroad. It is reported Mrs. Jones will also have charge of the Gulf & Mississippi Coast Traction Company. No announcement is made as to who will assume the presidency of the Niagara Gorge Railway, of which Burt L. Jones is general manager.

T. Lee Miller, since last August assistant to the president of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has resigned to accept a position with a New York banking firm. Mr. Miller was graduated from Cornell University with the degree of mechanical engineer. Immediately after graduation he became connected with the firm of Marwick, Mitchell & Company, New York, efficiency and cost engineers. Upon leaving the last-named firm he entered the service of the Toledo Railways & Light Company, Toledo, Ohio, as assistant to F. R. Coates, president. He resigned from that company in 1915 to become New York manager of sales of the Sangamo Electric Company. It was from this company that Mr. Miller resigned to become connected with the Fort Wayne & Northern Indiana Traction Company.

Charles Currie, who retired as vice-president and general manager of the Northern Ohio Traction & Light Company, Akron, Ohio, on Dec. 31, was born in Toronto, Ont., on March 8, 1868. At the age of fourteen he entered the employ of the London (Ont.) Street Railway as an office boy. This was in the horse-car days, and, although Mr. Currie's activities were always in the office end of the business, he had an opportunity of coming in contact with very many operating and construction problems. He rose through the office ranks as clerk, cashier and auditor, after which he became secretary of the company. In 1896 he was called to Lima, Ohio, as general manager of the Lima Railway. Three years later he resigned from the company at Lima to become general superintendent of the Cleveland (Ohio) Electric Railway. In this position he handled successfully a very serious strike. Mr. Currie became general manager of the Detroit & Toledo Shore Line, operating between Detroit and Toledo, in 1901, with headquarters at Detroit. He was then asked by the Everett-Moore syndicate to take the position of vice-president and general manager of the Northern Ohio Traction & Light Company, which had been organized only a short time before to take over the Akron, Bedford & Cleveland interurban line, the Akron city lines and several suburban lines. This connection continued fifteen and one-half years and witnessed the development of the property to one of the most modern and complete utilities of its kind in the United States. During Mr. Currie's administration at Akron other lines were added to those originally owned by the company, including the Canton-Akron, Canton-Massillon and Canton-New Philadelphia interurban lines and the Canton and Massillon city lines, making a consolidated property of 264 miles of track. The power developments of the company alone in the last five years involved an investment of more than $3,000,000. The Northern Ohio Traction & Light Company was one of the first to place limited cars on interurban lines and to demonstrate the possibilities of this service. In 1913 Mr. Currie spent three months in Europe studying the electric railway developments on the continent and in the cities of England and Scotland. With this exception he was never away from his desk for any length of time in the more than fifteen years' service with the company. On the sale of the property recently to Hodenpyl, Hardy & Company and E. W. Clark & Company Mr. Currie declined a proposal that he remain in active charge, but agreed to continue with the company as a director.

Obituary

Frederick W. Whitridge, president of the Third Avenue Railway, New York, N. Y., died on Dec. 30 of pneumonia following an operation for appendicitis. Mr. Whitridge, who was responsible for lifting the Third Avenue system out of receivership into a paying system, and whose recent controversy with the labor unions during the car strike brought him into prominence, was born in New Bedford, Mass., on Aug. 8, 1852. He was graduated from Amherst College in 1874 and in 1877 received a master of arts degree from the same institution. Mr. Whitridge was admitted to the bar of New York in 1879; and after that time practised in New York, devoting part of his time to lecturing at Columbia University on administrative law and constitutional and political history. In 1906, on the occasion of the coronation of King Alfonso of Spain, Mr. Whitridge represented the United States as special ambassador. The work of rehabilitating the physical property of the Third Avenue Railroad, which Mr. Whitridge directed as receiver of the company until he became president in 1912, is well known through the articles which have appeared in the ELECTRIC RAILWAY JOURNAL from time to time. While Mr. Whitridge was receiver of the Third Avenue Railroad his frequent tilts with the Public Service Commission of the First District enlivened the proceedings before that commission and his correspondence with that body was voluminous. This correspondence Mr. Whitridge subsequently published at his own expense. Besides being an author of numerous pamphlets, Mr. Whitridge wrote several books on legal, historical and other subjects, including one on the present European war. He received a degree of LL.B. from Columbia University in 1878 and in 1909 Amherst College, his alma mater, conferred on him a degree of LL.D. Mr. Whitridge was a director of many corporations besides the Third Avenue and its subsidiary companies. His funeral was attended by some 300 employees of the Third Avenue Railway, and a number of men very prominent in public life were among those who acted as honorary pallbearers. A resolution of sympathy and regret at Mr. Whitridge's death was drawn up at a meeting of the board of directors of the Third Avenue Railway held on Jan. 3.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

FRANCHISES

Berwyn, Ill.—The Chicago & West Towns Railway has received a franchise from the City Council of Berwyn to construct three new crosstown car lines on Harlem, Ogden and Ridgeland Avenues.

Taylor Springs, Ill.—The Southern Illinois Light & Power Company has received a franchise from the City Council of Taylor Springs to construct a line to the American Zinc Company's smelter.

Columbus, Ohio.—The City Council of Columbus granted a new twenty-five-year franchise to the Columbus Depot Company on Dec. 26 to cross a number of streets and erect a depot and union terminal station. The company will have until 1919 to complete the work. Town, Front, Rich, Walnut and Wall Streets are to be crossed with tracks and switches.

Miami, Okla.—The Oklahoma & Northern Traction Company has received a franchise from the City Council of Miami to construct a line on Vine Street for passenger traffic and a line on Short Street for freight traffic. F. M. Overlees and Richard Flood, Bartlesville, are interested. [Dec. 23, '16.]

***Union, S. C.**—Application has been made to the City Council for a franchise to construct an electric railway in Union. E. F. Kelly, B. F. Kennedy and A. C. Kennedy, Union, are interested.

Salt Lake City, Utah.—The Emigration Canyon Railroad has asked the Council for a franchise to construct an extension to the mouth of Big Cottonwood Canyon and thence up the canyon.

***Hampton, Va.**—H. R. Booker, Nelson D. Groome and H. H. Holt have received a franchise from the City Council to construct a line from Mallory Avenue to the city limits of Hampton.

TRACK AND ROADWAY

Montgomery Light & Traction Company, Montgomery, Ala.—A report from the Montgomery Light & Traction Company states that it will construct an extension from Pickett Springs to Wetumpka, 9 miles, during 1917.

Fort Smith Light & Traction Company, Fort Smith, Ark.—During 1917 this company will construct 1 mile of new track.

Peninsular Railway, San Jose, Cal.—Work will be begun in February by the Peninsular Railway lowering the tracks on its Alameda branch. It is estimated that the cost will be about $100,000.

Connecticut Company, New Haven, Conn.—Work has been begun by this company laying tracks on the new Stratford Avenue bridge, at Bridgeport. A temporary track is being laid on the northerly side of the bridge, which will be replaced with permanent rails later when the bridge is in use. On the southerly side the company will lay permanent tracks, and while these are being laid the cars will use the temporary tracks.

Valdosta (Ga.) Street Railway.—A report from the Valdosta Street Railway states that the company expects to begin construction of 3 miles of track in February or March.

Caldwell (Idaho) Traction Company, Ltd.—This company reports that during 1917 it expects to electrify the line between Caldwell, Greenleaf and Wilder, 10.3 miles, leased from the Oregon Short Line and now operated with steam.

Pekin City Municipal Railway, Pekin, Ill.—A report from the Pekin City Municipal Railway states that it will construct 2 miles of new track during 1917.

Springfield (Ill.) Consolidated Railway.—A proposition for placing all overhead wires in underground conduits, to be owned by the city and to be leased to the public utility companies, has been submitted to the City Council by A. D. Mackie, general manager of the Springfield Consolidated Railway. The cost of the installation of conduit system is estimated at $390,000.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company will construct an extension during the coming spring to the plant of the Premier Motor Corporation near Brookside Park. The exact route has not been announced but will be submitted to the Board of Public Works in the near future.

Mason City & Clear Lake Railroad, Mason City, Iowa.—This company reports that it will construct 7 miles of new track during 1917.

Arkansas Valley Interurban Railway, Wichita, Kan.—This company has applied to the Public Utilities Commission of Kansas for authority to issue $2,000,000 additional in bonds and $900,000 additional in capital stock for the purpose of making extensions into other counties, including Sumner, Butler, Cowley, McPherson, Marion, Rice, Saline and Dickinson.

Brantford (Man.) Municipal Railway.—A report from the Brantford Municipal Railway states that an extension of about 2 miles may be built during 1917.

United Railways & Electric Company, Baltimore, Md.—The Public Service Commission of Maryland has passed an order authorizing the United Railways & Electric Company to construct a new car line out Liberty Heights Avenue to Berwyn Avenue, and has approved the company's plans for the new route. The new line will make connection with the Garrison Avenue line and another line to enable passengers to reach Howard Park and Gwynn Oak.

Boston (Mass.) Elevated Railway.—This company will construct new rails in Salem Street from the Faulkner school to Broadway.

Lawrence, Mass.—A contract has been awarded by the Lawrence Bridge Commission to Joseph Wagenbach & Son, Lawrence, at $19,987, for the construction of 1500 lineal feet of double track on the Central Bridge across the Merrimac River in Lawrence. [Dec. 16, '16.]

Milford, Attleboro & Woonsocket Street Railway, Milford, Mass.—A contract has been awarded by the Milford, Attleboro & Woonsocket Street Railway to F. T. Ley & Company, Springfield, for the construction of a new bridge at Franklin at a cost of about $5,000.

Berkshire Street Railway, Pittsfield, Mass.—The Public Service Commission of Massachusetts issued an order Dec. 30, 1916, requiring the Berkshire Street Railway to complete its Lee-Huntington line for service on or before July 1, 1917.

Springfield (Mass.) Street Railway.—The lines of the Springfield Street Railway west of the Connecticut River are being equipped with the sectional three-wire system in an attempt to mitigate electrolysis.

Worcester (Mass.) Street Railway.—This company has received permission from the Board of Aldermen to construct an extension in Greenwood Street, Worcester, to the Millbury line.

Omaha, Lincoln & Beatrice Railway, Lincoln, Neb.—It is reported that the Omaha, Lincoln & Beatrice Railway will let contract early in the spring of 1917 for the construction of an extension from Lincoln to Omaha, via Havelock, Greenwood, Ashland, Papillion and South Omaha, about 50 miles, including the construction of pile and steel concrete bridges.

Fallon (Nev.) Electric Railroad.—This company, which is building a line from Fallon to Sand Springs, 38 miles, states that during 1917 it expects to build a line from Fallon to Stillwater, 4 miles. [Nov. 25, '16.]

Brooklyn (N. Y.) Rapid Transit Company.—Work will be begun during March by the Brooklyn Rapid Transit Company on the construction of an extension of the Metropolitan Avenue line. The line will extend from St. John's Cemetery, in Middle Village, through the Forest Hills section and thence to Jamaica Avenue, Richmond Hill.

International Railway, Buffalo, N. Y.—This company has completed its new double-track line on Bailey Avenue, between East Ferry and Genesee Streets and Broadway and William Street. One track has been laid between William and Clinton Streets and cars are now being operated over this new route, a distance of more than two miles. Tracks have been laid between Clinton and Seneca Streets and service over the line between Broadway and Seneca Street will be started within the next few weeks.

Elmira Water, Light & Railroad Company, Elmira, N. Y.—This company plans to lay a double track along College Avenue, from Roe Avenue north to West Thurston Street, at which point a new single-track line is to be laid along Thurston Street to Westside Avenue, where it will be united with the present tracks.

New York State Railways, Utica, N. Y.—The president, trustees and citizens of Whitesboro have filed a petition with the Public Service Commission of New York asking that the New York State Railway be required to reconstruct its tracks through the village, the present track construction being too light and inadequate.

Northern Ohio Traction & Light Company, Akron, Ohio.—The Public Utilities Commission has authorized the Northern Ohio Traction & Light Company to issue $1,000,000 additional stock, from the proceeds of which a number of improvements will be made.

Cleveland (Ohio) Railway.—This company plans to construct tracks on the new Detroit-Superior high-level bridge at a cost of about $135,000.

Columbus Railway, Power & Light Company, Columbus, Ohio.—This company has proposed to build a line on Eleventh Avenue from Fourth Street into and past the State Fair Grounds to connect with its Linden line, if the city will accept $5,000 as its proportion of the cost of eliminating the Big Four Railroad grade crossing. The Council asked the company to pay $20,000. The Chamber of Commerce recently passed a resolution requesting the Council to accept the company's offer.

***Middlefield & Lockwood Traction Company, Middlefield, Ohio.**—The Public Utilities Commission of Ohio has authorized this company to issue $100,000 of common stock and $200,000 of bonds for the purpose of constructing a line between Middlefield and Lockwood, 12 miles, which will be operated by the Eastern Ohio Traction Company. This will connect Cleveland and the Youngstown district.

Sand Springs Railway, Tulsa, Okla.—It is reported that the Sand Springs Railway has awarded a contract for the double-tracking of its line from Sand Springs to Tulsa.

Tulsa (Okla.) Street Railway.—This company was stopped by an injunction issued by the District Court at Tulsa when it attempted to lay its tracks across the new $200,000 bridge built by Tulsa County, across the Arkansas River at Tulsa. The traction company had laid 500 ft. of track on the approaches to the bridge when the injunction was granted. Tulsa County Commissioners have laid down certain rules and conditions that must be met by any traction company which desires to use the new bridge. The public authorities contended that the company was not meeting these requirements.

Tulsa (Okla.) Traction Company.—It is reported that construction has been begun by this company on its proposed extension to Sapulpa. All material for the new line has been purchased and contracts that have been let call for a completed road that will permit the operation of trains from Tulsa to Red Fork.

Montoursville (Pa.) Passenger Railway.—This company reports that in the spring it will construct 1½ miles of new track in Loyalsock Township and in Montoursville.

Philadelphia, Pa.—According to an unofficial announcement, the public hearing before the Public Service Commission of Pennsylvania on the application of Director Twining for a certificate of convenience for the Byberry trolley line will be held in Philadelphia during the week of Jan. 8. The Byberry line, for which $1,200,000 has been appropriated, is designed to extend from Frankford and Oxford Avenues, along Oxford Avenue, Castor Road, Bustleton Avenue, Worthington Road and Southampton Road to Byberry and Beusalem Pike, in the Thirty-fifth Ward.

Dallas (Tex.) Consolidated Street Railway.—This company has announced its readiness to begin improvements on Tremont Street from Beacon Street to Fulton Street, as ordered by the City Commissioners of Dallas. The company will relay its tracks with 90-lb. T-rails, the work to be completed early in February.

Grays Harbor Railway & Light Company, Aberdeen, Wash.—Petitions asking the construction of a line between Grays Harbor and Willapa Harbor will be presented to the officials of Grays Harbor Railway & Light Company at an early date by the Grays Harbor Realty Association.

***Tacoma, Wash.**—President D. D. MacKay of Whitworth College, Tacoma, backed by business men of Spokane, is heading a committee which will petition Louis W. Hill, president of the Great Northern Railway, to construct a street railway line from Whitworth College to Spokane, to supplant the present jitney service. President MacKay states the college has an offer from one railroad company that if the college will obtain the roadbed and lay the rails, the company will take care of the operation of the line. The estimated cost of constructing the line has been placed at $20,000.

Wisconsin Railway, Light & Power Company, La Crosse, Wis.—This company reports that during 1917 it expects to double-track and reconstruct some of its lines.

SHOPS AND BUILDINGS

Pacific Electric Company, Los Angeles, Cal.—Work has been begun on the construction of new carshops for the Pacific Electric Railway at Torrance. Fourteen buildings will be constructed at this time, these constituting the first and principal unit of a group that will eventually include thirty or more structures. As soon as the need for expansion arises, a second unit comprising six structures will be erected adjoining the first group. The new buildings, equipped, will cost over $500,000, and all plans are made so that the plant can be doubled at any time without any impairment of efficiency while the construction work is going on. Recreation grounds, including a baseball field and tennis courts, will be provided for the employees, and the entire surroundings made as agreeable as possible.

Connecticut Company, New Haven, Conn.—This company will reconstruct and extend its carhouse at Waterbury, for which an authorization of $200,000 has been granted.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has received bids for the construction of station finish for nine stations on the lower portion of the Seventh Avenue subway in Manhattan. The contract has already been awarded by the Commission covering several stations on the northern portion of this line. The stations included in the bids recently received were those between South Ferry and Fourteenth Street inclusive, including two express stations. The low bidder was the Seventh Avenue Construction Company, New York, at $389,880. Bids had been received for the construction of station finish for the above stations previously. The bids were rejected, however, when question arose as to the incorporation of one of the bidders.

Piedmont & Northern Railway, Charlotte, N. C.—It is reported that plans have been prepared by the Piedmont & Northern Railway for the construction of twelve warehouses to cost about $100,000.

POWER HOUSES AND SUBSTATIONS

Indiana Railways & Light Company, Kokomo, Ind.—This company has announced that it will enlarge its power house at Kokomo, and plans to install four new boilers of 500-hp. capacity at an estimated cost of $48,000; a 5000-kw. turbine and necessary auxiliaries at an estimated cost of $90,000 and additional pumps, heaters and other devices necessary to complete the enlargement of the plant at a cost of $10,000. The installation of 250 new street lamps at an estimated cost of $10,000 to $12,000 is also planned.

Burlington Railway & Light Company, Burlington, Iowa.—This company has received permission from the Iowa Railroad Commission to extend its transmission lines in Louisa and Des Moines Counties.

Manufactures and Markets

Discussions of Industrial Conditions
A Department for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Business Announcements Trade Literature

Steel Tie and Crossing Foundation Business Is Active

Inquiries Very Numerous from All Parts of Country—Price Increase Probable—High Prices of Manganese Crossings Stimulate Crossing Foundation Inquiries

Inquiries for steel ties and for crossing foundations were never before so numerous," according to E. M. Haas, sales manager of the International Steel Tie Company. "These inquiries," he states, "originate with both electric and steam railways. They are not confined to any part of the country nor to large or small roads but are diversified as to location and size of property. One reason for the inquiries is the anticipation of an increased price in the spring and because a great many roads were sufficiently fore-handed to order rails far in advance for the 1917 construction season."

STEEL TIES SOLD AT LESS THAN MATERIAL PRICE

According to Mr. Haas the possible increase in the price of the International twin-steel track ties is due entirely to the raw material market situation. The International company now has more than $100,000 worth of raw material in its yards, but a large part of this will be required in fulfilling tie contracts now in hand. This reserve supply of steel was purchased some time ago at 2½ cents per pound. The market is now at 4½ cents per pound, and deliveries are difficult. According to the manufacturer, twin-steel ties are now being quoted at a price below that of the present cost of the raw material, and therefore it appears that when additional material is necessary, the manufacturer will be forced to increase the selling price of the ties. "At present prices," Mr. Haas says, "the use of steel twin-ties, compared with wooden ties, will show a construction-cost saving ranging from $2,000 to $6,000 per mile. This proportionately large saving is derived from savings in excavation and in concrete, as well as in the cost of ties. Thus, any slight increase in the first cost of the steel tie will not greatly affect the initial and final economy.

CROSSING FOUNDATION BUSINESS DEVELOPING FAST

"The unusually high range of prices for special track work and particularly crossings in which manganese steel is used has brought about more active recognition of the value of stable crossing foundations. This condition has accelerated the sale of the International crossing structures. The roads have found, for example, that by combining an ordinary built-up crossing with the International steel crossing foundation, the life and cost of the unit, installed in situations where the life of the crossing is limited by the bolt breakage, compares favorably with that of the installation of a manganese steel crossing. The reason for the economy is the large bearing area of the International foundation. This, in combination with a built-up crossing, affords a bearing area much larger than that of a widely spread manganese steel crossing. Moreover, bolt breakages are practically eliminated by the unit support given to the composite crossing frogs."

Favorable service reports on six International crossing foundations installed by the Los Angeles Railway, where it crosses the Santa Fé Railroad tracks, have resulted in orders for the construction of other foundations which will be used by the Santa Fé for steam-over-steam crossings. It is pointed out by Mr. Haas that in this way the Santa Fé System will be able to watch the crossing foundation performance and have entire say about its maintenance. They will thus be able to determine the actual cost. The Pennsylvania Railroad also has installed six of these foundations in Indiana and Ohio. Some of these have been down three years, and the results are so favorable that the engineering department of the road is said to have appointed a committee of division engineers to keep track of the performance of these crossings and to report for the benefit of the entire Pennsylvania System.

Adaptation of Compressed Air to Door and Step Control

T. W. Casey Discusses in Detail the Advances Made in the Various Branches of This Highly Specialized Art

In a recent interview, T. W. Casey, vice-president of the National Pneumatic Company, discussed the remarkable development during recent years of pneumatic door and step control for electric railway cars.

When the company brought out its first pneumatic engines for operating car doors, in 1905, it was already doing a large business in air operators for elevator doors. The air-operated car door was considered applicable only to heavy rapid-transit service like the New York subway, where it was obviously impracticable to operate center doors rapidly by hand when the guard was stationed on the end platform. These engines lacked a number of the features that are in use to-day, such as the cushioning feature, the releasing feature which prevents passengers from being caught in the doors, means by which doors may be opened at one rate of speed and closed at another; means by which only a practically negligible amount of air is used—as well as numerous detail improvements, such as continuous lubrication regardless of weather conditions, etc.

The use of air-operated doors in heavy rapid-transit service showed such a clear gain in reducing the standing time of the cars at station stops that progressive operators began to see its advantages for operation on surface cars. This was particularly true of applications to lines with congested traffic and short headways, where the burdens imposed upon the motorman and conductor are so great that any automatic device that enables them to handle passengers faster and more safely is worth consideration.

It would seem a very simple problem to work out air-operated doors, and steps interconnected therewith, for practically universal application. Nevertheless, almost every city has a combination of needs that calls for important variations whose successful invention and application demands the services of men who are specialists in pneumatic devices. As examples of diverse conditions one may name the Bay State Street Railway, where both left-hand and right-hand operation are required; the New York Municipal Railway, where it is necessary to operate from one to six doors; the Pontiac Interurban Division of the Detroit United Railway, where the doors must be capable of being operated from any part of the car; and the Detroit city lines, where the air consumption of the engines must be so low that it will not interfere with the storage-air-brake operation unique to Detroit.

The National Pneumatic Company's engineers have been obliged to develop not only the design but in many cases the tools for securing that exactitude of manufacture that is essential to a pneumatic device called upon to operate hundreds of times a day under very severe conditions.

It is now recognized that air-operated doors and steps not only fulfill the function of greater safety but they make possible higher schedule speeds, permit the conductors to collect fares under easier conditions, allow the mechanism to be operated with scientific uniformity and ease, and, in general, enable the car to produce more revenue car-miles a day than had been hitherto possible.

Among the cities where this company's air-operated door and step control is used may be named New York, Brooklyn, Boston, Cleveland, Detroit, Schenectady, Utica, Syracuse, Ottumwa, Indianapolis, Haverhill, Toledo, Denver and Pasadena. These installations cover practically the whole range of electric railway service. Judging from the large number of equipments ordered during 1916, Mr. Casey feels that the time is not far distant when practically all new cars and a very large proportion of existing cars will be fitted with pneumatic door and step control.

Copper Value Contends with Iron for First Place

A total of over $100,000,000 in dividends was paid out of the mines of five Western States in the year 1916, according to a recent report of the Geological Survey to Secretary Lane, just made. "Never before," said Mr. Lane, "has so large a draft been made on the natural resources of our country as during this year, and never before have the metals been extracted from these ores with less waste or utilized to better advantage in advancing the general prosperity of the country. Even as written in the plain figures of 1916 production, the wonderful record of our mines sets forth a degree of national industrial independence only hoped for a few years ago.

"Again copper stands out as the best illustration of how American mines can meet a world demand. The output of nearly 2,000,000,000 lb. of the red metal is double that of ten years ago, and its value is twice that of the copper produced in 1915. Add to this the facts that in value copper now contends with iron for first place among the metals, and that together the amount of these two metals produced last year had a value of more than $1,000,000,000, and we have a measure of what this country can contribute in useful metals.

"The output of zinc for domestic ores increased last year 95,000 tons, which makes a new record for that metal, the total value of spelter from United States ore being $150,000,000. Lead also shows a large increase, the $75,000,000 output being a gain of more than 50 per cent.

"Another mineral product which furnishes an index of business conditions is cement, the 1916 production of which is estimated to be 5,000,000 bbl. in excess of the output of the previous year, while the shipments were even greater, aggregating 94,500,000 bbl.

"These advance statements not only show that 1916 marks a new advance for the mineral industry of the country, but this remarkable increase promises to be approximately 25 per cent over the 1915 production."

Rubber Covered Wire Market a Puzzle

Market Hard to Analyze—Manufacturers Crowded with Orders—No Fixed Price for Bare Wire —No Hope for Lower Prices

The market situation for rubber covered wires and cables is most difficult to analyze so far as the future is concerned, and according to manufacturers it would be unwise to hazard a guess as to how long the present condition will continue. The operation of the law of supply and demand under the present situation is influenced by many uncertain factors, and also it is generally admitted that the output of copper for the first half of 1917 is practically all under contract. Even if orders for war munitions were curtailed, that could not affect the wire and cable industry for months to come. Manufacturers' books are crowded with orders for deliveries which will run well into 1917, and these orders were taken and the copper contracted for at prevailing prices.

There is no fixed price for bare copper wire. It is altogether a matter of bargaining between buyer and seller, and the price is largely determined by the necessities of the buyer. Bare copper wire in substantial quantities for immediate delivery, or even for delivery in the near future, is not to be had. That manufacturers are paying premiums to expedite deliveries and are placing orders for shipments five and six months hence is also true, as well as that purchasers who have in the past followed the policy of holding up requisitions in the hope of lower prices now find themselves obliged to cover their needs in a much higher market. "The Wire Message," published by Habirshaw Electric Cable Company, Inc., and the Electric Cable Company, commenting on the foregoing situation, says that it "can see nothing in the copper situation to justify the hope of lower prices in the near future. On the contrary there are many indications that point to higher values."

Electrical Production for 1916 Passes Half-Billion Mark

At no time in the history of the world has industry been carried on so tremendously as during the twelve months of the year that has just passed. The new year is ushered in to the music of a record of production difficult not only to surpass but even to equal. In this flood of business prosperity the electrical industry was swept along with the leaders. Electrical manufacturers and agents have produced and sold to the last ounce that was physically possible, and yet the market is unsatisfied. The production of electrical goods in 1916 went beyond the $500,000,000 mark, while the unfilled orders at the beginning of 1917 were probably well over $200,000,000. There was placed, therefore, in 1916 a volume of orders for electrical equipment of $750,000,000, a most stupendous total for an industry that has practically grown up within the present generation.

With one or two exceptions the orders placed in 1916 were not particularly large. In the first few days of 1916 a $1,000,000 order was placed for the electrical equipment of a steel mill, and in the last few weeks of the year a prominent holding company placed a $1,000,000 contract for electrical equipment for its various plants. As a rule, however, the orders were not of a size to create comment.

On the other hand, there was a marked tendency toward the purchase of units larger than ordinary rating. Orders were received for a number of 15,000-hp., 12,000-hp. and 8000-hp. motors. The 15,000-hp. size is the largest ever built. Turbo generator sets passed the 60,000 hp. mark early in the year, when a 73,000-hp. set was ordered for one of the largest urban railways in the country. There have been other orders for sets in the neighborhood of 50,000 hp., which rating was unattained until a few months previous to the placing of the order for the 73,000 hp. set.

ROLLING STOCK

Toronto (Ontario) Railway, Toronto, Canada, is reported on Dec. 28 to have lost 130 cars in a fire which totally destroyed its carhouse.

International Railway, Buffalo, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of Dec. 16, 1916, as having ordered twenty double-end center-entrance cars from the G. C. Kuhlman Car Company has specified the following details for this equipment:

Seating capacity	63
Weight (car body only)	27,000 lb.
Bolster centers, length	32 ft. 0 in.
Length of body	43 ft. 10 in.
Over vestibules	53 ft. 7¼ in.
Width over sills—	
Over all	8 ft. 8¼ in.
Height, rail to sills	2 ft. 10⅞ in.
Sill to trolley base	9 ft. 3 in.
Body, wood or metal	Semi-steel
Interior trim	Mahogany
Headlining	Nevasplit
Roof, type	Arched
Underframe	Metal
Air brakes	Westinghouse AMM.
Axles	5 in. and 6 in. EB.
Bumpers	Hedley Anti-climbers
Cables	Flexible
Car trimmings	Chocolate brass
Conduits and junction boxes	Crouse-Hinds
Control, type	GE, PC.
Couplers	Tomlinson
Curtain fixtures	Curtain Supply-Rex
Window fixtures	Ring 1 in. roller
Curtain material	Pantasote
Door operating mechanism	Consolidated
Destination signs	Hunter
Fenders or wheelguards	Locomotive Patented
Gears and pinions	GE Grade M
Gongs	12 in. Dedenda
Hand brakes	National
Heaters	Consolidated
Headlights	GE Luminous
Journal boxes	4¼ in. x 8 in. MCB
Motors, types and number	4 GE 203
Motors, suspension	Inside
Paint	Acme System
Registers	New Haven Square
Sanders	Westinghouse
Sash fixtures	Brill
Seats, style	Transversible head roll
Seating material	Fabrikoid
Springs	Brill
Step treads	Feralun Safety
Trolley catchers or retrievers	Earll No. 10
Trolley base	US 14
Trucks, type	Brill MCB-2
Varnish	Valspar
Ventilators	Brill Exhaust
Wheels	30 in. rolled steel, 3 in. tread ¾ in. flanges

Toronto (Ont.) Railway, Toronto, Canada, lost 130 cars in a disastrous fire which totally destroyed the King Street carhouse on the Don River and caused a loss of about $500,000. Of the equipment destroyed, one-third consisted of palace cars, the remainder being cars of other types. The King Street division will be operated temporarily from the Front Street carhouse and cars from the different divisions will be drawn to provide an adequate service. It is reported that the loss will be fully covered by insurance.

East St. Louis & Suburban Railway, East St. Louis, Ill., and not the Columbus (Ohio) Railway, Power & Light Company, as was noted in the ELECTRIC RAILWAY JOURNAL of Dec. 23, is said to be in the market for five city cars and three interurban cars. It was stated that this company was planning to rebuild forty-five cars in its own shops, but these plans have been changed. The company now plans to have new car bodies built by the American Car Company, making use of the hardware and equipment from the old cars as far as possible.

TRADE NOTES

Trolley Supply Company, Canton, Ohio, has received an order from the Boston Elevated Railway for 200 Simplex trolley bases for its 100 new cars.

Joseph A. Bower, Philadelphia, Pa., president of the Hale & Kilburn Company, has been elected a vice-president of the Liberty National Bank, New York City.

Robbins & Myers Company, Springfield, Ohio, announces that on Jan. 1, 1917, the Rochester office will be removed to 740 Ellicott Square Building, Buffalo, N. Y. L. Larsen, the present manager of the Rochester office, will have charge of the Buffalo office.

Stanley M. Tracy, until recently Western district manager in the Chicago office of the Driver Harris Wire Company, is now assistant general sales manager at the main office and works of the company, Harrison, N. J.

F. H. Poss became sales manager of the Benjamin Electric Manufacturing Company on Jan. 1. He was formerly Pacific Coast manager for the same company, having opened that office in 1905. Between 1905 and 1912 he also represented the Holophane Company.

American Conduit Manufacturing Company, Pittsburgh, Pa., announces that beginning Jan. 1, M. B. Austin & Co. of 700 Jackson Boulevard, Chicago, Ill., will be its sales agents in Chicago territory for the following products of its manufacture: "Wiremold," the new surface wiring material, and "Wireduct," a non-metallic flexible conduit.

Hensley Trolley & Manufacturing Company, Detroit, Mich., will be represented after Jan. 1 in the New England States by the Frank Ridlon Company, 261 Franklin Street, Boston, Mass. The company feels that its many customers in the New England States will be better taken care of by having a representative in this territory and for this reason they have appointed the above company as exclusive agents.

F. R. Blair & Company, Inc., 50 Church Street, New York, N. Y., announce that on Jan. 1, 1917, H. H. Gildner, who has been chief engineer for the S. K. F. Ball Bearing Company for the last three years, has joined this organization as manager of the Flexite department. Mr. Gildner will make his headquarters in New York and will devote his time to the development and sale of Flexite universal joints and couplings.

Lord Manufacturing Company, New York, N. Y., wishes to correct the announcement made in the ELECTRIC RAILWAY JOURNAL of Dec. 30, and advises that the entire business, together with all of the railway devices now manufactured by it, will be taken over and handled after Jan. 1, 1917, by the Horne Manufacturing Company, 50 Court Street, Brooklyn, N. Y. Under the new arrangement manufacturing facilities will be increased and the scope of the selling organization enlarged.

Lumber Prices Show Little Increase.—A recent compilation by the best authorities of the prices of 111 commodities on the New York market compared with only two years ago shows a minimum increase of 19 per cent, a maximum of 476 per cent and an average of 85 per cent, yet the official Government figures show that the lumber manufacturer in 1915 got 10 per cent less per thousand feet for his product than in 1906. According to R. S. Kellogg, secretary National Lumber Manufacturers Association, the 1916 lumber prices will average little more than those of 1915.

ADVERTISING LITERATURE

General Electric Company, Schenectady, N. Y., has issued bulletin No. 49,300 on single, flat twin and three conductor band-steel armored cables. A number of completed installations are shown and several pages are devoted to data on the different types and grades of armored cable.

Peter Smith Heater Company, Detroit, Mich., has sent out a danger notice in the form of a post card. This card is a warning to operators of hot-water heaters, advising them to test safety valves and to know that the system is open and free to circulate before placing heaters in service.

United Hammer Company, Boston, Mass., is distributing a sixteen-page booklet on Fairbanks' hammers. The regular hammers which are manufactured in sizes of from 25 lb. to 300 lb. are described and illustrated, as are also motor-driven hammers with special treadle and hammers with self-contained countershafts.

Atlas Preservative Company of America, Inc., 95 Liberty Street, New York, N. Y., announces that the company has been reorganized and after Jan. 1, 1917, will be known as the Chipman Chemical Engineering Company, Inc. The company as reorganized will continue the weed-killing business by the Atlas "A" method, and the manufacture and sale of chemicals used in this process will be continued as in the past. Improved manufacturing facilities and additional capital will enable the company to give its customers the highest class service. The staff of the new company, of which R. W. Chipman is manager, will remain the same.

Harvey Fisk & Sons, New York, N. Y., bankers and government bond dealers, have published a 120 page pamphlet, "The Insular Possessions of the United States—The Republic of Cuba," descriptive of the island possessions of the United States, Hawaii, the Philippine Islands and Porto Rico, and of the Republic of Cuba. The book contains chapters on the area and population, products and industries, banks, commerce, finances and bonded debts, also historical notes. The book will be found valuable for reference not only by investors, but also by all persons who wish to be well informed about these island countries.

Railway Utility Company, Chicago, Ill., has issued catalog No. 600 on car ventilation and on the thermometer control of electrically heated cars. The operation of the thermometer control is explained, and wiring diagrams and illustrations of the regulator panel are also given. One section is devoted to Honeycomb and round-jet ventilators which are designed for all classes of cars and buildings. Sections through the different types of Honeycomb ventilators are shown and in addition a summary of tests showing efficiencies are tabulated. The last ten pages show illustrations of these ventilators installed on electric car equipment.

NEW PUBLICATIONS

Applied Electricity for Practical Men. Arthur J. Rowland, McGraw-Hill Book Company. 375 pages, illustrated. Price $2.

The many books written for the purpose of imparting electrical knowledge without demanding of the reader a considerable acquaintance with mathematics generally have one of two faults. They either attempt to cover the whole range of electricity or they deal too much with principles without giving sufficient knowledge of practical applications. This volume seems well adapted for practical men who expect to make direct application of their information to their daily work with commercial circuits and machinery. It does not touch problems of apparatus design. Pure theory is avoided except as it bears directly on practical matters. The principle stated and the explanations of apparatus offered are given to show the practical application of the theory. Numerical problems are given at the end of each chapter, and these are useful both in teaching the principle and performances of apparatus and also as guides in solving particular problems that may come up in practice. The book should prove very useful for teaching applied electricity in trade and industrial schools, and for helping electrical workers of all kinds.

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AUTOMATIC SUBSTATIONS IN DES MOINES

We are pleased to be able to give our readers this week some data regarding the equipment of automatic substations now in process of installation in Des Moines, Iowa, on the city and interurban lines. The most striking fact in this case is that a large quantity of low-tension line copper is to be taken down and sold, a highly profitable undertaking with scrap copper at its present price. The significance of the Des Moines situation is that the engineers of the local railways had sufficient confidence in the reliability of this newcomer in the transportation field to proceed upon the basis of calculations to adopt it upon so large a scale. In this case, also, one element favoring the "automatic" was lacking, namely the possibility of making considerable immediate saving in labor cost. It had to justify its adoption upon the basis of low investment cost. Ultimately there will be a labor cost saving also but this will be "velvet" so to speak. In this installation the automatic principle will be applied in two ways. It will be used for the substations considered as units and also for the individual machines. In the first case the substations will come onto the line or go off as may be necessary to maintain proper voltage regulation, and in the second case where more than one rotary is installed the machine capacity will be adjusted to the load requirements so as to maintain high efficiency and prevent overloading. The flexibility of the automatics is indicated here as they are used in conjunction with the manually-operated substations, each type being assigned to the duty which it can best perform.

AUTOMATIC SUBSTATIONS IN GENERAL

It is but about a year and a quarter since we published the first account of an automatic substation equipment in the transportation field, that is on the Elgin & Belvidere Electric Railway, a small property in northeastern Illinois. This installation has since operated with entire satisfaction to the owners. Since then substantial progress has been made, and one manufacturer reports that at the end of 1916 there were twenty automatic electric railway substations under construction or in operation, the latter comprising about one-half of the total. This progress is quoted principally as evidence of the confidence felt in the reliability of the apparatus. The advantages of a scheme like this can be worked out nicely on paper, but after all they are only of academic interest if the element of reliability is lacking. The underlying principle involved here is that of utilizing the high-tension line to the fullest possible extent. With any system on which rotary converters are used it is obvious that the more uniformly these converters are spread over the system the less will be the amount of copper required in the low-tension distribution. However, with manually operated stations, the labor item soon sets a subdivision limit. With the automatics many more substations can be used, for the labor element is inconsiderable, but ultimately a limit is set by the increasingly higher cost per kilowatt of substation equipment, including buildings and sites, as the individual capacities of substations are lower. An economic balance must be struck to determine the proper number of units to be used in any case.

THE TRACTIVE RESISTANCE OF CARS ON CURVES

Last week we directed attention to the recently published description of tests, made under the auspices of the University of Illinois Engineering Experiment Station, on the tractive resistance of a double-truck electric car on curves. The results of the tests furnish data to show that there is a relation between speed and resistance, a fact which while suspected has in general been ignored for lack of definite information. Under these circumstances it has been customary to assume a value for the extra resistance due to track curvature on the basis of weight, degree of curvature and, sometimes, length of wheelbase. For rough calculations one extra pound per ton per degree curvature is a convenient factor, although this value is probably high for the usual conditions under which an electric car rounds curves. It appears from the University of Illinois tests, however, that unless the merest approximation to the force or the power required in rounding curves is desired such an assumption is entirely too crude. For example, from the sample chart printed last week the tractive resistance per ton at 35 m.p.h. on a 5-deg. curve is 10 lb., whereas at 1 lb. per degree curvature it would be 5 lb., or one-half as much. At 10 m.p.h. on an 8½-deg. curve the force is 5 lb., or, say, 30 per cent less than under the 1-lb.-per-ton-per-degree assumption. It may also be of interest to compare the power consumptions in the above cases. At 35 m.p.h. on the 5-deg. curve slightly over 0.9 hp. per ton is required to overcome curve resistance only, while at 10 m.p.h. on the 8½-deg. curve it is 0.133 hp. At 1-lb.-per-ton-per-degree the respective values would be 0.46 hp. and 0.226 hp. It must, of course, be remembered that the University of Illinois tests were made on one car and under somewhat limited track conditions. However, they furnish reference data of value. The components of curve resistance are of a nature to resist rational investigation. We must, therefore, largely depend upon empirical formulas like the one resulting from these tests.

A PRAISEWORTHY VALUATION REPORT

With the science of valuation still in a formative stage, as it is, we are glad to see any work that really tends to clarify the subject. We welcome, therefore, the long-awaited report of the valuation committee of the American Society of Civil Engineers, abstracted elsewhere this week, for it summarizes in a way that should be helpful to utilities the principles that should control the valuation of normal properties. Representing five years of steadfast work, in the course of which the first progress report was almost completely revamped, the present work ought to be of material service in reducing the uncertainties of valuation as now practiced, although in such a rapidly growing science it is necessarily not the last word.

What to our mind is the most admirable feature of the report is its comprehensiveness and fair discrimination. For instance, although it realizes the desirability of a goal of uniformity, it clearly sees that a sharp distinction must be made between what may be done under present laws and what may be done under future legislation and continuous commission control. New properties, old properties under regulation from their inception and old properties not subject to continuous regulation present different problems and demand different treatment along depreciation and other lines. In general, the report testifies to the painstaking efforts of the committee not to sacrifice justice to generalization, and it deserves careful study as an example of sanity in valuation literature.

The report is too voluminous to be discussed here in detail, but some of the noteworthy sections may be mentioned. The committee, for instance, recognizes that the bases for ratemaking, capitalization, taxation and public purchase are not necessarily the same, but that in each case "fair value" should be deduced by making full allowance for the tangible values in the property, however acquired, and also full allowance for intangibles as far as they are applicable to the purpose in mind. In other words, in an appraisal on the original cost or reproduction-cost basis there must first be included the tangible elements with assigned costs based on concrete facts, but the pertinent facts relating to intangible elements should then be developed independently, so that their value may be determined and added to the appraisal.

In regard to the two main indicators of tangible value, original cost and reproduction cost of existing property, it is evident that the committee is inclined to favor the latter, because of the practicable impossibility of obtaining a dependable result where the absence of reliable historical data makes necessary a resort to estimates of original cost, as in the case of old properties consisting mainly of long-lived items. We recognize, of course, the difficulty of obtaining an original cost figure when records are poor or unavailable, and to such an extent we agree with the committee. We believe, however, that original cost should be ascertained if possible as one of the elements of "fair value," and we are not at all certain that the resourceful engineer cannot, in the absence of only part of the original cost records, make suitable estimates with as great a degree of dependability as he can establish a proper reproduction cost schedule of the existing property for the application of present prices.

Other important points in the report have to do with land valuation, development expense and going value. Utilities that have seemed to try in various guises to secure what the Minnesota rate decision denied—an additional land value attaching to the property because of its higher use—will probably be disappointed in the finding of the committee on this point, but they should notice that the report is far from going to the extreme desired by some commissions, *i.e.*, striking off all elements except the naked formal value of land. In other words, the committee believes in the full allowance of all real items of cost, including the compulsory feature, severance damages and acquisition expenses. In regard to development expenses, the committee, in classifying these as an unavoidable real cost to be added to the cost of the physical property, has recognized the demand of commissions that such expenses be proved by the presentation of concrete facts, while in making going value a distinct and intangible element the committee has taken a step that should clarify the existing confusion and secure for this item its proper recognition with other elements that are included in the intangible group.

We have mentioned before the realization of the committee that different utilities must be treated differently in valuation matters. The report particularly emphasizes this in depreciation matters. Its analysis is very clear. What it happily calls "decretion" or loss of service life is always present in some degree even in a well-maintained property. Whether the cost of decretion, however, is a deductible quantity or "depreciation of valuation" simply depends on the accounting procedure that has been followed, or should have been followed under regulation. If the heretofore much-criticized replacement method is used, as on railways where renewals are handled as ordinary maintenance and retirements after a time proceed with fair regularity and cause no serious variations in the return, the cost of decretion found to exist at any time should not be deducted from the valuation because the public has not yet paid for the accrued decretion and is still under obligation to pay for it. Where a commission, however, has prescribed an accumulating depreciation fund in order to make provision in advance for the full decretion of property items, the cost of decretion should be deducted in securing the rate base, but this deduction should be offset by the fund found in public service, either as a separate fund or as additions to plant. Complications arise, for instance, when the accounting treatment of depreciation has not been uniform or when regulation has limited earnings so that they have not been sufficient to cover operating expenses, depreciation allowances and a fair return. In the former case the committee positively says that the depreciation of valuation should be equivalent merely to the accumulated contributions of the public for depreciation allowances. In the latter case the committee qualifies its suggestion of the same procedure by saying that the relative importance of depreciation and a fair return is a matter of equity which will have to be decided by the court. This is undoubtedly correct, but when the courts act we hope that utility owners will not be penalized because of the failure of commissions to allow adequate earnings.

PURCHASE AND SALE OF ELECTRICAL ENERGY BY ELECTRIC RAILWAYS

There are few electric railways which are not interested in electrical energy as a commodity to be bought or sold, or both. In many localities energy can be purchased more cheaply than it can be generated, in others it is economical not only to generate electrical energy but to sell it also, at wholesale or retail. The businesses of transportation and electricity supply are constantly becoming more intimately related so that there are many properties which supply both kinds of service. In other cases, railway and lighting properties are united through holding companies. On the properties where all of the energy is consumed locally in transportation and other railway uses the motive power department virtually sells energy to the transportation department. It is highly important, therefore, for every railway management to know exactly what energy is worth locally, and what the profit is, either when buying or selling or producing for home consumption.

At a meeting of the American Institute of Electrical Engineers, held on April 26, L. B. Stillwell stated that in a 50,000-kw. steam plant with a load of 50 per cent load factor the total cost of energy varies from about 0.4 cent per kilowatt-hour with coal at $1 per ton to 0.75 cent with $5 coal. He assumed a unit power plant cost of $63.70 per kilowatt. The Cleveland controversy over the question of the purchase of additional power for the railway from the central station company or from the Municipal plant, which was just settled, has brought out some fundamental facts. The Engineering Association committee on power generation submitted some valuable tables at the Atlantic City convention giving detailed costs for a number of typical plants. Unfortunately these data were printed for private circulation only, but they are available to members of the association. They show annual average operating costs between about 0.3 cent and 0.6 cent per kilowatt-hr. with load factors from 33 per cent to 44 per cent and outputs between 40,000,000 and 130,000,000 kw.-hr. per year.

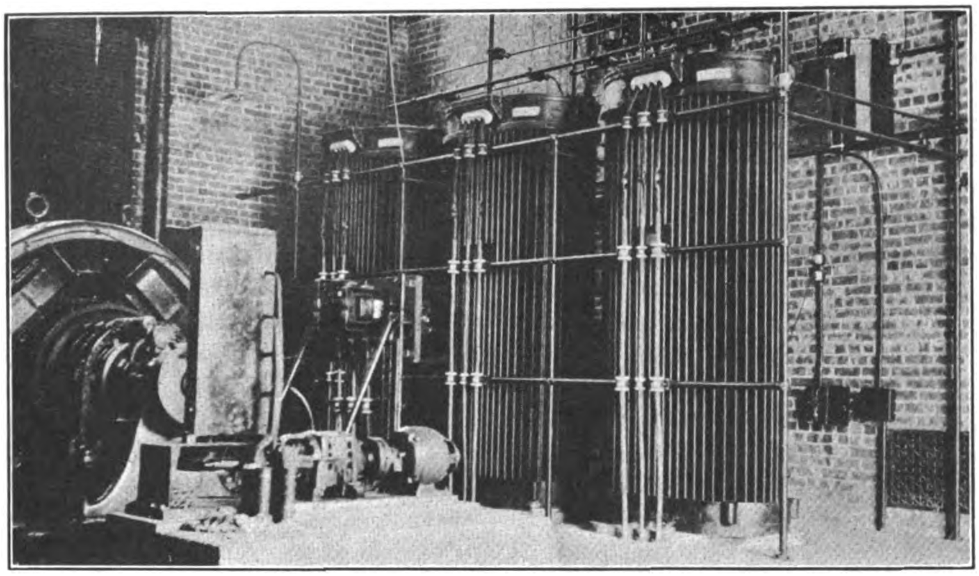
So great is the interest in the subject of energy purchase and sale by railways and so active are the central station companies in going after central station load that the ELECTRIC RAILWAY JOURNAL has found it desirable to investigate the present status of this business with the aid of the *McGraw Electric Railway Directory*. On account of the complicated organization of many companies the results can be stated only approximately, but they will serve as a general guide and as supplementary to the data given in the latest report of the Bureau of the Census. It appears that about 18 per cent of the electric railway companies in this country are doing a supplementary power business and 24 per cent a lighting business. Of the total number 55 per cent generate their own power and 45 per cent purchase power, these classes overlapping to the extent of about 2 per cent. The railways generating power operate roughly 70 per cent of the mileage and 74 per cent of the rolling stock, indicating that in spite of the tendency toward purchasing, to which reference has been made in these columns from time to time and to which the latest census report directs special attention, the railways are still far from going out of the power business. Indeed, many of them are making a good profit by adding to their commercial load.

Whether purchase or sale of power is profitable or not depends so much upon local conditions that no general rule is applicable. The whole matter was summarized in H. G. Stott's New Haven paper, abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for June 24, 1916, page 1170. He pointed out that it comes down ultimately to the question of load factor. That is, the plant which has the most nearly uniform load can, everything else being equal, produce energy most cheaply. It is of minor importance who owns and operates the plant. There is, of course, the related question of reliability, for no railway can afford to risk preventable interruption of power supply. This risk, however, is not as great as it was a few years ago for the perfecting of protective devices has rendered electrical energy supply remarkably continuous.

The most difficult feature of this whole subject is the calculation of the exact cost of electrical energy. The fuel, water, labor and other operating components of cost can be obtained from the records, but the overhead charges must be estimated and thus uncertain elements are brought in. It is customary to assume certain interest and depreciation rates which must porvide for keeping the plant in an assumed "per cent condition." But no prophet can tell what a year will bring forth in the way of technical progress, necessitating the retirement from service of generating units mechanically perfect. Take for example the virtual crowding out of the reciprocating engine by the steam turbine, and in turn that of the vertical turbine by the horizontal. Such a process is expensive but is incident to progress. It is a factor in the cost of power. Fortunately, the unit cost of power plant, *i.e.*, the investment cost per kilowatt, is decreasing. This fact combined with an accompanying load factor improvement accounts for a greatly increased annual output per dollar invested. Investment in plant and depreciation thereof are, therefore, less important than formerly. It should thus be easier as time goes on to calculate the cost of power. The technical association committees which are working along this line should, however, be given every possible facility for their work.

Automatic Substations Permit Large Saving in Des Moines

First Cost of Seven City Substations Under Construction Is $140,000 Less Than the Cost of Manually-Operated Converters and Feeder System for Equal Losses—Present Plan Calls for Ten Automatic Substations, City and Interurban—$90,000 Worth of Copper in Old Feeder System Is to Be Taken Down and Sold



BANK OF TRANSFORMERS, TWELFTH AND HIGH STREETS, AUTOMATIC SUBSTATION, DES MOINES, IOWA

THE first example of the application of the automatic substation to an entire city property is the installation now being made in Des Moines, Iowa. Four automatic substations including one portable substation are now in operation and seven more are under construction or on order.

The principle of the automatic substation is already familiar to the readers of the ELECTRIC RAILWAY JOURNAL through several articles which have been published. It is that variation in line voltage is utilized to control the starting and stopping of rotary converters, and the switching operations. The details of operation of an early installation were presented in the issue of ELECTRIC RAILWAY JOURNAL for Sept. 18, 1915, page 583, where the equipment of the Elgin & Belvidere Electric Railway was described. The equipment as installed at Des Moines is in all essentials identical with that in the earlier installation, except for some refinements in the control apparatus.

TWO PLANS FOR INCREASING LINE CAPACITY

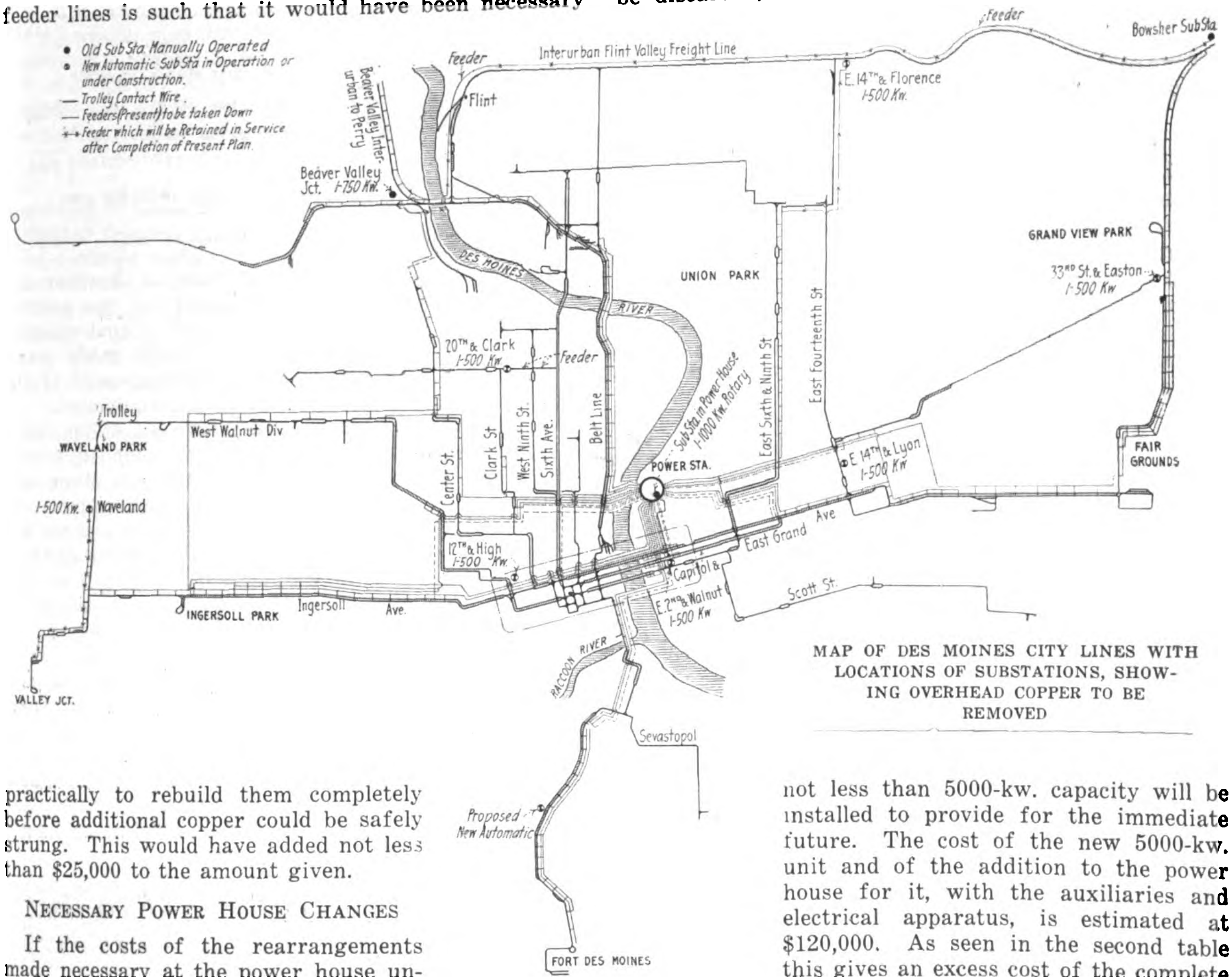
The plan in general includes the complete operation of the lines of the Des Moines City Railway from automatic substations and the supply of power to the Inter-Urban Railway, which is under the same management, at points intermediate to the present substations in order to provide for the very heavy freight traffic and to eliminate the excessive voltage drop. For the present there will be seven automatic rotary converters on the city lines and three on the interurban lines located as shown on the accompanying maps. Plans not yet complete involve two additional machines on the city lines and several more on the interurban lines.

The introduction of the automatic substation in electric railway work came at a time fortunate for the Des Moines properties. The company had been fighting for fifteen years to gain a franchise, in the meantime being hampered in financing new work needed to keep the property up to the greatly increasing transportation needs of the city and surrounding territory. The power loss due to insufficiency of copper in the lines was excessive, so great in certain localities that it was at times barely possible to move the cars. Then upon the granting of a franchise last year forty new four-motor cars were purchased and placed in service, rendering imperative the bettering of the conditions in the direct-current feeder system.

With money available, the first impulse, of course, was to put up more copper. It was estimated, however, that the cost of putting the city feeder system into such a condition that the losses would approximate 10 per cent, would be about $345,000. This estimate was made after an exhaustive study of the conditions, involving the making of many thousand voltage readings at numerous points on the city lines. It included the cost of installing two additional 1000-kw. rotary converters at the power house.

A study of the possibilities of the automatic substation was then made, and it was found that for the city alone an adequate distribution system giving voltage regulation equal to or better than would have been obtained under the previous plan could be installed for $51,500 less first cost. To this could be added the sum of $90,000, the value of the copper which was no longer necessary and could be taken down and sold. The detailed estimates are given in Table I.

Under the latter plan it was, of course, necessary to erect transmission lines to the several new substations, at a cost estimated at $2000 a mile. The first cost was materially lessened by installing auto-transformers and equipment for doubling the power plant generating voltage to transmit at 4400 volts instead of 2200 volts. The total cost of $345,000 under the first plan is in reality not a fair figure with which to compare the cost of the automatic-substation plan for the condition of the feeder lines is such that it would have been necessary practically to rebuild them completely before additional copper could be safely strung. This would have added not less than $25,000 to the amount given.


● Old Sub Sta. Manually Operated
● New Automatic Sub Sta in Operation or under Construction.
— Trolley Contact Wire.
— Feeders (Present) to be taken Down
+—+ Feeder which will be Retained in Service after Completion of Present Plan.
Feeder
Interurban Flint Valley Freight Line
Feeder
Bowsher Sub Sta.
E. 14th & Florence 1-500 Kw.
Beaver Valley Interurban to Perry
Flint
Beaver Valley Jct. 1-750 Kw.
DES MOINES
RIVER
UNION PARK
GRAND VIEW PARK
33rd St. & Easton 1-500 Kw
20th & Clark 1-500 Kw
Feeder
East Fourteenth St
East Sixth & Ninth St
Sub Sta in Power House 1-1000 Kw. Rotary
Belt Line
Sixth Ave.
West Ninth St.
Clark St
Center St.
Trolley
WAVELAND PARK
West Walnut Div
POWER STA.
E. 14th & Lyon 1-500 Kw
FAIR GROUNDS
1-500 Kw. Waveland
12th & High 1-500 Kw.
East Grand Ave
Capitol &
E. 2nd & Walnut 1-500 Kw
Scott St.
INGERSOLL PARK
Ingersoll Ave.
RACCOON RIVER
VALLEY JCT.
Sevastopol
Proposed New Automatic
FORT DES MOINES

MAP OF DES MOINES CITY LINES WITH LOCATIONS OF SUBSTATIONS, SHOWING OVERHEAD COPPER TO BE REMOVED

NECESSARY POWER HOUSE CHANGES

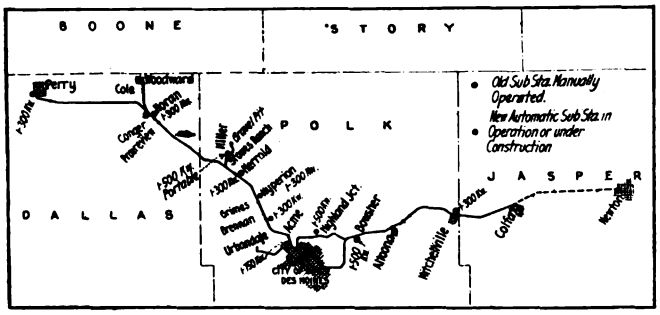
If the costs of the rearrangements made necessary at the power house under the automatic substation plan be included, the total cost is apparently slightly greater than the feeder plan, but this is not really the case, for the following reason: The power house is now equipped with one 2000-kw. and one 1000-kw. turbine units, and two 1000-kw. direct-current reciprocating cross-compound units. With the feeder system taken down, these two direct-current units would be useless, and while they are worth $40,000 in the present plant, they are worth only $5,000 as junk. This $40,000 less the junk value is charged against the substation plan. But before these units and the feeder system can be dispensed with, a new turbo-generator is necessary. While it is essential at the present moment to replace only the equipment to be discarded, which has 2000-kw. capacity, a unit of not less than 5000-kw. capacity will be installed to provide for the immediate future. The cost of the new 5000-kw. unit and of the addition to the power house for it, with the auxiliaries and electrical apparatus, is estimated at $120,000. As seen in the second table this gives an excess cost of the complete automatic substation plan over the feeder plan of $13,300, but increases the station capacity by 3000 kw. and frees the station space previously occupied by the reciprocating units. No provision is made for future growth in the $345,000 feeder plan. Such provision is necessary, as the load is now up to the capacity of the present plant. Estimating at $13,300 the cost of the 3000 kw. of additional capacity, it is secured at a rate of $4.43 per kilowatt. If in the feeder plan $120,000 is added for the cost of a 5000-kw. unit and $25,000 for rebuilding the feeder pole lines, to put the two plans upon a more nearly comparable cost basis, the automatic equipment is seen to be more economical. The complete comparison is given in Table II on page 68.

TABLE I—DETAILED ESTIMATE OF COST OF INSTALLING ADEQUAE DISTRIBUTION SYSTEM

Feeder Plan	
Present feeder copper, at 25 cents per pound	$112,800
Additional copper necessary for proper voltage regulation, at 25 cents	172,500
Two 1000-kw. rotary converters installed in power house, building extension, switchboard, equipment, etc	60,000
	$345,300
Automatic Substation Plan	
Present feeder copper	$112,800
Seven rotary converters and control equipment	98,000
Installation of seven equipments	8,500
Seven substation buildings	21,000
Seventeen miles 4400-volt transmission line	34,000
Miscellaneous material	10,000
Auto transformers for stepping voltage from 2200 to 4400, labor, cable, switching equipment, etc	9,500
	$293,800
Credit feeder copper taken down at 20 cents	90,200
	$203,600
Manually-operated-substations plan, total	$345,300
Automatically-operated-substations plan, total	203,600
Difference	$141,700

PRACTICAL WORKING OUT OF THE PLAN INVOLVING AUTOMATIC SUBSTATIONS

One of the principal features of the automatic substation is the economic possibility of placing stations where the power is needed. In Des Moines practically all cars pass through the downtown "loop" district, indicated on the accompanying map within the light dot-dash line, and the power requirements in this area are consequently very great. In the new plan a substation is placed at either end of the loop. The line losses are cut down so materially thereby that the trolley wire pro-


BOONE
STORY
POLK
DALLAS
JASPER
Perry
Cole
Woodward
Moran
1-300 Kw.
1-300 Kw.
Conger
Prairieview
Millet
Gravel Pit
Stevens Ranch
Herrold
1-500 Kw. Portable
1-300 Kw.
Grimes
Brennan
Urbandale
Valley Junction
1-300 Kw.
1-300 Kw.
Acme
1-750 Kw.
City of Des Moines
1-500 Kw.
Highland Jct.
Bowsher
1-500 Kw.
Altoona
Mitchellville
1-300 Kw.
Colfax
Newton
Old Sub Sta. Manually Operated.
New Automatic Sub Sta. in Operation or under Construction

MAP OF INTERURBAN LINES WITH LOCATIONS OF SUBSTATIONS

vides ample copper and all feeder copper is to be removed. Comparison of the location of these two substations with the former location of the substation nearest to the loop district, the one in the power house, indicates the cause of the saving. Yet the cost of operating a manually-controlled substation placed in the loop would have been greater than the capitalized value of the copper losses involved in supplying direct-current energy from the power house where the station engineer does the operating.

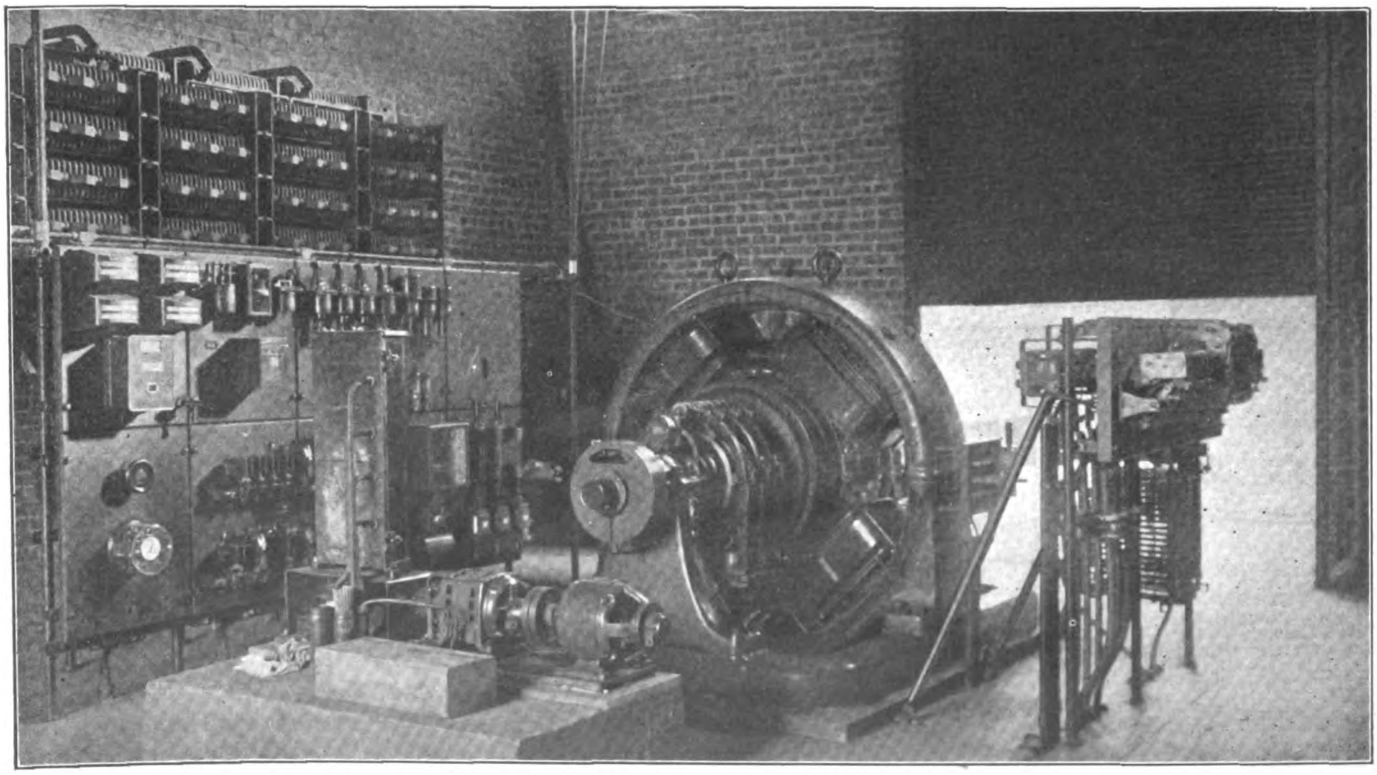
The substation at Twelfth and High Streets is designed for two rotaries which will be arranged so that the second unit will come in on the line only after the load at that point has increased beyond the capacity of the first. One of these units, a 500-kw. machine, is now in operation. A single 500-kw. unit will very shortly be placed in operation at the opposite end of the loop, East Second and Walnut Streets, and the other five automatic stations will be located over the city, as shown in the map, as rapidly as the work can be done. Formerly the entire city lines were supplied from the power house substation, from a few feeders carried back into the city from the Beaver Valley Junction substation on the west division of the interurban, 4.5 miles from the loop, and from the Bowsher substation on the east division of the interurban, 7.4 miles from the loop.

TABLE II—COMPARATIVE COST INCLUDING THE GENERATING STATION CHANGES

Loss due to elimination of two 1000-kw. direct-current reciprocating units	$40,000
Cost of new 5000-kw. turbo-generator installed, extension of station, switchboard equipment, condenser, etc.	120,000
	$160,000
Credit for junk value of two 1,000-kw. direct-current units	5,000
	$155,000
Saving with automatic rather than manual plan, outside of station	141,700
Additional cost with gain of 3000 kw. in capacity	$13,300
Cost per kilowatt of 3000 kw. additional station capacity.	$4.43
Cost of feeder plan from previous table, about	$345,000
Cost of rebuilding feeder pole lines	25,000
Cost of adding 5000 kw. turbine to power house	120,000
	$490,000
Cost of complete automatic substation plan ($203,600 plus $155,000)	358,600
Overall first-cost saving in favor of automatic station	$131,400

On the Colfax division of the Inter-Urban property power is supplied from substations at Bowsher and Mitchellville, which will be retained for the present. An extension of this line to Newton is contemplated, and with its completion a heavy freight traffic is expected which will necessitate a rearrangement of the substations and the use of automatic equipment.

On the west, or Beaver Valley division, of the Inter-Urban property, power was previously supplied by substations at Beaver Valley Junction, Herrold, Moran and Perry, the distances between them being, respectively, 8.7, 11 and 11 miles. Some time ago a gravel pit was opened on the banks of the Des Moines River north of Herrold, and a 2.25-mile spur was built to it to permit the taking of contract for hauling from twenty to forty cars of gravel a day and delivering them to the Chicago, Great Western Railroad at Highland Junction, on the belt line north of the city. Last summer the haul-out of this gravel pit averaged nearly forty cars a day, and this with the other freight haul and the heavy grades and curves on the spur and between Herrold and Beaver Valley Junction caused an excessive drop in voltage. To provide suitable power supply for this profitable carload freight two 300-kw. automatic



CONTROL BOARD, LIMITING RESISTORS, MOTOR-GENERATOR POLARITY REGULATOR, ROTARY CONVERTER AND MACHINE SWITCHES IN TWELFTH AND HIGH STREETS SUBSTATION substations were installed at Brennan and Hyperion, in the 8.7-mile space between Beaver Valley Junction and Herrold substations. The spacing on the section of line between substations was thus made 3.7 miles from Beaver Valley Junction to Brennan; 2.7 miles from Brennan to Hyperion, and 2.3 miles from Hyperion to Herrold. A 500-kw. portable automatic substation was used all during the summer while the gravel pit was in operation at a mid-point on the 2¼-mile spur, as indicated on the map. This portable substation is completely equipped to be used on either the 23,000-volt line supplying the interurban substations or the 4400-volt lines in the city, it being possible to make the change-over from one to the other in a few hours.

In addition to these three substations on the route of the principal freight traffic, another automatic station is being installed midway between the two interurban divisions on the 6-mile connecting belt line north of the city. This will be equipped with one 500-kw. unit and will greatly improve the operating conditions over this belt line, which has a profile with rather stiff grades for heavy traffic both ways. While the capacity represented by these six substations between the gravel pit and the interchange with the Great Western is more than enough for present requirements, it has been planned for the growth expected in the immediate future. It is expected that the output of the gravel pit will be doubled next summer, and this alone will make considerable traffic over these lines.

At Perry, Moran, Herrold, Bowsher and Mitchellville the day operator also acts as station, ticket and freight agent, handles train orders, etc., and as these other duties require the services of a man anyway, the stations will be continued under manual operation for the present. As the business grows, however, and the combined duties become greater than one man can handle, automatic control equipment will be installed. The situation at Perry has very nearly reached the point where it will be necessary to put on a second day operator, and this station will probably be equipped with automatic control at an early date.

Work is being pushed on the construction of the power house extension and the installation of the new 5000-kw. turbine-generator unit in order to make it possible to take down the present feeder system while the copper market is favorable. The work planned at the power house also includes extensive rearrangements designed to bring the whole station up to a thoroughly modern plant. Good operating economy has been gained in the old plant by utilizing the exhaust from the two cross-compound reciprocating units in a mixed-pressure turbine and balancing the load between the alternating-current and direct-current generators by floating a 1000-kw. rotary converter between the two.

ECONOMIES TO BE REALIZED

The figures given in the early paragraphs of this article do not take into consideration the operating savings resulting from the automatic apparatus. Just what these will amount to is difficult to estimate, but it is certain that the saving resulting from the elimination of light-load losses will be very important. At present no station operators are displaced because of the previous location of the city substation at the power house, where the same number of men must be employed anyway, and on interurban lines because of other duties assigned to the operators. But the absence of the labor cost is distinctly the feature which makes it economically possible to place the automatic stations at the places needed to gain this great saving in copper and the much better voltage conditions than possible by any other plan. The gross savings to be realized must remain largely a matter of conjecture until a period of operation brings out the finite results. When the installation is completed, it is expected that one inspector for the interurban substations and one for the city substations will be all the labor necessary to the operation of all the direct-current supply stations, which will probably eventually number upwards of sixteen stations.

The Des Moines installation was laid out and engineered by F. C. Chambers, mechanical and electrical engineer for the company, and the operation of the substations is directly in charge of C. A. Butcher.

Columbus Railway Impresses Safety-First Move by Night as Well as by Day

A large electric sign mounted on the front of the office building of the Columbus Railway, Power & Light Company blazes forth the warning and the company's interest in the safety-first movement, both night and day. As it is the only illuminated sign on the company's office building, it naturally emphasizes the company's position in safety work. It is very plainly distinguishable from the viaduct on High Street in front of the Union Station, which is at a higher elevation than the downtown section of the street, and is, therefore, one of the first things noticed by the traveler as he leaves the station and looks up the main street. In this manner it has attracted a great deal of attention on the part of the strangers in the city as well as the residents.

SAFETY FIRST

ELECTRIC SAFETY-FIRST SIGN ON THE FRONT OF COLUMBUS (OHIO) RAILWAY OFFICE BUILDING

This sign is simply one of the means which the Columbus company has taken to carry on its active work in the interest of safety, and in which it has been unusually successful. The significant features of this work were brought out in a paper read by Harold W. Clapp, general superintendent, before the Central Electric Railway Association recently and published on page 1110 of the Nov. 25, 1916, ELECTRIC RAILWAY JOURNAL.

Consolidation of French Technical Journals

The most important two journals in the electrical field in France, *La Lumière Electrique* and *La Revue Electrique*, have united to form the new *Revue Generale de l'Electricité*. This will be a weekly of about fifty pages each issue, and it will be the official organ of the Union des Syndicats de l'Electricité. The publication will contain four general sections, namely, scientific and technical; industrial; economic and financial, and legislative. The office of publication is 12, Place de Laborde, Paris, and the subscription price in France is 40 francs and in foreign countries 50 francs per annum.

Unit Costs of Construction for Permanent Way

Data Transmitted to Massachusetts Public Service Commission by H. W. Hayes, Engineer of the Commission, Were Gathered from Numerous Sources

In connection with a report to the Massachusetts Public Service Commission by the engineering department of the board for the purpose of comparing construction cost data submitted by the Bay State Street Railway with similar data from other sources, a large amount of material has been assembled which is of interest to estimators. Selections from these data covering permanent way matters are printed below, only such items being listed as appear useful in general practice. In his letter of transmittal to the board, H. W. Hayes, engineer of the commission, states that the cost data presented were obtained from many sources, notably from the purchase records of the Boston Elevated Railway, the Middlesex & Boston Street Railway, Worcester Consolidated Street Railway and other operating properties; from the Massachusetts Highway Commission, Boston Transit Commission, and from dealers and manufacturers. In the following notes, the source of each unit cost figure is given, so far as possible, and so far as feasible, only recent data are included unless otherwise specified.

The Interstate Commerce Commission's classification has been followed in the items listed.

SPECIAL WORK

I. C. C. Acct. No. 508

All costs except final distribution of crossings, crossovers, curves, frogs, switches, mates and portions of track made to order.

Public Service Commission engineering department estimate of average costs of special work (material only) f.o.b. destination in Massachusetts.

Allow 12 ft. of track for switch and mate: 6 ft. for frog.

1915 Costs, 9-In. Girder Rail	Solid Insert	Heavy Insert	Light Insert
Switch, each	$240.00	$190.00	....
Mate, each	160.00	130.00	$117.00
Frog, each	160.00	120.00	108.00
Curved track, per foot	3.80	3.80	3.30
Straight track, per foot	3.20	3.20	2.70

For 7-in. or 6-in. girder, deduct 10 per cent from above prices.

Allow 12 ft. of track for switch and mate: 6 ft. for frog.

1915 Costs T-rail work not more than 4.25 in. high.

	Heavy Insert	Light Insert
Switch, each	Add 10 per cen	$125.00
Mate, each	to 15 per cent	80.00
Frog, each	....	70.00
Curved track, per foot	....	2.50
Straight track, per foot	....	2.00
Z guard, 4.25-in. T-rail		$0.80 per foot
Bar guard, 4.25-in. T-rail		.50 per foot
Split switch turnout ends, 15-ft. points, all accessories and ground throw, single or double spring frogs, average		120.00 per end
Add for frog guards		7.50 each

RAIL

I. C. C. Acct. No. 507

Average prices paid by Boston Elevated Railway f.o.b. destination per gross ton, drilling included.

	Girder Less Than 100 Lb.	Girder Over 100 Lb.	Guard Over 100 Lb.	T Less Than 6 In.	T 6 In. or Over	Tram	Stringer Guard
1910	$39.88	$35.70	....	$33.44	$36.00	.....	$45.00
1911	37.91	40.42	$54.96	31.51	36.00	.....	.....
1912	38.62	39.20	54.93	.....	39.09	.....	.....
1913	39.20	39.09	55.88	35.09	.....	.....	.....
1914	39.26	39.06	56.05	32.40	.....	$48.16	.....
1915	.....	41.27	56.35	.....	39.68	.....	.....

Mill inspection, 1902-1914, $0.05 per ton.

Bay State Street Railway, record of purchases f.o.b. destination, 1906-1913, 12,991 toen (T) at $30.38.

Adding 35 cents for inspection and warehousing. $30.73.

SPIKES

I. C. C. Acct. No. 507

Price per keg of 200 lb.

	Kegs	Per Keg
Bay State Street Railway average to 11-14	.....	$4.10
Middlesex & Boston, 1899-1914	1,329	4.28
Boston Elevated Railway, 1895-1914	24,611	3.90
Worcester Consolidated, 1902-1915	4,295	3.85
Total and average price	30,295	3 91
Add for warehousing 5 per cent	......	.19
Total average price per keg	......	$4.10

GIRDER RAILS

I. C. C. Acct. No. 507

Middlesex & Boston, 1902-1914, 1,583 tons at	$39.09
Boston Elevated Railway, 1902-1914, 22,525 tons at	38.85
Worcester Consolidated and Springfield, 1902-1914, 5,805 tons at	38.82
Average of above, including 35 cents for inspection and warehousing	39.21 per ton

FLAT TIE RODS

I. C. C. Acct. No. 507

Middlesex & Boston, 1902-1914	12,600	at $0.44 each
Worcester Consolidated, 1902-1915	18,063	.37
Boston Elevated Railway, 1894-1914	473,218	.37
Total and average price	503,881	$0.37
Add 5 per cent for warehousing		.02
Total		$0.39

Sise and average price range Boston Elevated flat tie rods, 1894-1914:

2¼ in. x $\frac{7}{16}$ in.	$0.04
1½ in. x $\frac{7}{16}$ in. x 5 ft. 4 in.	.22
2¼ in. x $\frac{11}{16}$ in. x 5 ft. 1¼ in.	.34
2¼ in. x $\frac{11}{16}$ in. x 5 ft. 3⅛ in.	.345

ROUND TIE RODS

I. C. C. Acct. No. 507

Boston Elevated Railway 1894-1914, ⅝ in. x 5 ft. 4½ in.	$0.13
Boston Elevated Railway, 1894-1914, 1 in.	0.30

TIE PLATES

I. C. C. Acct. No. 507

Goldie, 175,120 (Boston Elevated), 1894-1914	$0.11 each

RAIL BRACES

I. C. C. Acct. No. 507

60 lb. and 70 lb. Acme, Bay State records 1911, 500 at	$0.14 each
75 lb. Acme, Bay State records, 1911 at	0.165
45-lb. Niagara, Bay State to November, 1914 at	0.10
75-lb. Lebanon, Bay State to November, 1914 at	0.35

CHANNEL JOINTS ON GIRDER RAIL

I. C. C. Acct. No. 507

Feustel—Bay State Street Railway average to November, 1914, including $0.0002 per pound for warehousing and inspection.

For Sections		Weight		Per Joint
Tram P.S.	No. 200-9-in.	90	22-in. channel; including bolts	$1.57
Tram P.S.	No. 201-9-in.	85	24-in. channel; including bolts	1.68
Girder P.S.	No. 203-9-in.	113	26-in. channel; including bolts	1.80
Girder P.S.	No. 219-9-in.	85	32-in. channel; including bolts	2.29
Guard P.S.	No. 230-9-in.	100	36-in. channel; including bolts	2.53
Guard P.S.	No. 240-9-in.	87	36-in. channel (⅝ in.); including bolts	2.76
Guard girder P.S.	No. 222-8$\frac{11}{16}$-in.	95	22-in. channel; including bolts	1.56
Tram P.S.	No. 223-8$\frac{11}{16}$-in.	96	24-in. channnel; including bolts	1.67
Guard girder P.S.	No. 226-8$\frac{11}{16}$-in.	94	26 in. channel; including bolts	1.79
Guard girder P.S.	No. 229-8$\frac{11}{16}$-in.	84	32-in. channel; including bolts	2.29
Tram P.S.	No. 93-8½-in.	90	36-in. channel; including bolts	2.66
Tram L.S.	No. 206-8$\frac{11}{16}$-in.	96	24-in. channel; including bolts	3.94
Tram L.S.	No. 238-8$\frac{11}{16}$-in.	89	26-in. channel; including bolts	4.18
Tram L.S.	No. 297-8$\frac{11}{16}$-in.	95	32-in. channel; including bolts	4.80
Guard girder L.S.	No. 319-8$\frac{11}{16}$-in.	95	36-in. channel; including bolts	5.38
Girder P.S.	No. 273-9-in.	125	22-in. channel; including bolts	2.06
Girder P.S.	No. 273A-9-in.	133	32-in. channel; including bolts	3.02
Girder B.E.	No. 6-9-in.	132	36-in. channel; including bolts	3.30
Tram P.S.	No. 400-9-in	104	32-in. channel ($\frac{11}{16}$ in.); including bolts, 1912	3.01
Girder P.S.	No. 401-9-in.	104	36-in. channel ($\frac{11}{16}$ in.); including bolts, 1912	3.29
Girder L.S	No. 463-9-in.	104	32-in. channel (¾ in.); including bolts, 1913-14	3.05
Girder L.S.	No. 336-9-in.	94	36-in. channel (¾ in.); including bolts, 1913-14	3.35

Boston Elevated average cost of thirteen purchases of channel joints, adding $0.0002 for warehousing and inspection	$0.0202
Worcester Consolidated for eight $\frac{11}{16}$-in. rail, 26-in. channel, including bolts	1.93
Worcester Consolidated for eight $\frac{11}{16}$-in. rail, 32-in. channel, including bolts	2.38
Barbour-Stockwell Company 119 lb. 32-in. channel, including bolts, average	3.75
Barbour-Stockwell Company 134 lb. 36-in. channel, including bolts, average	4.15

BOLTED STEP OR COMPROMISE JOINTS

I. C. C. Acct. No. 507

Feustel—Bay State average 1912-1914 including $0.0002 for warehousing and inspection.

	Each
T-rail to T-rail	$3.10
T-rail to girder rail	6.50
Girder rail to girder rail	5.50

Average of five Massachusetts street railways:

T-rail to T-rail (range $2.83-$4.06)	3.27
T-rail to girder rail (range $4.43-$6.78)	6.04
Four railways—Girder rail to girder rail (range $3.86-$6.40)	5.09

FISH PLATES

I. C. C. Acct. No. 507

Feustel—Bay State Street Railway average prices 1912-1914, including $0.0002.

	Per Joint
For 35 lb. T-rail, 24-in. fish plate, with bolts	$0.25
For 40 lb. T-rail, 24-in. fish plate, with bolts	0.29

BONZANO JOINTS

I. C. C. Acct. No. 507

Feustel—Bay State Street Railway average price 1912-1914, including $0.0002 for warehousing and inspection.

For 60-lb. T-rail, 24-in. Bonzano with bolts	$0 90
For 67-lb. T-rail, 24-in. Bonzano with bolts	1.02
For 70-lb. T-rail, 24-in. Bonzano with bolts	1.11
For 75-lb. T-rail, 24-in. Bonzano with bolts	1.27
Boston Elevated Railway, 24-in. for 70-lb. T-rail, 1912	1.50

WELDED JOINTS ON GIRDER RAIL

I. C. C Acct. No. 507

Feustel—Bay State Street Railway average prices to November, 1914, including $0.0002 for warehousing and inspection.

Lorain joints	$5.45
Lorain joints, head-supported	6.45
Thermit	12.00

ANGLE-BAR JOINTS

I. C. C. Acct. No. 507

	Per Lb.
Boston Elevated Railway, weighted average, 5600 joints, without inspection	$0.0194
Boston Elevated Railway, weighted average, 1459 joints, average for T-rail over 60 lb.	0.0215
	Per Joint
Boston Elevated Railway, 24-in. for 45-lb. T-rail	$0.31-$0.48
Worcester Consolidated 24-in. for 70-lb. T-rail, 1915	0.77

CONTINUOUS JOINTS

I. C. C. Acct. No. 507

	Per Joint
Bay State purchases 32-in. contin. girder rail, 1912	$4.75
Bay State purchases 36-in. contin. girder rail, 1913	5.60
Boston Elevated purchases 24-in. contin. for 58-60-lb. T-rail, 1901	1.17
Middlesex & Boston purchases 24-in. contin. for 58-60-lb. T-rail, 1915	1.40
Middlesex & Boston purchases 24 in. contin. for 70-lb. T-rail, 1915	1.52

WEBER JOINTS

I. C. C. Acct. No. 507

Feustel—Bay State Street Railway average to November, 1914, including $0.0002 per pound for warehousing and inspection.

For sections No. 222, etc., 26-in. Weber complete	$3.94
60-lb. T-rail, 24-in. Weber complete	1.55
70-lb. T-rail, 24 in. Weber complete	1.65
75-lb. T-rail, 24-in. Weber complete	1.83

GRADING

I. C. C. Acct. No. 504

Feustel—Bay State Street Railway to November, 1914.

	Per Cubic Yard	
Track trench in city	$0.60	
City line eastern Massachusetts, 11,530 ft. track, by company	.616	
Earth excavation country lines—Feustel-Bay State Street Railway to November, 1914	0.38	
Fifteen Massachusetts railroads, 1907-1914, earth excavation, country	0.423	
Rock excavation Feustel-Bay State Street Railway to November, 1914	1.82	
Rock excavation four Massachusetts railroads, 1907-1914	1.50	
Loose rock excavation, Feustel-Bay State Street Railway	1.00	
Rip Rap—rough, Feustel-Bay State Street Railway	2.00	
Rip Rap carefully placed, Feustel-Bay State Street Railway	1.50	
Dry rubble for retaining walls, Feustel-Bay State Street Railway	5.00	
Rubble masonry for retaining walls, Feustel-Bay State Street Railway	6.50	
Track and side catch basins, 14 in. x 14 in. cover and frame, Feustel B. S.	7.00	each
Track and side catch basins, 15 in. circular cover and frame, Feustel B. S.	7.00	each
Track and side catch basins, 20-in. circular cover and frame, Feustel B. S.	8.00	each
Track and side catch basins, 24-in. x 24-in. cover and frame Feustel B. S.	12.00	each
Track and side catch basins 30 in. x 30-in. cover and frame Feustel B. S.	16.00	each

GRAVEL

C. C. Acct. No. 55d

	Per Cubic Yd
Feustel-Bay State Street Railway to November 1914	$0.60
Boston Elevated 1913-1915, on wharf from sea bed	.50
Worcester Consolidated, 1907-1914, estimated haul 5 miles; including pitcost $0.05	.54
Crushed rock, Boston Elevated, 1915, 16,039 ft. of track	1.40
Crushed rock, Massachusetts Highway Commission, local stone, 292 contracts	1.44
Crushed rock, Massachusetts Highway Commission, trap rock, 447 contracts	2.06

TIES

I. C. C. Acct. No. 506

	Each
Chestnut 6 in. x 8 in. x 8 ft. Bay State, 1910-1914	$0.62
Chestnut, 6 in. x 8 in. x 8 ft. Springfield Street Railway, 1910-1914, 206,351 ties	0.469
Chestnut, 6 in. x 8 in. x 8 ft. Worcester Consolidated, 1910-1914, 397,565 ties	0.465
Chestnut, 6 in. x 8 in. x 7 ft. Boston Elevated, 1909-1913, 127,723 ties	0.612
Treated ties delivered to storage yard:	
Boston Elevated, 6 in. x 8 in. x 8 ft. hard pine, creosoted, sawed, 1915	$0.99

Fares in Annexed Districts

United States Supreme Court Decides It Has Jurisdiction in Detroit Case and That Annexation of Suburban Districts by Municipality Does Not Extend City Fare to Those Districts

A SHORT reference to the decision of the United States Supreme Court, delivered Dec. 11, 1916, in the case of the Detroit United Railway, plaintiff in error against the people of the State of Michigan and also against the city of Detroit, carried up from the Supreme Court of the State of Michigan, was mentioned in the issue of this paper for Dec. 16, page 1271. The full text of the decision, which was delivered by Justice Pitney, is now available. It is upon a matter which is of considerable importance to a number of railway companies, as it involves the right of a city to claim the extension of the city fare of an electric railway in districts annexed to the city subsequent to the agreement between the city and the railway.

The decision first rehearses the history of the case, telling that the Detroit United Railway, which was incorporated in 1900, united under one organization certain lines previously constructed and operated independently in the city and its suburbs under different and distinct franchises. Among these were the Detroit City Railway and the Grand River Street Railway, each in the city of Detroit with a franchise which required the sale at certain hours of eight tickets for 25 cents, and the Grand River Electric Railway in the township of Greenfield without this provision. The Grand River Electric Railway was a different corporation than the Grand River Street Railway. In 1905 and 1907 the city annexed part of Greenfield township and claimed that the low rate of fare mentioned was applicable to all of the lines of the Detroit United Railway within the city, not only as its limits existed in 1889, when the Grand River Street Railway received a franchise to extend its tracks to the city limits, but also to the lines in the territory annexed in 1905 and 1907. In the legislation authorizing this annexation it was stated that the annexed territory should be subject to all the laws of the State applicable to the city and to all the ordinances and regulations of the city, with exceptions not material to this case. The railway company took the case to the State Supreme Court on the ground that these acts were in conflict with Sec. 10 of Art. 1 of the Federal constitution.

The decision delivered by Justice Pitney then discusses the question of jurisdiction in the case. It says that the United States Supreme Court has many times decided that the "contract clause" of the constitution is not intended to cover "such impairments of contract obligations, if any, as may arise by mere judicial decisions in the state courts without action by the legislative authority of the state. But in this case there were state laws passed subsequent to the making of the alleged contracts in question, in the form of the legislation of 1905 and 1907 extending the corporate limits of the city; and it is not correct to say that the decisions of the state court turned upon the mere meaning of these contracts without reference to these subsequent laws." "It is too well settled," the court says later, "to be opened to further debate that where this court is called upon in the exercise of its jurisdiction to decide whether state legislation impairs the obligation of a contract, we are required to determine upon our independent judgment these questions: (1) Was there a contract? (2) If so, what obligation arose from it? and (3) Has that obligation been impaired by subsequent legislation?"

The decision then takes up the question as to whether, by voluntary action of the parties between the making of the suburban grant and the passage of the annexation act, the obligations arising out of these grants had been modified, and holds that they were not. It says: "Defendants in error invoke the established rule that the terms of a municipal grant or franchise should be construed strictly as against the grantees and as favorably to the grantor as its terms permit. The state court deemed the rule to be applicable. It is at least doubtful, however, whether the rule, properly applied to the facts of these cases does not bear altogether in favor of plaintiff in error. For, of course it is not possible to adopt an extensive construction of the obligations imposed upon the city companies by the ordinances without adopting a like construction as to the extent of the franchises thereby conferred upon the companies. And can it be supposed that if either of these companies had claimd the right to lay down tracks and operate railways in the annexed territory by virtue of the ordinances of 1889, they would not have been met with the rule that municipal grants are to be construed strictly against the grantee, and cannot be extended beyond their expressed terms?"

The decision then goes on to say that "if the city lines had been extended into the annexed territory by either of the city railway companies under any authority conferred by or assumed under the ordinances of 1889, a very different question would have been presented. But such is not the case. We find it impossible to regard the purchase of suburban lines, with their rights, privileges and franchises, as being in effect an extension of the city lines, but at the same time an abrogation of an essential part of the rights and privileges appurtenant to the acquired lines. . . . And since the judgments of the Supreme Court of that state (Michigan) gave such an effect to the annexation acts of 1905 and 1907, in conjunction with the ordinances of 1889, as to impair those obligations, the judgments must be reversed."

A short dissenting opinion was presented by Justice Clarke, who added that he was authorized to state that Justice Brandeis concurred in this dissent.

A. S. C. E. Valuation Report Prepared

Work of Five Years Results in Enunciation of Principles Which Should Control Valuation of Normal Public Utilities—Report Should Clarify This Involved Subject

AFTER five years, during which forty-eight joint meetings have been held and a voluminous correspondence aggregating thirteen substantial volumes has been carried on, the special committee of the American Society of Civil Engineers has prepared an exhaustive report as to the principles and methods to be followed in the valuation of normal railroads and other public utilities. The report, which is published in the December *Proceedings* of the society, contains 230 pages, the report proper being preceded by a twelve-page abstract prepared by the committee. This abstract, somewhat condensed, is published below.

The report of the committee is to be presented to the society on Jan. 17, but it is suggested by the committee that the discussion be continued in writing and that the report be finally presented at the next annual convention in June. The report is signed by Frederic P. Stearns, chairman; Leonard Metcalf, secretary, and William G. Raymond, Jonathan P. Snow, Charles S. Churchill, Henry E. Riggs and William J. Wilgus, the last three having been appointed in 1914 to fill vacancies.

Noteworthy Findings

Estimated original cost is not dependable; original topographical conditions but present-day prices and methods should govern in estimating reproduction cost; all real items of cost but no "higher use" value should enter into the reproduction cost of land; only when provision is made in the rate, or should be in the accounting, for an accumulating fund should a depreciation deduction be made for loss of service life, this to be offset by the fund; and development expense and going value are distinct, the one tangible and the other intangible.

FUNDAMENTAL PRINCIPLES OF VALUATION

In the opinion of the committee the principles and methods must be such that when properly applied the result will be fair to all parties affected and of a nature that will attract to the service of the public capital to build new properties and extend old ones.

New Properties—In the valuation of a new property, if the question of a fair return is at stake, the actual investment in the portion devoted to public use, including working capital and development expense, should be taken as the basis for "fair value." If the same property is to be valued for public acquisition, the basis of "fair value" should be the actual cost, including the money value of services and other considerations involved. If the valuation is to be used for capitalization, the result should be attained in the same way as the return base, except that all parts of the property should be included. If for taxation, whether of a new or old property, the result must accord with the laws of the state, or, where not governed by such laws, should be fixed at a sum consistent with the valuation of other property for taxation.

Old Properties Under Continuous Regulation—In the valuation of an old property, operating without competition and from its inception under commission control as to rates and methods of accounting, and assumed to have been entitled to earn sums sufficiently large to provide for all expenses of maintenance, operation and taxation, depreciation allowances and a fair return on the "fair value" of the property, the owner should be compensated in some way for losses sustained during the early years of operation before the property was tuned up and the business developed, either by including in the valuation the sum of the deficiency of earnings in the early years, with interest compounded annually, or by allowing higher rates of return in subsequent years to offset the early deficiency.

Old Properties Not Under Continuous Regulation—In the valuation of an old property which has not been subject to continuous regulation, not only are the foregoing principles important, but there are many cases in which equity calls for the inclusion of not only the sum representing the sacrifice by the owner but also a further positive or negative sum representing valuable property or rights acquired or lost by the owner as a result of time or through the failure of the public or the owner to assert their authority, the courts holding that the present value of the property should be used rather than its cost.

PHYSICAL PROPERTY INCLUDED

The physical property to be included varies in different cases with the use to which the valuation is to be put and the law governing the case.

Used and Unused Property—In cases of rate regulation, only the property considered devoted to public use should be included, embracing that in active use and also that properly and reasonably held in reserve to insure the safety, economy, sufficiency and continuity of service. In valuations for capitalization and public acquisition all the property should be included.

Retired or Discarded Property—Plant units definitely abandoned and not likely again to be used, due to having been worn out in service or by reason of the reconstruction of the property, should be excluded from the valuation and should appear either in a separate schedule of retired or discarded property, or such full statement of the conditions should be made as will definitely fix the status of the units or parts. Temporary works necessarily built in connection with, or required for, the construction of permanent works, or for furnishing service to the public at an earlier date than it could be furnished by the permanent works, should be included in the valuation.

Excessive Size or Capacity—No reduction should be made in the valuation on account of excessive size or capacity, except when the excess is so great as to be clearly unreasonable and is the result of not using proper foresight.

Donated Property—Lands or other property voluntarily donated to a public utility should be included when determining the reproduction cost, on the same basis as land and property otherwise acquired.

Leased Property—In the case of leased property, either the property itself or the lease should be valued, as circumstances may dictate.

Title to Property Not Conclusive.—Structures located on land to which the owner of a public utility has no title should be included in the valuation of the property where the owner has been required by law or necessity to pay their cost, including in this class also property voluntarily donated; and they should be excluded where other public service companies, the public or the users, other than the owner in question, have been required by law or necessity to pay their cost.

Working Capital—It is customary to include under the term "working capital" the amount of cash, materials and supplies provided for use in the plant, but not yet forming a part of it, and other current assets essential for proper maintenance, operation and administration. There should be included an amount of working capital sufficiently large not only to meet the usual requirements but to provide for emergencies.

Securities Owned—Ordinarily, the valuation of property devoted to public use should not include securities owned, or surplus cash not forming a part of working capital, except in instances where such securities and surplus cash are an offset, in whole or in part, for depreciation deducted from the cost of the property.

ORIGINAL COST TO DATE

As defined by the committee, original cost to date is the first cost of the identical property units now in use, including overhead charges.

Difficulties—While much of the difficulty of determining original cost as thus defined in some cases may be removed, especially in the case of short-lived property, it is not feasible to obtain a dependable result where the absence of reliable historic data makes necessary a resort to estimates, as in the case of old properties consisting mainly of long-lived items.

Schedule—Generally it will be found necessary to prepare a schedule in the same way that one would be made for determining the cost of reproduction, many adjustments in the records often being required, even under the most favorable conditions, in order to obtain correct results.

Costs—Unit Costs—When a schedule is necessary, the corresponding costs or unit costs are essential to the completion of the inventory, and where these are unobtainable, as is usually true in the case of property units acquired or created long ago, the ascertainment of the original cost is impossible.

Overhead Charges—Overhead charges are, as a rule, inadequately reflected in the records, and therefore adjustments are required which are largely matters of opinion and speculation, and which, in consequence, make more uncertain the final result, thus often destroying its usefulness.

Development Expense—The expense actually incurred in connection with the tuning up and creation of the business of a property should be included as a part of the original cost to date.

COST OF REPRODUCTION

Estimates of the cost of reproduction should be based on the assumption that the identical property is to be reproduced, rather than a substitute property; that while apparent present-day conditions that would affect the cost of reproducing the property must be considered in any logical estimate, yet history must also be considered to determine what is to be reproduced, the conditions under which it is to be reproduced and how the estimates must be made, and that normal present conditions shall determine the prices and methods for doing the work.

Preliminary Work—The first step in estimating reproduction cost is such a study of the property and its history as will enable the estimator to make a complete list of all items and lay out a proper financial and construction program. The field schedules and inventories should not only be based on complete inspections of the visible physical property, but should also reflect a careful historical search of existing records and other reliable sources of information bearing on items of material or work which entered into or were incidental to actual existing units, special care being exercised to limit the speculative uncertainties as far as possible.

Unit Prices—In determining unit prices a rational sequence of construction should be assumed, and rational assumptions made as to the manner of doing the different parts of the work, whether by company forces or by contract. Unit prices based where possible on the actual cost of doing similar work, in a similar manner, under similar circumstances, should be determined by persons of experience and sound judgment. They should be based on the normal average cost of work for a considerable period—say, five or ten years. In the case of items which are steadily increasing or decreasing in value, the prices adopted should be normal for the time of the valuation. Full consideration should be given to the time allowed for construction, to climatic conditions and to the effect of any other significant conditions or limitations upon the cost of the work.

Reproduction Cost of Land—The determination of the figure to be used should be based in all cases on full consideration of the present normal market value of the area of land acquired and of other recent purchases by the same or other companies of similar lands in the vicinity or in districts of like characteristics; the damage to the remaining land, not required, due to severance and all consequential injuries; the amount and character of the costs of acquisition and overhead charges; enhanced prices due to active demand, and any other real items of cost which would be included in case of purchase. But no allowance should be included for special values coming after the acquisition of the property on account of its new use or on account of a greater earning power under the new use, or for any other hypothetical "value." Estimates should be based on prices and values as of the time of appraisal, be they higher or lower than those prevailing at the time of original acquisition.

Overhead Charges—These charges are a necessary and proper part of cost but are not capable of physical identification after the completion of construction work. They cannot be covered in the estimate of cost of reproduction by the application of specific unit prices; from their nature they attach to the whole or large parts of the property rather than to any particular units. Among such charges are:

(*a*) Cost of promotion.

(*b*) Cost of financing and securing the necessary capital with which to carry out the enterprise.

(*c*) Cost of organization, including the incorporation and organization of the company, securing of franchises, and other like expenditures.

(*d*) Engineering, including the making of the preliminary investigations and plans, plans for the construction of the entire property, the engineering supervision of all construction and other work involved in the development of a property, except such direct supervision as may properly be included in the unit prices of various property units, or as specific charge against some particular schedule or group of units.

(*e*) Administration, including salaries for general officers, agents, accountants, clerks and other assistants not included in the engineering and legal departments, and all administration expenses.

(*f*) Legal expenses, including salaries and expenses of law officials and costs of litigation which, depending on the character of the property and its location, may be a comparatively minor item or a very large one.

(*g*) Interest during the period of construction.

(*h*) Taxes and insurance during construction.

(*i*) Contingencies.

HOW DEPRECIATION SHOULD BE HANDLED

With a desire to remove the ambiguity and resulting confusion that has attended the use of the term "depreciation" in connection with valuation, the committee has considered the subject from three standpoints: (1) The cause, *decretion* or loss of service life; (2) the record, *accounting depreciation*, or the money allowance made in bookkeeping to offset accruing loss of service life; and (3) the amount sought, *depreciation of valuation* or *fair depreciation*, the sum which should be deducted from original cost to date or from estimated cost of reproduction new as a step in finding that which the courts have called "fair value."

Decretion or Loss of Service Life—Decretion is the fact of loss of service life of a physical property, property unit or item, regardless of its effect on value or anything else. It may be due to use, inadequacy, obsolescence or accident, either singly or in combination. Although, in a well-maintained property, decretion is always present in some degree, yet in some cases this decretion, converted into loss of value, which loss is hereafter called cost of decretion, should not be considered deductible in finding property value.

Accounting Depreciation.—The fundamentals of the methods of accounting for depreciation are that the owner of a public utility is under obligation to the investors in its securities to maintain the integrity of the investment as a continuing property and to furnish suitable service to the public; that the public is under obligation to the owner to pay a fair price for the service rendered, which should cover all operating expenses, a proper allowance for depreciation and a fair return upon the "fair value" of the property, and that the return to the investor and the rates to the consumer should be kept reasonably stable and uniform from year to year and should be fair.

The four methods that may be used in connection with accounting for depreciation, the replacement method, the straight-line method, the compound-interest method (formerly called by the committee the "equal-annual-payment method"), and the sinking-fund method, yield identical total costs when the whole life of a property unit is considered, and any one of them seeming to be the most convenient may be chosen, provided under the circumstances it is legal, safe and fair.

The replacement method is applicable to short-lived properties or parts of properties made up of a large number of items, the replacement or retirement of which proceeds after a time with fair regularity and causes no troublesome variations in return or service rates. The straight-line method applies to property units having more than a year of service life, which are assumed to depreciate uniformly from the beginning to the end of service life. The compound-interest and sinking-fund methods apply to property units the depreciation of which is assumed to progress at the same rate as a sinking fund grows from an annuity, accumulating at compound interest.

Depreciation of Valuation—Finding the cost of decretion is a step in the determination of depreciation, but whether and to what extent, if at all, the estimate thus found shall be treated as depreciation of valuation may be, and very probably will be, dependent, at least in part, on the methods of accounting for depreciation and the character of regulation that have prevailed.

If by order or sanction of a regulating body, or by long-continued proper custom under no regulation, a property, as for instance a railroad, has been maintained in normal working condition, necessarily less than new in some or all of its parts, by the replacement method, and at any given date is being valued for any public purpose and at that date shows normal condition, all its several parts being in as good condition as could be expected, the accounts showing that those amounts have been expended in renewals that were necessary to keep the property in normal working condition, and the fact appearing that no expenditure reasonably to be expected could put the property in better than the normal condition in which it is found, and that no unusually large expenditure is presently to be necessary for this purpose, then, in spite of the fact that there is an existing decretion in its several parts, there should be found no depreciation of valuation. Under the method of accounting the public has not paid, and could not pay, for the accrued depreciation, and under this condition its accrued obligation to pay should be considered a company asset.

If parts of the property are maintained under the replacement method and part by some proper allowance method, except as noted below, then depreciation of valuation should be found with respect to those parts maintained under the allowance method, but this depreciation of specific physical units will be made good in whole or in part by existing funds or property purchased with allowances, either or both of which will be included in the valuation as they are found.

If in the judgment of the valuing engineer the replacement method may not be used with propriety for a given property, either because not in accordance with law, or because the method is not adapted to the property, then, whether or not the property has been maintained in the past under this method, the valuing engineer should estimate depreciation of valuation in the amount of the cost of the decretion he finds.

When a comparatively new property, other than a railroad, is to be valued, and it has not been under any regulation that has affected its accounting methods, the law as laid down in the Knoxville decision would seem to make it necessary to find depreciation of valuation equal to the cost of decretion found for all items, whether or not maintained by the replacement method. This might sometimes be unjust; the engineer should then report facts with recommendations as to equity.

If the straight-line, compound-interest or sinking-fund method has been used in computing depreciation, and the method of accounting for it has been prescribed by a regulating body or voluntarily followed by a company owner from the beginning, the same theory, as far as it applies to the property in question, should be used for estimating the cost of decretion; and the entire cost so found, lessened by any accumulated depreciation funds, will appear as depreciation of valuation, unless the sinking-fund method of accounting has been used. In the latter case, if the valuation has to do with the reasonableness of the return and the accounting is to go on as before, apparently existing depreciation would not be depreciation of valuation, and therefore would not be deductible; but if the valuation has to do with condemnation or purchase, then, as in other cases, the apparently existing depreciation is depreciation of valuation, and the owner should receive the depreciated value of the physical property and the existing fund.

Methods of accounting in force at the present time which make proper provision for the accruing depreciation should not have full weight if, in previous years during the life of the property units, other methods were in use which did not make provision for such depreciation. The amount of depreciation of valuation in such cases should be equivalent to the accumulated contributions of the public for depreciation allowances under the various methods of accounting which have affected the property unit from time to time. The public is still under obligation to make good that part of the loss of service life not yet paid for, and this obligation should be considered as much the property of the company usable to offset accrued depreciation as renewal funds or property actually in existence.

If regulation has not fixed accounting methods, but has limited the earnings, it should be permissible to inquire whether the limited earnings have been sufficient to pay operating expense, depreciation, and fair return. If so, depreciation found should be considered depreciation of valuation to the extent warranted by the accounting methods lawfully or properly followed; if not, a question arises. It is remembered that the duty of the company owner is first to maintain the property "before coming to the question of profit at all," and that it is the duty of the regulating body to see that rates are such as to permit the company owner to earn operating expenses, depreciation and fair return. If the regulating body has made sufficient earnings impossible, is it still the duty of the company owner to maintain the property before paying fair return to its security holders? If it is, depreciation of valuation should be found in the amount of the total cost of decretion or so far as warranted by the accounting methods followed. If not, depreciation found should not be considered depreciation of valuation except to the extent covered by earnings after deducting operating expenses and fair return. This is a matter of equity to be determined by a court.

The valuing engineer should bear in mind that when a company has invested a reasonable sum in a property for public service, it is entitled to, but not guaranteed, a fair return on its investment, so long as the money remains in the property, either as property, funds or accrued public obligation to pay. Therefore, so long as the owner keeps a sum equivalent to the total investment at work for the public, either as property serving the public or funds held in reserve for such property, no policy should be followed in estimating depreciation that will reduce the property to a value less than the investment, or, when using cost of reproduction less depreciation as a basis of "fair value," to a value less than the cost of reproduction of that part of the property estimated to have been created with company funds or acquired by gift or in any way not the result of public contributions to cover depreciation.

APPRECIATION

Appreciation, largely the result of solidification, seasoning and adaptation, represents the improvement in quality and usefulness of certain parts of the physical properties of a railroad or other public-utility property. It results from the lapse of time, from work not specifically charged to capital account, from maintenance, from use, etc., and covers items, not represented either by the quantities or unit prices, that are determined in connection with a valuation. There should be no general setting off of appreciation against depreciation, but appreciation should be determined independently from depreciation. Care must be taken that items of labor and expense included in the estimate may not be duplicated in development expense.

DEVELOPMENT EXPENSE AND INTANGIBLE VALUE

In the production of a normal going property, development expense almost invariably is an unavoidable real cost, and is measured by the difference between the amount which the company is entitled to earn in the early years and the amount which it actually does earn. The portion of this expense incurred in tuning up the property and bringing it to its present state of operating efficiency may be included in the cost of construction, and the remainder may be treated as the cost of acquiring the business.

The intangible value that pertains to a property and should be given due weight in the ascertainment of "fair value" is the difference between the tangible value —that is to say, proper cost including development expense, less depreciation of valuation—and exchange value, in which is reflected existing and potential dependable income and beneficial results. It embraces going value, in which is merged good will, franchise value, efficiency, favorable business arrangements and design; and other elements, such as leases, easements, water rights, traffic and operating agreements, strategic location and advantages, and other privileges.

With reference to intangible value as a whole, the committee takes the ground that, in finding original or reproduction cost, there must be included, first, the tangible elements, which can be separately scheduled with an attached value based on concrete facts, and, second, that pertinent facts bearing upon intangible values should thereafter be developed independently, as an aid in the formation of sound judgment as to their value. Exceptional efficiency should be recognized by courts and commissions when appraising property.

Results of Kansas City Railways Safety Campaign

The excellent work in promoting public observance of safety and attention to the subject by the Kansas City (Mo.) Railways is conceded to have been chiefly responsible for the success of a week's campaign for members by the local Safety Council of Kansas City. C. W. Price, field secretary of the National Safety Council, assisted in the campaign, which netted about thirty new members. The local Safety Council has grown from fifteen to more than sixty members in two months. In nearly every case the firm visited expressed itself as eager to participate in the safety work, and signed the application. In several cases secretaries of central organizations asked for material which they could send to their members with letters urging them to join the national council. An association of business men was addressed each noon, and three of the high schools devoted their weekly program to safety.

Washington Railway Relief Paid $13,000

Nearly $13,000 was paid out in sick and death benefits by the Washington Railway Relief Association during the year ended Sept. 30, the annual statement of the association shows. The organization is composed of about 1200 employees of the Washington Railway & Electric Company, Washington, D. C., who are assessed at the rate of $1 a month. For the past year each member received a refund of $8.77, which made the insurance cost exactly 27 cents a month. The sum of $9,485 was paid out in sick benefits and $3,270 in death benefits, the total showing an increase of $4,404.25 over the amount paid out during the preceding year. Since its organization, sixteen years ago, the association has disbursed more than $100,000 on account of sick benefits and $33,000 on account of death benefits, and now has cash and securities on hand amounting to $100,651.

ASSOCIATION NEWS

Motion-Picture Film Showing the Development of Transportation Displayed at Portland Company Section Meeting—Capital Traction Section Celebrates Its First Anniversary—Signals and Heavy Traction Were Discussed at the Connecticut Company Section Meeting

"King of the Rails" Film Shown in Portland

Two hundred persons sat down to supper preliminary to the Dec. 20 meeting of the Cumberland County Power & Light Company section. After a short business session, at which seventeen new members were admitted, the meeting was turned over to the entertainment committee. The section orchestra made its debut, and singing and exhibition dancing also contributed to the success of the evening.

M. R. Griffith of the Boston office of the General Electric Company showed and explained a motion picture film entitled "The King of the Rails." This showed the development of transportation from the early days, leading up to the Chicago, Milwaukee & St. Paul Railway electrification.

First Anniversary Celebration of Section No. 8

On Jan. 11 the Capital Traction Company section celebrated the first anniversary of its founding with an attendance of 130. George E. Hamilton, president of the company, was the principal speaker. Greetings from the Washington Ry. & El. Co. section were presented by President J. T. Moffett. A talented local cartoonist gave a "stunt" chalk talk, and a number of those present furnished good music. A buffet lunch was served at the close.

In congratulating the section upon the completion of a successful year's work Mr. Hamilton said that this effort to bring the men into closer touch, to teach them to look broadly at their work, was one of the best things that had ever come into the life of the company. He repeated some things which he had said a year before, in part as follows:

"I am a believer in the association of men, especially of men engaged in the same or similar work. It gives opportunity for useful discussion, and discussion aids thought, stimulates inquiry and invites criticism. It produces knowledge and concentrates effort. It promotes good fellowship and teaches men the value of coordination in view, effort and direction. It is good for the men and good for the interests they serve. Association develops organization, and organization promotes efficiency; efficiency is power, and power well directed compels success. So I am a believer in and an advocate of this association, and my sympathy and cooperation, personal and official, is with the intent and purpose of this meeting. We serve ourselves when we serve well the company and the public, and the fact that we are a public service corporation should never be forgotten. The least of us can by association and all that association brings take on the strength, that comes with a fuller knowledge and a wider understanding, to meet manfully and well our three-fold duty: to ourselves, to the company and to the public we serve."

Continuing this line of thought Mr. Hamilton said in part:

"An organization of this kind brings us together, makes us all see what each is doing, and gives new impetus to our minds and a firmer and a fuller purpose to every man who is striving to do what is right. It teaches us what a service corporation is; shows us that because we are members of this service corporation we have assumed duties that we cannot lightly consider, duties that will compel us thoughtfully to perform all of the obligations that we assume. It shows us the part that each is playing in the performance of this duty. If we learn our lesson well, if all of us engaged in this common enterprise feel and, feeling, measure up to the obligations that we assume, then indeed are we doing the work of men.

"This close contact teaches us more. It brings into the lives of all of us the spirit of service and teaches us what service is."

January Meeting of Section No. 7

Signals, heavy traction and boosting the company were the topics discussed at the twelfth meeting of the Connecticut Company section held on Jan. 9. The usual dinner was held, with an attendance of 125 members and guests, after which George Pfurr, general line foreman Waterbury division, gave an illustrated talk on "Signal and Dispatching Systems Used on the Waterbury Division." He described the working mechanisms forming parts of these systems.

The next speaker was Nathan B. Stone, president of the publicity club of the Chamber of Commerce of New Haven, who chose for his topic "Lux et Veritas." With this as a basis he explained what the public expects from the street railway, and suggested several ways of boosting the Connecticut Company.

George H. Hill, assistant engineer railway and traction department General Electric Company, Schenectady, N. Y., then spoke on the C. M. & St. P. Railway electrification, using lantern slides and moving picture films.

During the dinner the section orchestra played and two soloists gave vocal numbers.

Western Society of Engineers Elects Officers

At the forty-seventh annual meeting and dinner of the Western Society of Engineers, held in Chicago on Jan. 10, the result of the election of officers was announced as follows: President, H. J. Burt, structural engineer Holabird & Roche, Chicago; first vice-president, D. W. Roper, superintendent street department Commonwealth Edison Company, Chicago; second vice-president, J. N. Hatch, consulting engineer, Chicago; third vice-president, W. W. DeBerard, Western editor *Engineering Record*, Chicago; treasurer, C. R. Dart, bridge engineer Sanitary District of Chicago.

James Keeley, editor and publisher of the Chicago *Herald*, addressed the meeting on the conditions in Europe and what may be expected after the war, and Dean F. E. Turneaure of the University of Wisconsin made some remarks on the relations of the engineering school and the engineering profession.

COMMUNICATIONS

Advertising in Company Publications

[NOTE.—The letters printed below were received in response to an inquiry addressed by the ELECTRIC RAILWAY JOURNAL to three of the companies which publish employees' magazines without advertising of the character criticized editorially in our issue of last week. This inquiry was designed to bring out the reasons for the policy followed by these companies. We shall be pleased to print other comment by our readers on this subject, in which we believe an important and fundamental principle is involved.—EDS.]

UNITED RAILWAYS COMPANY OF ST. LOUIS
ST. LOUIS, MO., Jan. 8, 1917.

To the Editors:

Answering your inquiry as to the policy of the United Railways Company of St. Louis in soliciting advertising for the monthly bulletin which we publish for the information of our employees, I will state that when this publication was first suggested we considered the matter of soliciting advertising to pay for a portion of the cost of the magazine.

We decided against such solicitation for the reason that we felt that any such advertising would be given, not because the advertiser desired it for its publicity value, but because he would regard such solicitation as a demand from the Railways Company which he could not refuse. We do not wish to place ourselves in the position of making such demands, and furthermore, we wished the publication to be entirely independent and not have the editor feel that he was under obligation to any advertising concern.

Our *United Railways Bulletin* is now two years old and has increased in size from twelve to twenty-four pages, with a circulation of about 10,000 once a month, and we have no reason to contemplate a change in our policy.

RICHARD MCCULLOCH, President.

VIRGINIA RAILWAY & POWER COMPANY
RICHMOND, VA., Jan. 8, 1917.

To the Editors:

In reply to letter of Jan. 5 on the subject of employees' magazines I desire to say that we are heartily in accord with the views of W. S. Thompson of the Grand Trunk Railway in reference to advertising in company publications.

The whole value of such publications in the street railway business is to establish a live contact between the company and its patrons. To carry advertising we believe would needlessly antagonize private enterprises engaged in the various branches of the advertising business who would resent the intrusion of a new advertising agency entering a "closed field."

If we were to consent to carry advertisements, the easiest way to get such advertising would be to appeal to concerns from whom we purchased supplies. These concerns could expect no benefit whatever from the publicity gained; hence their only motive in complying with the request for such advertising would be to ingratiate themselves into the favor of the company and in the last analysis one cannot escape the conclusion that this would really be a form of graft. For a company publication to recognize this practice is, to our mind, a serious blunder, and we are glad that the question is being so thoroughly discussed through your valuable paper.

THOMAS S. WHEELWRIGHT,
President.

NEW YORK MUNICIPAL RAILWAY CORPORATION
BROOKLYN, N. Y., Jan. 8, 1917.

To the Editors:

I have your request for my views on advertising in company publications. The primary question in regard to local advertising, it seems to me, is what one can afford. If a company is able to get out a publication for free distribution, carrying no advertising and using covers and other prominent positions for art work, educational bulletins, etc., it is obvious that such publication will be more attractive and probably will make a more effective appeal than a publication in which advertisements are carried.

An employees' publication, it seems to me, should be a subject of pride among all those who are responsible for it. If its full value as a unifying influence is to be realized every member of an organization from the president down ought to take a personal interest in having just as high a grade of publication as it is possible to produce.

I have examined most of the company publications of this kind that have appeared in recent years, and I think I am justified in saying that this examination gives evidence that the relative degrees of success attained by such publications have depended on the interest taken by all connected with the management of the companies producing them, from the highest officers down, in making them dignified, interesting and typographically attractive.

Every publication, whether it is a company magazine or a daily newspaper, develops a personality. This personality usually becomes that of the persons who produce it and reflects their attitude toward it. The publication is the child of their brains and will be characterized by regard or disregard for truth, by fairness or unfairness, by courage or timidity, by good taste or bad taste, according to the controlling characteristics of those who produce it. It will also reflect the extent of their interest in it when it is once born. If it becomes an untidy child, if it cheapens itself by poor English, vulgarity or other evidences of bad taste, this will mean either that its producers are similarly disposed, or else that they care little about it and have abandoned its bringing up to some person or persons who reflect these characteristics.

If I am correct in the foregoing analogy, it is evident that no pains should be spared in producing the best possible type of company publication, for whatever influence it may exert must necessarily be for the development in its readers of the qualities which it thus embodies.

However, to return to our analogy, a family does not cease to be respectable if, through limitations of income, some of its members are called upon to earn money. Plainly the propriety of such a situation depends upon the character of the work done. The head of a household who would allow his children to perform manual labor beyond their strength, or who would allow his neighbors to give them employment in nominal tasks in which they could render no real service, would obviously increase the family income at a sacrifice of self-respect. No one, however, would criticise a boy who performed suitable work, giving fair value for what he earned, either for the purpose of helping out the pocketbook of a family in straitened circumstances or for the purpose of securing spending money over and above what his father could allow him.

The situation is the same with company publications. While the feeling of pride which should be taken in the attractiveness of a publication would naturally disincline a company, that could afford to produce one without advertising, to enter the advertising field, nevertheless I see no objection, involving manners or morals, to the acceptance of proper advertising where this is necessary in order that the publication may be produced, or where it affords the additional income necessary to make the publication thoroughly attractive. Any publication which circulates among several hundred or several thousand employees, in a given city or in various cities which may be centers of industry has, of course, a definite value for certain classes of advertisements. A publication whose circulation is confined to one city only ought to be a very desirable medium for local stores, theaters and all other classes of strictly home advertisers, because if its standards of excellence justifies continued existence, it is bound to be read from cover to cover by its clientele. This sort of reading creates an element of advertising value quite distinct from the size of the circulation and enables certain well-known periodicals with very limited circulation to command the highest rates paid by advertisers in their respective fields.

A publication issued in several different industrial centers where any large company may have plants ought in any event to have certain pages devoted to local news in each plant which would, in the interest of economy, make it desirable to have separate editions. Each such edition, however, could develop its own advertising along local lines, if for any of the reasons indicated above it is necessary to carry advertising.

I do not think it necessary to characterize the impression which would be made on any intelligent person by a company publication which solicited or accepted advertisements from concerns from which it was purchasing supplies or to which it sold its product. If such supplies were required by its employees the company would do better to arrange to obtain them on the lowest possible terms through its own purchasing machinery, which would not require advertising on the part of the dealers. If its own product is one which its employees have occasion to purchase, then the company had better sell to them direct on the most reasonable basis possible.

I do not recall any instances of company publications that have come to my attention which have offended the proprieties in this way, and I add this to my discussion only that it may cover fully the conditions to which it is addressed. HARRY A. BULLOCK,
Secretary.

Spacing of Subway Stations

Massachusetts Commission Points Out That Interests of Greatest Number of People Must Be Considered

IN a hearing held recently by the Massachusetts Public Service Commission on a petition for another subway station in Cambridge, brought by some citizens of that city, the commission discusses the general subject of the proper spacing of stations and the principles which should govern. It said that it would consider this question on its merits without admitting the power of the commission to compel the company to construct a station at the point suggested, if that should prove desirable.

The proposed location is about half-way between two existing stations which are about a mile apart. The petitioners pointed out that on other subways and rapid transit lines, both in Boston and other cities, notably New York, the stations are usually located at intervals of about a half mile, but the commission declares that the conditions affecting station location in the business districts of Boston are so different from those which exist in the suburban districts served by the Cambridge subway as not to be properly comparable. In New York, the commission says, the conditions are also so different as to make a comparison of even less value, as local and express service is conducted in the same subway, and the average distance between the express stops from Brooklyn Bridge north is about 1.66 miles.

The petitioners further stated that the installation of the new station would largely increase property values in the vicinity and prove of great economic value to the city, but the commission held that for it to stimulate artificially real estate development in Cambridge at the expense of similar development in other communities would be an arbitrary and unwarranted exercise of authority. It also pointed out that the saving in time to those who would use such a station would be more than overbalanced by the loss of time by others living farther out who would be delayed by the station stop. the company had testified it would cost $60,646 a year to operate the station, and its installation would be an entering wedge which would tend to decrease the value of the subway as a rapid transit line serving more distant suburbs as well as Cambridge. The petition was, therefore, dismissed.

Canadian Compulsory Investigation Act

Adoption of Principle in This Country Would Grievously Disappoint Even Its Most Ardent Advocates

IN view of the present administrative program for adopting in this country the principle of the Canadian compulsory investigation act, Ralph M. Easley, chairman executive council National Civic Federation, New York, has issued a statement regarding what he deems to be the unsuccessful workings of the Canadian act and the impropriety and uselessness of passing a similar act for the United States. This act was described in the ELECTRIC RAILWAY JOURNAL of Nov. 25, 1916, page 1107. According to Mr. Easley the official reports of the Board of Conciliation to the Labor Department of Canada on the operation of the act from its passage in 1907 to 1916 furnish enough information to dissipate all belief that an industrial Utopia has been developed in Canada.

In the whole nine years the Canadian act dealt with disputes involving only 146,000 employees, and 32,000 of them, or nearly 22 per cent, struck in spite of the award, and in many cases in spite of the law itself before making an application for an investigation. Nothing in the record shows that any attempt was made to inflict the penalties of the law by fining them or sending them to jail. The Canadian act, it is asserted, was not intended to prohibit strikes and it does not prevent them. It is intended only to delay them until after a board has heard both sides of the issue and made a public recommendation, after which either side or both sides, as has happened in Canada again and again, can go ahead and fight it out.

Mr. Easley believes that the adoption of the principle of the Canadian act in this country would not only grievously disappoint the hopes of its advocates, but would tend to make of wage-earners here a horde of lawbreakers. The issue cannot be met by any form of compulsory legislation. Some sort of a mediation board, named by the President and mutually agreed upon by the railroad managers and the brotherhood leaders, under federal supervision, would help the present railroad situation. It would not absolutely prevent a recurrence of the crucial situation of last autumn, but in Mr. Easley's opinion there is no scheme which would be an absolute preventive.

Short and Up-to-Date Articles on

EQUIPMENT AND ITS MAINTENANCE

Remodeling Motors on Third Avenue Railway System—Prolonging Life of Rails in Connecticut—Protecting Roadbed on Water-Retaining Soils on B. R. T. System—Automatic Car and Air Coupler—Spring Type Post Casing for Car Windows—Contact Signal for Cleveland & Eastern Traction Company

(Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.)

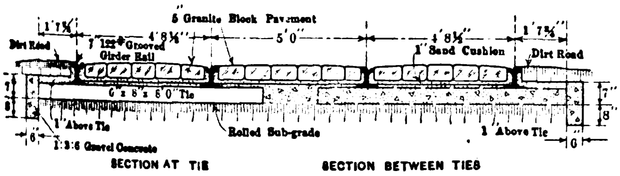
Concrete Baffle Walls in Protection of Roadbed for Water-Retaining Soils

The Plan of Keeping the Water Out Rather Than Draining It Away Was Preferred in the Case Cited

BY R. C. CRAM
Assistant Engineer Way & Structure Department, Brooklyn Rapid Transit System

During an investigation of soil conditions precedent to the construction of the Eighth Avenue extension from Thirty-ninth Street to Bay Ridge Avenue, Brooklyn, it was found that a soil of a character likely to retain considerable water would have to serve as the roadbed for the new tracks. A rather unusual condition was thus presented, as most of the soils found in Brooklyn are gravel and sand, or sandy loam, retaining little water, and these have been found generally suitable for sub-grade foundation without resort to special drainage or the use of concrete platforms or ballast under the ties. The necessity of some method of drainage therefore became evident.

The need for keeping water-retaining subsoil dry was recognized, particularly as no protecting pavement was to be installed in the adjacent roadways which would conduct the surface water away from tracks, but instead of installing a subsoil drainage system it was decided to construct small concrete baffle walls at the outer edges of the concrete base necessary for the granite track pavement. They were constructed as a part of the paving base and the small trenches required to form the walls were made in the soil shortly before the installation of the concrete so as to avoid the necessity for using the usual forms.



CONCRETE BAFFLE WALLS FOR PROTECTION OF SUB-GRADE IN HEAVY SOIL

A glance at the accompanying cross-section will show that the adjacent roadway surface must become thoroughly saturated with water to a depth of over 21 in. before the moisture can pass to the subsoil directly under the tracks. It is believed that it is practically impossible for this to occur and that the subsoil will be kept dry. As dry clay soils of the character found will sustain any load which can be placed on it by means of street railway tracks, the tracks should remain in good surface until the city can pave the adjacent roadway, which may not be done for a period of several years.

A Large Job of Motor Remodeling

An Eastern Railway System Has Been Able to Reduce Maintenance Costs on Old Motors to a Reasonable Value

BY R. H. PARSONS
Electrical Foreman

When the present management of the Third Avenue System of New York took charge about ten years ago the road was equipped with some 600 Westinghouse No. 56 motors. These motors had previously been a source of continual trouble, especially on account of hot bearings. Flashovers and grounded armatures, fields and brushholders were also common. At this time the motors were overhauled and the car wiring repaired. Whereas grease had been used as a lubricant previously oil lubrication was tried. Men were stationed at the ends of the line to oil on each trip, and the motors were also oiled nightly.

The motors then gave fairly satisfactory service until about a year later, when they were placed on fast runs. Here they again developed hot bearings. An attempt was then made to convert them from the split-frame type to the box type by electric welding, using frameheads of modern motors. This was very successful, except that the cost was excessive, about $75 per motor. Finally the old bearings were rebuilt along modern lines, as described below, and this completely remedied the trouble.

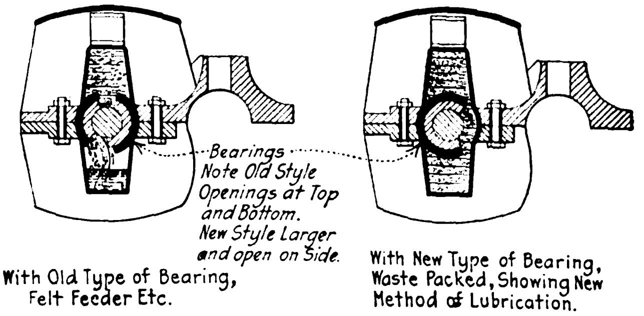
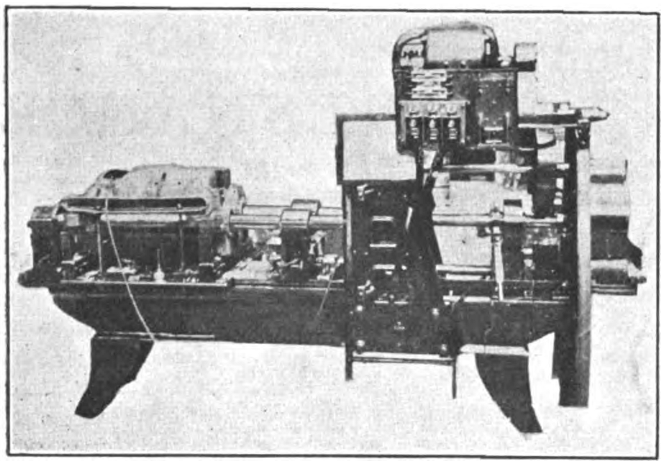

Bearings
Note Old Style Openings at Top and Bottom.
New Style Larger and open on Side.
With Old Type of Bearing, Felt Feeder Etc.
With New Type of Bearing, Waste Packed, Showing New Method of Lubrication.

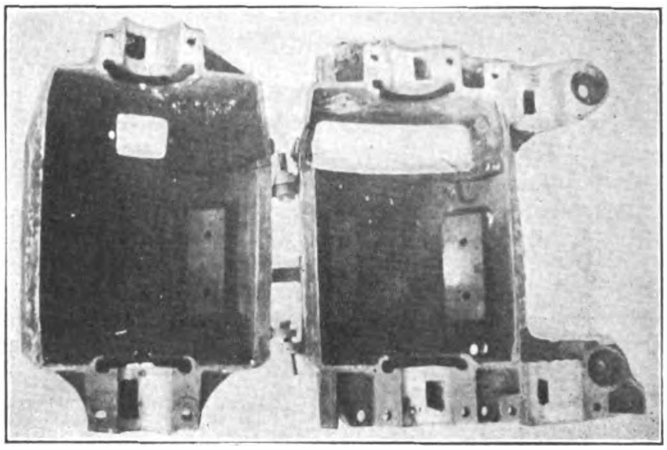
DIAGRAM SHOWING OLD BEARING BEFORE AND AFTER REBUILDING

In the old bearings lubrication was accomplished by means of a felt feeder, which conducted oil from the bottom of the bearing shell onto the shaft, as shown in an accompanying diagram. The glazing of this felt, together with the leakage of oil, was the cause of poor lubrication. In the new style of bearing lubrication is effected by the use of a roll of oily waste which is packed above and below the bearing, passing around the shaft, as shown in a second diagram.

In changing the bearings the first operation was to burn out the old bridging through which the felt feeder was led. A view of the shells with this piece burned out is given in an illustration on page 80. Then a



OLD PLANER USED FOR BORING BEARINGS ON REBUILT MOTORS



VIEW OF FRAME SHOWING REBORED BEARINGS

curved piece of ½-in. steel was electrically welded in place of the old bridging, as shown. This piece instead of having a hole in its center had the hole on the end, and in the upper shell a hole was left in such a position as to fit directly over this lower hole. The large bearing which fits over the wheel shaft was also built up where it had worn. Both bearings were then rebored to their original dimensions, as shown in another illustration.

For reboring, a discarded planer was pressed into service. The motor was fastened to supports which rested on the sliding bed of the planer. Both bearings were bored at the same time by two boring bars, which were geared to a motor on top of the planer. These bars were held securely and guided correctly by two heavy pillar blocks which were doweled and bolted to the frame of the planer.

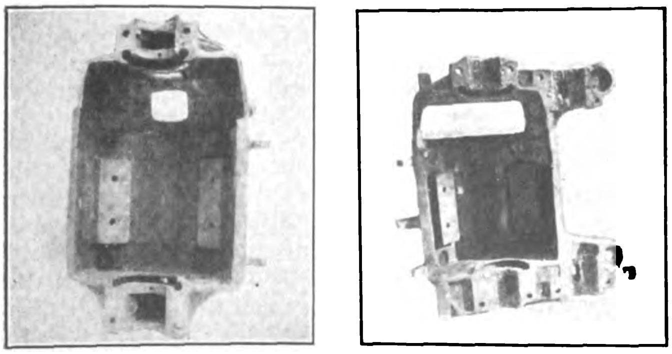
Cast-steel bearings were used in the remodeled motors on account of their long life and the ease with which they could be tinned to keep the babbitt tight. New babbitt blocks were put in, the axle lugs were reinforced and the covers were fitted with modern fastenings. The cost of the whole operation is shown below:

Welding	$6
Boring	5
Reassembling	6
Material, bearings, etc	8
Total	$25

While this work was being done, the fields and armatures were tested and repaired. The armatures were rebanded and the commutators were tightened and slotted.

The advantages derived from this change are apparent in the following records: One car was run 280 miles per day for four days and then brought in for inspection and oiling, using 1 gill of oil for each box. The car continued in this service until it had made a mileage of 45,000, and then, for reasons other than motor trouble, it was put in lighter service. It remained in this service for 15,000 additional miles, after which the motors were still in good condition.

On another division, where the cost of lubrication had been high, after fifty out of sixty-five cars had been equipped with the remodeled motors, the cost was reduced exactly one-half. The remodeled motors are now put into the same service and given the same attention as the modern motors. The bearings do not have the life of modern ones, but where the old bearings needed overhauling after 10,000 miles, the remodeled bearings easily make 50,000 miles with oiling at regular inspection periods instead of daily.



VIEWS OF FRAME AFTER OLD BEARINGS WERE CUT AWAY AND AFTER NEW PIECES WERE WELDED IN PLACE

Prolonging the Life of Old Rail*

Experience of Connecticut Company Shows that Rail Need Not Always Be Relaid When Permanent Paving Is Installed

BY M. E. STARK

Superintendent of Track Connecticut Company, Bridgeport, Conn.

The Connecticut Company has been called upon by city and state highway officials to pave many miles of its track with so-called permanent pavement. In complying with these requests it was at first considered necessary to renew the rails which in many cases had not reached a condition where renewal would be considered necessary under ordinary conditions. It was possible in many cases, however, to prolong the life of the old rail by the use of grinding machines, special joints and welding equipment. Brief descriptions follow of methods employed in typical jobs where the track was rebuilt at the time the pavement was constructed. Figures are given to show the saving that has resulted.

Job A—The track construction on this job was 7-in., 70-lb., T-rail in 30-ft. lengths with ordinary joints. The joints were badly hammered, and corrugations had started in many places. The general surface and alignment of the track were also very poor. In rebuilding the track the joints were repaired with welding and grinding machines, Abbott joint-plates were placed under every joint, iron shims were placed under the rail on every tie and the track was paved with Hassam pavement. This job covered about 8000 ft. of double track, and by leaving the old rail in the new pavement a saving of the expenditure of nearly $20,000 was made.

Job B—This section comprised 6678 ft. of double track and 425 ft. of single track. The rail, which was 7-in., 70-lb. section was electrically welded. New ties were installed throughout, new rails were cut in where some of the welded joints had broken down and some joints that were badly cupped were built up with the aid of the Indianapolis welding machine. The excess welding steel was ground down with the Seymour rotary grinder and finished with the reciprocating grinder, and a few places where corrugations had started were smoothed up. The track was then paved with Hassam pavement. All of the labor for track work on this line, including the preparing of the sub-grade before paving, cost 67 cents per foot of single track. The figures show that on this job alone by leaving the old rail in the new pavement a saving in the expenditure of about $16,575 was made.

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*Abstract of paper read at American Electric Railway Association Company Section Meeting, Dec. 14, 1916.

Job C—This track was laid with 4¼-in. second-hand steam road rail in 30-ft. lengths, weighing about 50 lb. per yard. About half the track was located on the side and half in the center of the street. New ties, new joint plates and Abbott joints were installed and the track was back-filled with gravel. The length of single track repaired on this job was 4500 ft. and a saving in the expenditure of $3,010 was made. On a similar section comprising 3520 ft. of single track, a large portion of the old rail was left in and by prolonging the life of the old rail a saving of the expenditure of $6,325 was made.

Job D—On this job the old 7-in., 70-lb., T-rail was left in, being given the same treatment as outlined above. This covered a distance of 400 ft. of double track, the saving in this case being about $1,000.

On another job involving two tracks, one of which was in good condition, striking results were obtained. The south-bound track was of 7-in., 70-lb., T-rail somewhat cupped at the joints and with slight corrugations in places. The joints were not electrically welded. The north-bound track was of 9-in. girder rail worn beyond redemption, and this was replaced with 7-in., 95-lb., T-rail with continuous joints. When the work of putting the south-bound track in repair so as to save the old rail was under way the company put the Indianapolis welder at work and filled up all the cups at the joints, ground off the excess steel with the Seymour grinder and polished the joints down with the reciprocating grinder. All corrugations and rough places were smoothed off and now that the job is completed very few people riding over this track could say which of the two tracks rides the smoother.

It was the rule on all of these jobs that cars should not pass over the track being paved until the last section of pavement laid had been in place at least twenty-four hours, but occasionally it was necessary to let the cars run over small stretches of the track, while the pavement was being installed. In all of the jobs mentioned a good riding track has been obtained, the rail of which is embedded in a solid mass of concrete which extends 5 in. below the base of the rail. It is believed that with minor repairs with the grinding and welding machines the track will give entire satisfaction for many years to come.

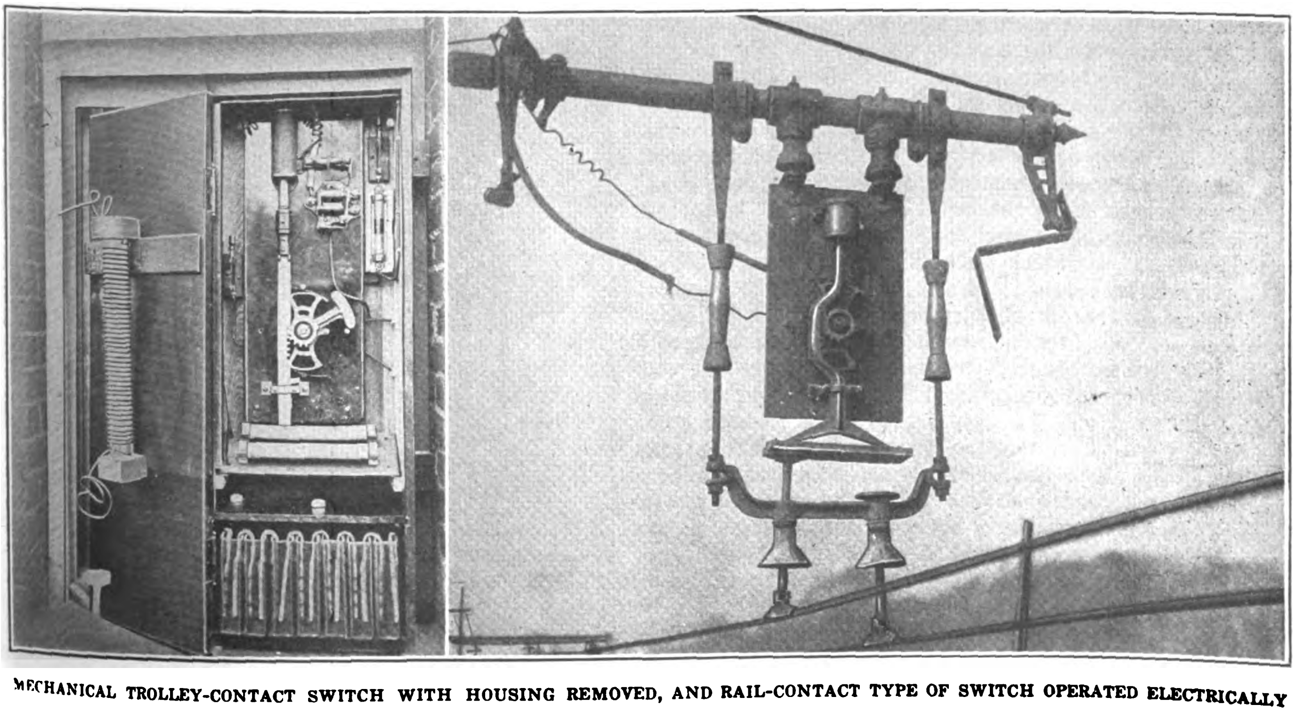
New Type of Contact Signal

A Simple Hand or Automatic Signal Operating Satisfactorily on Cleveland & Eastern

A new design of block and crossing signal has been in practical operation on the lines of the Cleveland & Eastern Traction Company for more than two years. Its construction and operation are very simple, and, therefore, no skilled workmen are required to keep it in working condition. It may be operated either from track or from trolley, a two-way switch that forms the most important element being operable either electrically by a solenoid or by mechanical pressure from the trolley poles of passing cars.

The apparatus, when operated from a rail contact for block signal purposes, consists of a switch mounted on a line pole at each end of the block, a circuit of lights connected in series between the two switches and two 30-ft. insulated sections in one rail. The circuit through the relay is completed through the other rail. The switch mechanism consists of the above mentioned relay, a solenoid which operates the switch that controls the 500-volt light circuit, and a seven-cell storage battery. This battery floats on the line continually and supplies the energy to the solenoid.

The operation of the switch is as follows: The block is protected at each end by a lantern with red lenses,



MECHANICAL TROLLEY-CONTACT SWITCH WITH HOUSING REMOVED, AND RAIL-CONTACT TYPE OF SWITCH OPERATED ELECTRICALLY and if this lantern is illumined, indicating danger, the car is compelled to remain beyond the block until the lantern is extinguished, indicating that the block is clear.

When the signal is not set at danger, the car travels beyond the first lantern to the insulated rail, at which point the motorman receives a come-on signal by a white light. He then proceeds for about one-half the length of the block, at which point a double caution light is seen. He then proceeds through the block, and at the far end the car makes contact with another insulated length of rail, clearing all of the signals in this block for the next car or train.

The above-mentioned middle or caution light is for any irregularities, such as if another car had entered the block through the carelessness of the operator in not having observed the signal. In this case, the opposing car would immediately note that this signal was dark and would thereupon stop at once, flagging through the balance of the block.

In the operation of the same apparatus as a crossing signal, it is necessary only to use one switch with a wire running to each insulated rail. In this combination is used a set of five lights in conjunction with a bell. One each of this group of lights is located approximately 700 ft. on either side of the crossing, the remaining cluster of three lights being located at the crossing to serve as a visual indication.

The light circuit and the bell circuit are separate, so that neither one is dependent upon the other for operation. The lights located adjacent to the insulated rail on either side of the crossing are intended for the guidance of the trainmen, who are thus informed that protection is being given at the crossing by lights. Trainmen are not permitted to proceed until they get this signal, and when they are unable to get it, conductors are instructed to flag the car over the crossing. This type of signal prevents two cars from entering the crossing simultaneously—a very dangerous practice that does not give the general public sufficient time in many cases to cross between cars.

With both the block signal and the crossing signal there may be used, instead of the insulated rails, a trolley-operated switch that is entirely mechanical in operation, electric current being used only for the light signals and for the bell circuit. This contact switch is operated by the upward pressure of the trolley pole, and on a double trolley line the operation of the switch is not interfered with in any way by the trainman placing the trolley wheel on the trolley wire of either direction. The switch is used in practically the same way as the previously mentioned insulated rail sections for signal purposes, one switch being mounted on a separate pole at either end of the block.

For the crossing signal it is necessary to use one trolley contactor switch at each side of the crossing. The current to operate the bell and to illuminate the lights is taken from the trolley, the bell and lights being in series. In this case the motorman is not permitted to proceed unless he gets his proper signals through the lights, indicating that the crossing is protected by both bell and lights, the lights vibrating or giving a flash effect due to the vibration of the bell. Either of the above-described signals, which were originated and patented by Robert D. Beatty, general manager Cleveland & Eastern Traction Company, can be installed at a very nominal cost.

Aluminum wire has been used for more than 50,000 miles of transmission line of which, according to the engineers of the Aluminum Company of America, about 15,000 miles are in the Pacific States.

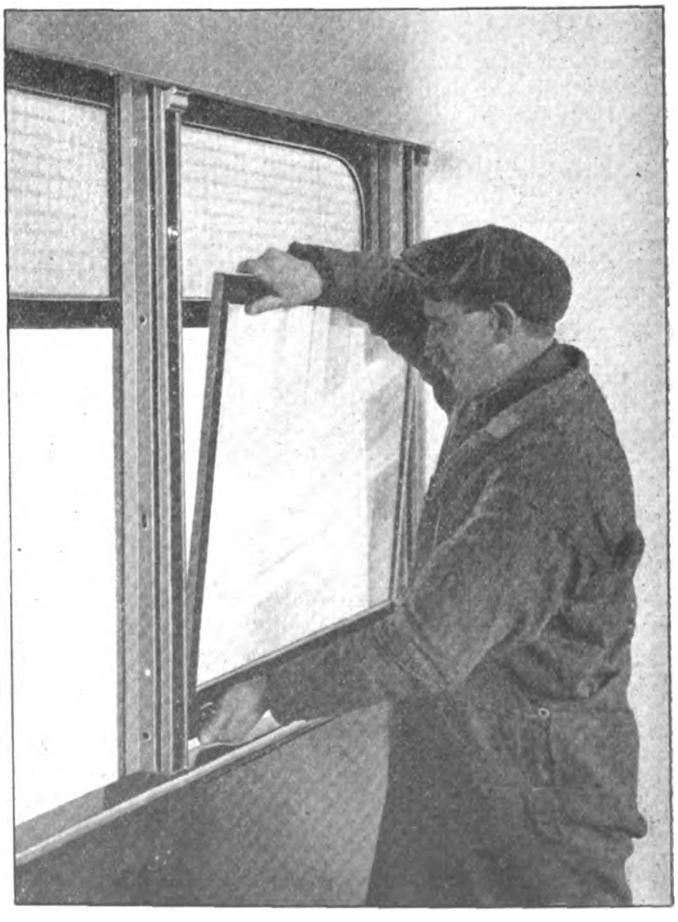
The Spring Type of Post Casing

A Moisture-Proof, Rattle-Proof Device Permitting Ready Removal of Sash

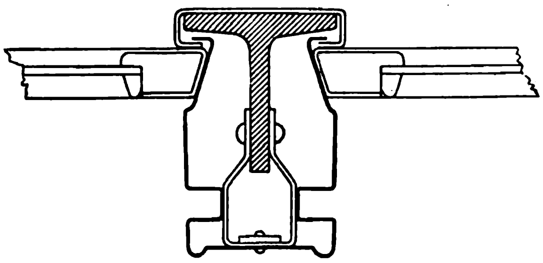
Until very recently the window system of a car built with steel upper framing was customarily made up by attaching to the T-posts grooved wooden runways for sashes and curtains, as well as the wooden pilasters. This method of construction was early discovered to be not thoroughly efficient, because the wood had a tendency to swell when subjected to dampness. The demand for a post that would not be affected by moisture eventually became so strong that the attention of The J. G. Brill Company was turned to the subject of an all-metal post, and the result has been the Brill "renitent" post, whereby there is provided a post casing that has in its favor the advantages of being water-tight, rattle-proof and safe against dropping the sash, and of being easily removed from its runways without the use of tools.

The post-casing, which gets its name from its feature of "offering elastic resistance to pressure," consists of a casing of spring brass attached to the T-post by means of clips fastened to the casing and fitting into stirrups riveted to the post. The feature of ready removal without the use of tools is of tremendous importance. Ordinarily, the removal of a sash from its casing involves careful handling of tools by a mechanic and consequently the loss of some little time. However, with the renitent post the sash may be taken from its casing simply by pulling it out. This means that the operation is one that can be performed by anyone and that does not require the services of a mechanic. However, the sash cannot be removed from its casing as a result of the casual pressure exerted by a passenger in raising or lowering. Also, no wind pressure, no matter how great, can disturb the sash.

Another very great advantage of the renitent post is



REMOVING SASH FROM SPRING-TYPE SASH GUIDER that rattling is absolutely prevented by the elastic pressure that is exerted on the sash stiles by the spring-brass runways. This feature also guarantees the passenger against accident to his hands or arms which may be resting on the window sill and which might be injured by the sash dropping suddenly. If the catches should become unfastened the sash will drop gradually. A very great advantage given to the sash by this check on its dropping is that the sashes cannot be racked or the glass broken by careless handling. The spring brass casing gives a uniformity of pressure which does away absolutely with fitting sashes individually into their runways as must be done with sashes which are constructed to slide in wooden runways. Consequently the sashes are interchangeable from window to window and from car to car, where the windows are similar.



SPRING TYPE OF SASH GUIDE

Still another advantage of the resilient post—and one that, although named last, by no means is the least important—is that the post casing may readily be removed from the T-post, thus making the latter easily accessible if it should be necessary to make inspections or repairs in case of collision. The clip-and-stirrup method of attaching the casing to the post is very effective although it is simple, and it absolutely prevents the casing from becoming loose.

The renitent post is considered to be better than the wooden construction not only because of its many mechanical advantages, of which the most important have been cited, but also because it presents a much better appearance than can be obtained with wood, making a lighter and considerably neater looking post than does the wooden post. This improved appearance is not the result of any sacrifice of strength, the pressed form of the post casing giving it sufficient strength in every direction to prevent it becoming dented or injured except by very heavy blows.

Because of the curving sweep which has to be given the casing, the renitent post system is not adaptable to the Brill semi-convertible type of car. However, the post may be attached to any other type of city or interurban car, and it is readily applied to the double-window post construction that is found in interurban cars built with twin windows. In this twin-post construction the gap between the post on the inside of the car is bridged with a sheet steel cover which is fastened into the curtain groove on the sash side of each of the twin posts. The renitent post is made in a range of sizes covering every width of post.

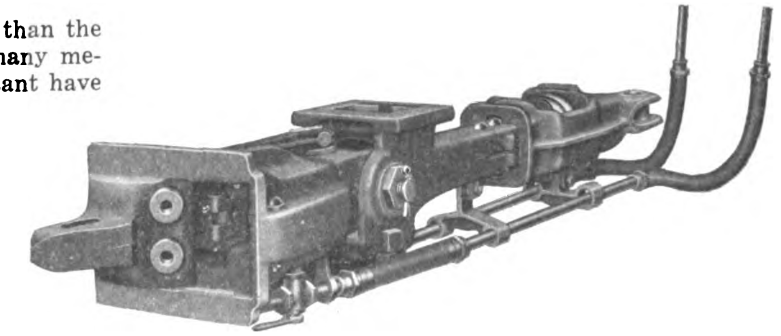
The injurious effects of skidding by electric cars were illustrated by C. V. Wood, shop foreman Newport News, & Hampton Railway, Gas & Electric Company in a paper delivered before the local company section of the American Electric Railway Association. He estimated that in sliding 10 ft. a 30-ton car develops sufficient heat to melt 0.59 lb. of metal per wheel, while a wheel carrying 20,000 lb. with a flat spot 3 in. long strikes the rail with a force of 104,000 lb. when running at 16 m.p.h.

Automatic Car and Air Coupler for City Cars

This Coupler Obviates the Necessity for Men to Stand Between Cars When Coupling

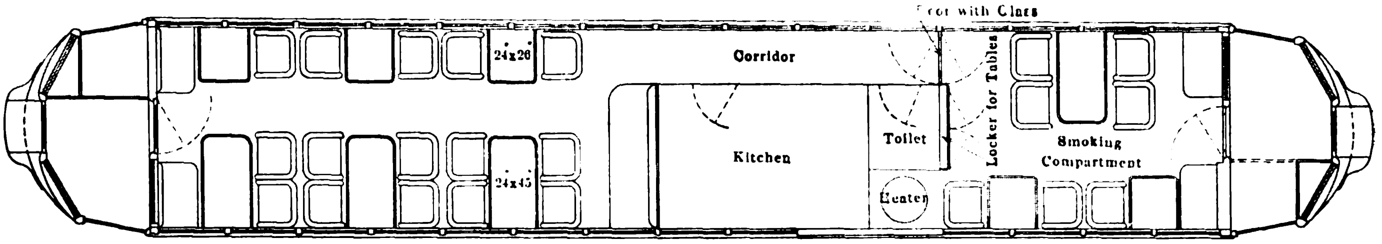
A recent design of automatic car and air couplers brought out by the Van Dorn Coupler Company, Chicago, for city and light interurban service embodies several new features. These couplers are carefully machined to make a perfectly rigid connection when coupled together, the two heads being held in this rigid contact by means of the locking mechanism, and the rigidity at the connection made possible by virtue of the suitable joints behind the heads to provide the necessary vertical and lateral movement. The horizontal movement pivots about the bolt through the inner end of the coupler, while the vertical motion is pivoted at the horizontal bolt just back of the head and unlocking lever. In spite of this exactness of fit, the couplers will properly come together and lock, it is claimed, though they may be 3 in. out of alignment, and they are sufficiently flexible to operate under conditions where the car platforms may assume a difference in level of 10 in.

A lever, located on top of the head where it is readily accessible from either side, lifts up and turns through 45 deg. to unlock the device. When in the normal position this handle lies between two lugs on the head which protect it from breakage by striking the platform or chains, and this horizontal position of the lever gives more clearance for the free working of the coupler. When operating this unlocking device, a special mechanism holds the coupler unlocked after the lever has been turned through 45 deg., the handle going back to the normal position when released. This catch on the locking mechanism is automatically released when the two couplers part, or (if the coupler has been unlocked while not in connection with another car) when they come together, so that there is no necessity for a man to stand between the cars when coupling or uncoupling. In other words, the coupler is always ready to couple-up without attention being given to the locking mechanism. The lock is complete in each coupler and thus makes a double lock when two are coupled together, and as long as either one is locked the connection is held in the same rigid condition. All obstruction to the free operation of the locking lever is removed by placing the two air pipes on the underside of the coupler with the valves just behind the face plate where they are conveniently located to be reached by the trainman, both from either side. The mechanism is so designed that any wear in any part of the mechanism is automatically taken up as it develops so that the connection remains as rigid as ever throughout the life of the coupler.



AUTOMATIC CAR AND AIR COUPLER FOR CITY CARS

The coupler heads are held in normal coupling position by a flexible supporting device underneath the



FULL DINING CAR ARRANGEMENT OF THE CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD COMBINATION PARLOR AND DINING CAR

drawbar shank, and the whole coupler is supported by means of lugs cast on the top of the shank which engage the carrier sliding on the radial bar. This flexible device supporting the head is adjustable to allow for sagging of platforms, wearing down of wheels, etc.

The Van Dorn patented draft gear especially adapted to city service is utilized with the new coupler. The slot seen in the coupling nose is for use when coupling with other style Van Dorn couplers. The length of the new couplers is 4 ft. 6 in. The pronounced rigidity of connection secured at the coupler heads of course increases the life of the couplers and insures against air leakage.

Over 200 of these couplers are in use on the cars of the Pittsburgh Railway, where the hilly conditions place rather exacting strains on coupling devices. Some 520 more of them are being made for this company which has now practically standardized on this type of equipment.

Combination Dining and Parlor Cars for Chicago, North Shore & Milwaukee Railroad

With the completion of three new all-steel cars now under construction at the Jewett Car Company's plant, the Chicago, North Shore & Milwaukee Railroad will begin a dining and parlor-car service between Chicago and Milwaukee. This is expected to be in operation soon after the first of February and its inauguration will be another link in the series of improvements and refinement of the service, roadbed and equipment of this road since it came under the control of Britton I. Budd. These new cars are to be of the standard design of the North Shore road and equipped with four motors and multiple-unit control so that they may be operated as part of a train or individually if engaged for a private party. The interior arrangement of chairs and tables is to be such that the cars may be entirely devoted to dining service or entirely to parlor-car service, or partly to both at the same time. The chairs are so dimensioned as to fit into either arrangement without the necessity to store any away. These two arrangements of the chairs are shown in the accompanying illustrations. There will be nine tables and twenty-two chairs, and stationary seats at the bulkheads for twelve passengers, making the total seating or dining capacity thirty-four persons. The kitchen is to be fully equipped to serve, as Mr. Budd says, "not elaborate meals, but everything good and at popular prices."

In the rearrangement from parlor car to diner, there is one chair extra in the smoking compartment which makes up the one short in the main compartment. Changing back, the tables all fold up and are stored in a locker at the front kitchen bulkhead. Thus after a meal is served the passengers may be made comfortable by putting the tables away and rearranging the chairs. There will probably be call for this equipment as special chartered cars for parties from the North Shore towns into Milwaukee and into Chicago, especially the latter with a station of the elevated lines in Chicago at the very door of the Auditorium theater, where all grand opera and other important social gatherings are held. The interior of the cars will be mahogany finish and the chairs solid mahogany with leather upholstery giving, with the center and side post lighting, a very attractive appearance.

An Easily-Made Phase-Rotation Meter

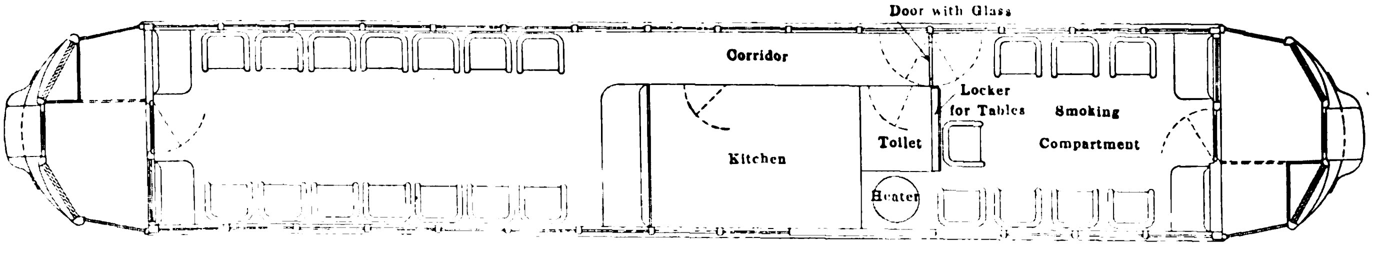
When a three-phase generator is to be connected to a live system, its phase rotation must be in the same direction as that of the system. For determining this phase rotation an easily-made instrument was devised by E. P. Peck, Georgia Railway & Power Company, Atlanta, Ga.

The instrument consists essentially of a watt-hour meter disk mounted in its bearings directly over three symmetrically spaced telephone bell coils. When this instrument is connected to a three-phase system the disk revolves in one direction or the other. The instrument is then transferred to the generator cable and if the disk revolves in the same direction as before the phase rotations are proved to be the same, and vice versa.

Oil-Insulated Cable Joints

A method of impregnating cable joints with oil has been developed by the Metropolitan Engineering Company, New York City. After a joint is made, a special sleeve having an opening for filling with oil is put on. For voltages under 16,000 the oil is simply poured through this opening.

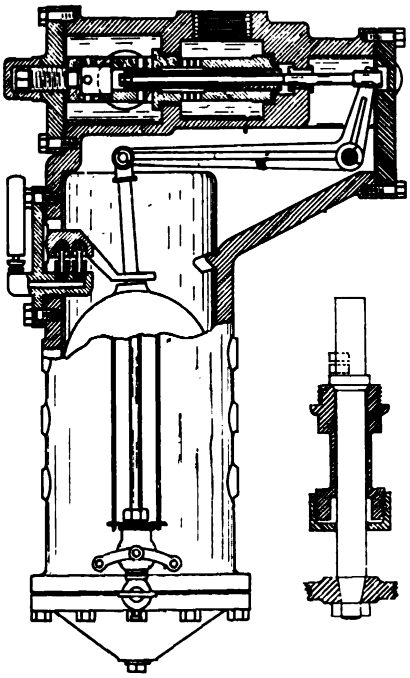
When used on cables for voltages of more than 16,000 a special apparatus is used for producing a vacuum inside the sleeve so that when the oil is poured in it penetrates more completely than if put in under atmospheric pressure. It is claimed that the joints made by these methods operate satisfactorily under the worst conditions.



PARLOR CAR ARRANGEMENT OF THE CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD COMBINATION PARLOR AND DINING CAR

Continuous Feed-Water Regulator

A regulator for providing a continuous flow of feed water proportionate to the evaporation has been developed by the Ray Manufacturing Company, Louisville. Essentially it consists of a perfectly balanced valve operated by a float. The feed water is admitted to the valve at its center and is discharged at one end in a continuous flow controlled by the position of the float.

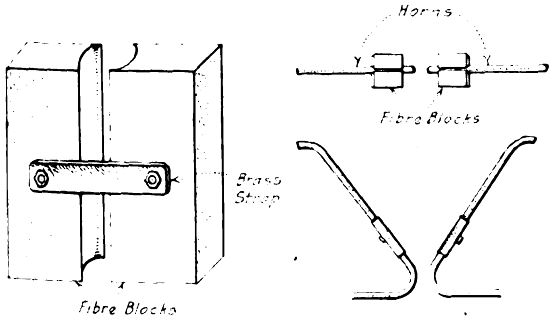


CONTINUOUS FEED-WATER REGULATOR

A high and low-water alarm whistle is operated by two contact points on the float rod. The whistle lever is counter-balanced to hold the whistle valve closed when pressure is off the boiler.

Preventing Birds from Grounding Lines

Small birds have in the past been a source of considerable trouble on the lines of the Georgia Railway & Power Company. By alighting on the horn gaps of the lightning arresters they grounded the lines through their bodies and caused the automatic switches to trip out in a number of cases. To prevent such disturbances the device illustrated herewith was built under the direction of T. F. Johnson, superintendent of lines.



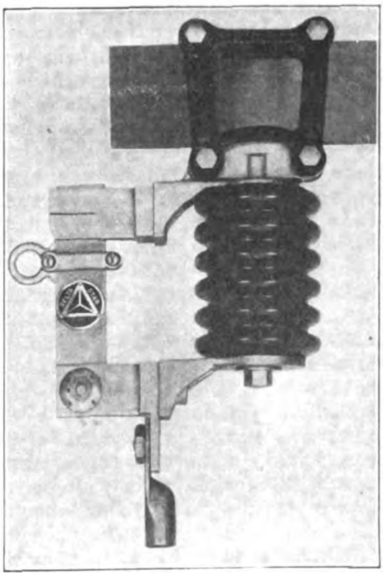
DEVICE TO PREVENT BIRDS GROUNDING LINES AT HORN GAPS

The device consists of two ½-in. horn-fiber blocks, 5 in. by 2½ in. each, connected together by a spring-brass strap. The heads of the bolts holding this strap are countersunk and sealing wax is poured over them. The inside edges of the blocks are grooved so as to fit on the horn. By bending back the outer edges of the blocks, the inside edges are forced apart far enough to enable them to slip over the horn. On releasing, the spring strap causes the blocks to clamp firmly on the horn. The device is placed with its bottom edge at the smallest point of the gap and with the strap on the lower side.

The only part of the gap left unprotected is above the blocks where it is so wide that no harm can be done by a bird alighting upon the horn.

Bus-Type Disconnecting Switch

A disconnecting switch which can be installed in very close quarters has been put out by the Delta-Star Electric Company, Chicago, Ill. A clamp which fits directly over the busbar serves to support the switch. Fastened to this clamp is one of the blades of the switch as shown in the accompanying illustration. A corrugated porcelain cylinder securely fastened to the clamp holds at its lower end the hinge blade of the switch. On this end is also mounted a terminal block for connecting a circuit to the bus.



DISCONNECTING SWITCH CLAMPED TO BUSBAR

On account of its compactness this switch is well adapted for installation between a busbar and an oil switch mounted in the same bus structure. When the disconnecting switch is open the oil switch may be examined and repaired without danger. It may also be used to disconnect motor, generator and other circuits from the bus and to separate different sections of a bus.

Temporary Substation Quickly Built After Fire

Quick action in an emergency caused by the burning of a substation enabled the Hudson Valley Railway to resume normal operation just five days after the fire started. The substation was located at Wilton, N. Y., halfway between Glens Falls and Saratoga Springs, which are 20 miles apart. A temporary wooden building was constructed to house the rotary loaned by a neighboring company, the Schenectady Railway, and in the short time named above the station was put into operation and has been running satisfactorily ever since. During construction of the new building regular service was maintained by feeding the line from both ends and running light cars instead of the heavy interurban cars.

News of Electric Railways

Traffic and Transportation
Financial and Corporate Personal Mention Construction News

Another New Jersey Statement

President McCarter of the Public Service Corporation Reviews Recent Increases in Costs

Thomas N. McCarter, president of the Public Service Corporation of New Jersey, Newark, N. J., has issued a statement to the public dealing with a number of problems before the company. Mr. McCarter emphasizes that the corporation is confronted with rising costs in materials and labor, with an income limited by the fixed rates it can charge for transportation, gas, and electricity. He dwelt particularly upon the problems of rising material and labor costs, specifying these recent price changes:

Coal: $4 a ton paid above contract price in open market when contractors failed to make deliveries. Copper: Hard to get at 38 and 40 cents a pound, though selling at 28 cents a year ago, and in the past could be bought for 11 and 12 cents. Manganese steel, for track intersections, curves, and switches: $500 per ton, formerly $100. Other metals and metals used in car building: Increased 100 per cent. General average increase in cost of all railway materials, about 40 per cent. Mr. McCarter said in part:

"There is nothing magical about public utilities which enables them to escape the inexorable laws of trade. Every upward tendency in the price of materials and the price of labor must be met by the public utility just the same as it must be met by the merchant and the manufacturer. But there is this distinction: public-utility rates are fixed, and increases in cost of production must be absorbed by the operating company. The company's loss in this respect has been the consumer's gain. The Public Service Corporation has met extraordinary conditions during the last year and has met them without shifting any of the burdens to its patrons. Might it not be well for the public to ponder what must happen if the price of labor, the cost of materials, and the amount of taxes levied continue to mount year by year."

As the conference of committee members of the Republican majority of the 1917 Legislature has decided to put through a bill taxing gross receipts of New Jersey utility companies 5 per cent, Mr. McCarter's statement of the rising costs of utility corporations is accepted as the beginning of his campaign of protest. Mr. McCarter had frankly said that the corporation would keep representatives at Trenton just so long as legislation inimical to the corporation was introduced there, and just so long as the corporation desired the passage of what he believed to be just and reasonable measures. This course he made plain in a statement to the public republished in full in the ELECTRIC RAILWAY JOURNAL of Dec. 2, page 1171.

Fare Hearing in Milwaukee

Milwaukee Company in Emergency Plea Seeks to Increase Fare to Establish Eight-Hour Day and Wage Advance

The hearing before the Railroad Commission of Wisconsin on the application of the Milwaukee Electric Railway & Light Company and the Milwaukee Light, Heat & Traction Company for a readjustment of fares and hauls to permit the company to earn enough additional revenue to establish the eight-hour basis throughout their organizations and to grant increased wages offsetting the increased cost of living was begun in Milwaukee on Jan. 5 and continued on the morning of Jan. 6. The hearing then went over until Jan. 15 at 10 a. m.

The plea of the companies was presented to the commission recently as an emergency measure. It has nothing to do with the petition for relief dated Nov. 6, 1915, and their commission has limited the scope of the emergency hearing to the single question of permitting the companies to earn enough additional revenue to give their employees the eight-hour basis and higher pay. The companies explained their case to the public through newspaper space, saying that every dollar of the increased revenue for which they were asking, if granted, would be paid to their employees. They estimate the cost of the eight-hour basis at $401,345 yearly and that of the proposed wage increase at $230,946 yearly, or a total increase of $632,791 yearly. In its petition to the commission the companies said:

"Your petitioners are desirous of placing into effect the basis of an eight-hour day throughout their entire organizations.

"To put such eight-hour day into effect and permit your petitioners' trainmen and other employees to receive as large a monthly wage as they now receive will involve an increase of approximately 25 per cent in hourly rate of pay for such trainmen and other employees, or its equivalent.

"Your petitioners also are desirous of making a further increase in wages for their trainmen and other employees in order to meet the present increase in the cost of living.

"Your petitioners are unable to put in force the basis of an eight-hour day for their trainmen and other employees, or to make this increase in wages, because of the inadequacy of your petitioners' earnings.

"The present situation of your petitioners is such as to constitute an emergency requiring relief forthwith, and immediate alteration and amendment of the rates and schedules of your petitioners' railways."

The petitioners have made the following public announcement:

"Every dollar of this increased revenue for which we are now asking if granted is to be paid to our employees.

"Our investors must wait for the relief that is due them until the commission at a later date is ready to consider all of the issue presented in our petition of Nov. 6, 1915."

Increase in Wages in Toronto

The Toronto (Ontario) Railway on Dec. 21 announced an increase in the wages of its men dating back to Nov. 1. The increase applies as follows:

MOTORMEN AND CONDUCTORS

For first year, from 23½ cents an hour to 26 cents.

For second year, from 25½ cents an hour to 28 cents.

For third year and after, from 27½ cents an hour to 30 cents.

SHEDMEN

Foremen, from 27½ cents an hour to 30 cents.

Operating shedmen, from 24½ cents an hour to 27 cents. Men who operate cars and do general shed work.

Shedmen, doing general shed work, but not operating cars, 26 cents an hour.

Car washers, from 23½ cents an hour to 25 cents.

MOTOR AND TRUCK REPAIR MEN

For first year, from 23½ cents an hour to 26 cents.

For second year from 25½ cents an hour to 28 cents.

For third year and after, from 27½ cents an hour to 30 cents.

Employees in other departments who have not had an increase in wages since the agreement was signed will be dealt with upon their merits. In taking this action the company has been influenced solely by the change in living conditions and the additional burdens placed upon the employees as a result of the war.

Aurora, Elgin & Chicago Arbitration

Wage Increases Awarded to City Line Trainmen, Fox River Division Trainmen and Certain Shop Employees

The arbitration proceedings between the employees of the Aurora, Elgin & Chicago Railroad and the company have been completed. The taking of testimony in the case was begun on Sept. 25, 1916. The testimony in full consisted of 3102 pages of typewritten records and 228 exhibits. The board of arbitration points out in its findings that the present day cost of living, based on information obtained generally and locally, and figured on the weights given the items composing the family living budget, by Mr. Mahon, international president of the Amalgamated Association, is 31.9 per cent higher than in 1901. It was also stated that the wages of the employees have increased between 60 per cent to 85 per cent in the same time, and thereby, that the present-day purchasing power of the wages on this road is considerably greater than in 1901.

Bion J. Arnold testified that he had made a valuation of the company's railroad property and found it to be worth in round numbers $11,400,000. He also said that the company would be entitled to earn 7 per cent on this amount, or $798,000, as a fair annual net return for railroad operation. It is not making anywhere near this amount at the present time, nor has it done so for several years.

The testimony showed that in most of its departments the company under its last agreement with the association was paying much higher wages than almost all other similar companies, and higher also than the wages paid to men in other employment in the territory served by it.

The board found that provision should be made for a minimum wage of 25 cents an hour to all power house and shop employees at Aurora, Elgin and Wheaton, employed more than one year by the company and made this award to those who have been receiving less than that amount.

In the transportation department, the award to trainmen was as follows: On the third-rail division, where the wages are fixed by the 1913 agreement at 30, 33 and 36 cents an hour, the testimony showed that nearly all the men are drawing 36 cents an hour and that some of these men earn as high as $1,400 and $1,500 a year, the average being $1,225. The board states that "it seems that they are certainly well paid and receiving all that they should reasonably receive under the facts as shown in this case."

On the Aurora and Elgin city lines and Fox River interurban lines, including the Elgin-Carpentersville, the Elgin-Aurora, and the Aurora-Yorkville interurban lines, the trainmen on regular and extra runs were granted an increase of ½ cent an hour for the first year of the contract, and 1 cent an hour for the second year of the contract, added to the 1913 agreement which was previously as follows:

	First Year	Second Year	Third Year
Aurora-Elgin	30	30	30
Aurora-Yorkville Elgin-Carpentersville	28	28	28
City Lines, Aurora and Elgin..	23½	24½	26½

In its finding, the board states that it is of the opinion that the company should be entitled to earn a net annual return from the operation of its railroad property at the rate of 7 per cent after the payment of reasonable wages to the employees and all other operating expenses. Then it states that if the company makes during the present fiscal year such a net profit in its railway operation on the value of $11,400,000 set by Mr. Arnold, there should then be added to the wages of each of the employees, during the second year of the contract, 1 cent an hour.

Pay at the rate of time and one-half for overtime, Sunday and holiday work was awarded to the night shop men in Aurora and Elgin, to make their rate of pay conform with that prevailing in the other shops of the company. The finding also makes some changes in the agreement as to working conditions. The new contract between the employees and the company is made effective as though dated June 1, 1916, and continues in force for a period of two years thereafter. All wage increases are effective from June 1, 1916, and the accrued increases are accordingly allowed."

New York Commission Reports

Second District Commission Submits Tenth Annual Report to Legislature with Recommendations for Further Legislation

The tenth annual report of the Public Service Commission for the Second District of New York was submitted to the Legislature on the evening of Jan. 10. The report calls the attention of the Legislature to three changes in the powers of the commission effected by court decisions during the year which have had a far-reaching effect and which may require important legislative action. These changes include the decision of the Court of Appeals in the Ulster & Delaware Railroad's appeal, where it was held that the commission had power upon proper showing to permit an increase of the mileage book rate above 2 cents a mile, notwithstanding the "mileage book law" which restricted it to that figure. The court held that the public service commissions law of 1907 superseded all previous enactments and gave the commissions absolute power over rates.

The Court of Appeals decision in the New York and Queens gas case is also called to the attention of the Legislature. The court there held that the Appellate Division has not the power to review the reasonableness of a decision of the commissions, but only to annul the order for some violation by the commission of a rule of law. These two decisions, it is believed, give the commissions the almost absolute power over rates and service which was contemplated when the law was passed in 1907.

The courts have defined the powers of the commission under the jitney bus law and the commission has established the policy that no jitneys will be permitted to compete with existing street railways where the latter are giving reasonable service. As a result only two jitney lines are now operating exclusively within city limits in New York State outside of Greater New York. Wherever suburban lines come into cities, the certificates of convenience and necessity of the jitneys have been so drawn that they cannot carry local city passengers in competition with trolleys.

The commission calls attention to the fact that the bus lines operating outside of cities are now not subject to any control as to service, safety, rates, or their competition with existing carriers and recommends that the existing law be modified so that bus lines will not be required to file the elaborate schedule and reports required of other common carriers.

An important request for the extension of the power of the commission over the physical surroundings of grade crossings is made. In a number of cases where the expense of eliminating a grade crossing would not be warranted by the greater safety to be attained, the commission has found that the removal of brush or other obstructions to vision would make the crossing as safe as reason would require. The commission asks that it be given power to order these changes in the surroundings of grade crossings and the power to apportion the expense thereof as is now done with eliminations.

An analogous extension of power over the grade crossings of electric railways will also be asked, but as this will probably be coupled with recommendations to be contained in the report of the conference which the commission has been holding for a year with representatives of electric railways and automobile clubs throughout the State with regard to greater safety in all respects at electric railway grade crossings, specific recommendations will not be made until this conference completes its report in the near future.

The commission recommends minor changes in the law to facilitate its accounting supervision of corporations under its jurisdiction.

The report contains its usual array of statistics of interest chiefly to the operators of the utilities concerned. The accident figures show no considerable change, despite the great increase of business during the year.

The commission asks for appropriations this year of $421,000 as against $404,000 last year, and urges in the strongest terms that the Legislature repeat its appropriation for grade-crossing elimination work, as many important eliminations are now pending for which no funds are available.

United Railroads Increases Wages

First-Year Men Get 2 Cents an Hour Advance and Others 1 Cent

Just before the New Year there was posted in the carhouses of the United Railroads, San Francisco, Cal., an announcement of an increase in the wages of the platform men from President Lilienthal, in which he said: "The year 1916 has been a very hard year for the company. There has been a further very large decrease in the earnings, owing to the competition of jitneys, other automobiles and municipal lines—the cost of all materials has been largely increased—the presence of the jitney has greatly increased the number of accidents, and a reorganization of the company's finances has not yet been accomplished. But the management realizes that the cost of living has been constantly growing higher, and that it has been becoming more difficult to make ends meet, and I have been impatient to show you some practical appreciation of the admirable manner in which you are performing your duties and of the support and loyalty that you have manifested to the company. So that, while we are not even paying the interest on our bonds, I have approved an increase of wages recommended by Mr. von Phul, which he will publish in a separate bulletin."

In conjunction with this there appeared a notice from William von Phul, vice-president and general manager, to the effect that "beginning Jan. 1, 1917, the wages of platform men who have served one year or less will be increased 2 cents an hour. Wages of those who have served one year or more will be increased 1 cent an hour." The new scale of wages on this basis is as follows:

During the first six months	27 cents an hour
During the second six months	28 cents an hour
During the second year	29 cents an hour
During the third year	30 cents an hour
During the fourth year	31 cents an hour
During the fifth year	32 cents an hour
During the sixth year	33 cents an hour
During the seventh year	34 cents an hour
During the eighth year	35 cents an hour
During the ninth year and thereafter	36 cents an hour

Philadelphia Retains Ford, Bacon & Davis

Mayor Smith of Philadelphia, Pa., has retained Ford, Bacon & Davis, New York, N. Y., as expert advisers to the city, in connection with the proposed agreement between the Philadelphia Rapid Transit Company and the city regarding the contemplated high-speed elevated and subway lines. The Mayor has declared that he will see that all the conferences and meetings at which the proposed agreement is discussed are open, in order that the newspapers may keep the people informed of every move made in the matter. Ford, Bacon & Davis were retained some time ago by the then Director of Public Transit, A. Merritt Taylor, to consult with him on the so-called Taylor plan. William S. Twining was designated at that time as the expert for Ford, Bacon & Davis, and he subsequently succeeded Mr. Taylor as director.

St. Louis Settlement Conferences Postponed

Conferences with the officials of the United Railways, St. Louis, Mo., to discuss a settlement of the mill tax and franchise problems have been halted by Chairman Gregory of the public utilities committee of the Board of Aldermen. Mr. Gregory is quoted as stating that no further conferences with United Railways officials will be held until all free bridge and the Terminal Ranken tract legislation is disposed of. From present indications he is said to doubt whether these bills will be reported out in time to finish the United Railways compromise problem before the close of the aldermanic session. He recently called a meeting of the general conference committee to discuss the United Railways compromise, but called off the meeting when newspapers printed the terms of a tentative proposition Mr. Gregory's committee proposed to make to the railway in response to the company's compromise offer.

Contractors' Papers Purchased

McGraw Publishing Company Buys Two Chicago Contracting Papers

The McGraw Publishing Company, Inc., New York, N. Y., publisher of the ELECTRIC RAILWAY JOURNAL, has purchased *The Contractor* and *Contractor's Review*, both of Chicago, and will consolidate them under the name of *The Contractor*. The new paper will continue to devote itself to the interests of the contractor engaged chiefly in local work and of the contractors' superintendent. It will be published at Chicago every other week, and the subscription price will be $1 a year. The editorial and advertising policies will be directed by the staff of the *Engineering Record* with E. J. Mehren, editor of the *Engineering Record*, as editorial director and C. S. Hill as acting editor. Mr. Hill has been the editor of *Contractor's Review* and was formerly managing editor of *Engineering and Contracting* and associate editor of *Engineering News*. The other papers in addition to those mentioned which are owned by the McGraw Publishing Company, Inc., are the *Electrical World*, *Electrical Merchandising* and *Metallurgical and Chemical Engineering*.

Fire Ravages Pottsville Plant

Twenty cars, mostly of the open and service types, were burned and railway, lighting and power service was temporarily suspended by a fire on the evening of Jan. 6 which destroyed the carhouse and part of the roof of the power house of the Eastern Pennsylvania Railways at Palo Alto, Pa. According to an account of the fire related by J. H. Pardee, president of the company, to a representative of the ELECTRIC RAILWAY JOURNAL, although the turbines in the power house became flooded with water at the time, none of the generating apparatus was seriously damaged, and by 2.30 a. m. on Jan. 7 lighting service was resumed in Pottsville and a portion of the other districts served by the company. By the night of Jan. 8 electric light and power service was entirely restored. Electric railway service was largely resumed on Jan. 9 and by the following day was in practically full operation again. The total loss involved in the fire, which Mr. Pardee estimates roughly at $200,000, is fully covered by insurance. The J. G. White Management Corporation, New York, is operating manager of the property.

Underground Terminals for Cleveland

At an open meeting of the subway committee of the City Planning Commission of Cleveland, Ohio, on the evening of Jan. 4, a decided sentiment developed in favor of underground terminals for the street railways in the downtown district. Both the members of the committee and citizens who attended the meeting expressed themselves in such a way as to give an impression of opposition to the proposed underground plan for which the Cleveland Underground Rapid Transit Company holds a franchise. Fielder Sanders, street railway commissioner, expressed himself in favor of the terminal idea. Chairman Morris A. Black asked the county engineer to put into writing suggestions made at the meeting which cover the following points:

A complete survey of the traffic conditions to be alleviated by the subway terminal to be built by the city.

Preparation of a tentative contract between the city and the Cleveland Railway for the use of the subway.

Presentation to the public of exact figures showing the cost of the proposed subway system, the benefits it would bring and what the railway would have to pay for its use.

The utilities committee of the Cleveland Chamber of Commerce has for two years or more been giving this phase of railway traffic close study. Its report may be made to the chamber within a short time. It is understood that the committee does not favor the construction of the subway terminals by the city. Rather, it would have the terminals built by the Cleveland Railway under the Tayler franchise. A study of the situation at Boston is said to have convinced the members that this improvement will increase business to such an extent that the additional investment would not endanger the present rate of fare. The committee does not favor building long underground lines.

Trial of Strike Damage Case

After a series of prolonged delays the trial of the action brought against the County of Erie by the International Railway, Buffalo, N. Y., in an effort to recover $108,410 damages for property alleged to have been destroyed during the street railway strike riots in the spring of 1913, was started before Justice Louis W. Marcus in the Supreme Court of Erie County on Jan. 6. After obtaining a jury, Thomas A. Sullivan, former county attorney, who appears for the defense, argued for the dismissal of the complaint. He contended that the entire county could not be held responsible for damage done to the company's property within the city of Buffalo. The court must render a decision on this point before the witnesses testify.

James O. Moore, of Norton, Penney, Spring & Moore, of counsel for the International Railway, opposed the dismissal of the suit. He reviewed briefly the efforts of the city and later the county to stop the riots and damage to the company's property. He said the city police were unable to stop the riots and hundreds of extra police were sworn in by Michael Regan, who was then chief of police. As the city was unable to restore order, the International Railway appealed to the county authorities, according to Mr. Moore, and when this agency was unable to handle the situation, Mr. Moore argued that on the company's application two regiments of the New York National Guard were pressed into strike and riot duty. In continuing his argument against the dismissal of the complaint against the county, Mr. Moore declared that the county should be required to defend the action as the county sheriff has greater authority in handling strike riots than the city police department. A similar action is pending against the city of Buffalo and Mr. Moore argued that the city and county should be held jointly responsible for damage to the company's property because of the failure of the city and county authorities to afford adequate protection.

Scores of witnesses have been subpoenaed by the International Railway in its efforts to prove every item of damage listed in its complaint and bill of particulars which was demanded by the county. Almost a score of newspaper men who were assigned to "cover" the strike, including the Buffalo correspondent of the ELECTRIC RAILWAY WAY JOURNAL, have been subpoenaed to tell of specific acts of rioters who broke car windows, intimidated loyal employees and caused other damage to the company's property in all sections of the city. In some instances members of the National Guard who were called to do strike duty are accused by witnesses of having aided in destroying the company's property.

Old Street Railway Ordered Removed.—The City Commission of San Angelo, Tex., has ordered the rails and ties of the old San Angelo Street Railway removed from the city streets. The tracks are the property of J. D. Suggs, who operated the system for several years. The city recently granted a franchise to the Interstate Electric Corporation, New York, which will install and operate a street railway system here. Mr. Suggs about a year ago offered to present the old railway to the city.

Municipal Power Sales to Street Railways.—When Massachusetts cities and towns were first authorized to engage in the manufacture or distribution and sale of electricity in 1891, they were excluded from supplying it for the operation of electric cars. In its annual recommendations for legislation just filed with the General Court, the Gas & Electric Light Commission states that any justification for this restriction has long since ceased to exist and recommends authorizing municipal plants to distribute and sell electricity for this purpose if they see fit.

Louisville Veteran Dead.—Patrick J. Lally, Louisville, Ky., after nearly forty years' service in the employ of the Louisville Railway, is dead of pneumonia at his home in Louisville. Inspectors and old employees of the company were his pallbearers. "Pat" Lally began as driver, lasting one day, after which he was put in charge of the old transfer station. He had been for many years an inspector and was known personally to thousands. His popularity was attested by the fact that he was chosen in a newspaper popularity contest to make a trip covering the East.

Experiment with New Car Gate in New York.—At a hearing on Jan. 8 before the Public Service Commission for the First District of New York, George Keegan, assistant to Frank Hedley, vice-president and general manager of the Interborough Rapid Transit Company, agreed that the company install for trial types of folding platform gates on the Third Avenue elevated line, similar to those in use now in Brooklyn. The cost, Mr. Keegan said, would be about $75 a car, and upon his statement the case before the commission, dealing with the question of a new type of gate, was closed pending the result of the trial. The company will experiment with several types of gates on the two trains.

Illinois Jitney Men Lose.—The jitney bus men of Rock Island and Moline, Ill., have lost the first round in court in the injunction sought by the Public Utilities Commission to restrain them from operating until certificates of convenience and necessity are secured. Judge Ramsey overruled a motion for rule upon Attorney-General Lacey and C. J. Searle, attorney for the Tri-City Railway, to show cause why they should not be permitted to maintain the action. The court held, however, that the demurrer filed by the jitney bus men against the injunction petition was proper and it is upon this manner that the petition itself will be argued to the court.

Bonuses in Indianapolis.—The Indianapolis Traction & Terminal Company, Indianapolis, Ind., has paid bonuses to 500 conductors and motormen, ranging from $30.33 to small amounts. This is in keeping with the announcement made by the company last July that a sum would be paid equal to what the men would have received had the increased wage scale gone into effect on July 8. The company announced in July that the new wage scale would go into effect on Jan. 1 and that bonuses would be paid to compensate the men for that time from July to January. From Jan. 1 conductors will receive 22 cents an hour for the first year of service to 30 cents an hour for men who have been in the service for seven years or more.

Final Hearings Soon on Riverside Plans.—Although opposition to the city's plan for improving Riverside Drive, New York City, and relocating the tracks of the New York Central Railroad along the west side has increased steadily since the plans were made public nearly a year ago, indications are that the Board of Estimate will approve the proposal and that the work will proceed within the next few months. Mayor Mitchel and Controller Prendergast were responsible for the original plans. Final public hearings will be held before the Board of Estimate within a week or two and then the board will act upon the proposed contract with the New York Central Railroad. This contract will include a provision for the electrification of the line.

Increase in Wages in Oklahoma City.—On Jan. 1, 1917, the Oklahoma Railway, Oklahoma City, Okla., voluntarily made the following raise in wages to conductors and motormen: First year, from 20 cents an hour to 21 cents an hour; second year, from 22 cents an hour to 23 cents an hour; third year, from 24 cents an hour to 25 cents an hour; fourth year, from 25 cents an hour to 27 cents an hour; fifth year, from 26 cents an hour to 28 cents an hour; sixth year, from 27 cents an hour to 29 cents an hour; seventh year, from 28 cents an hour to 30 cents an hour; eighth year, from 29 cents an hour to 31 cents an hour; ninth year, from 30 cents an hour to 32 cents an hour. The new rates cover both the city and the interurban lines.

Compulsory Strike Investigation Plan Proposed.—On Jan. 6, Chairman Adamson of the committee on interstate and foreign commerce of the House of Representatives introduced the administration's railroad legislation bill providing for compulsory investigation of labor disputes. The bill proposes a special board of inquiry to ascertain the facts in each case and to report as soon as possible with recommendations for a settlement, in no event later than three months from the reference of the controversy to it, all strikes being prohibited during the period of investigation. The bill also provides that the President shall have power to take possession of the railroads in emergencies. The Adamson bill is the same as the Newlands bills now pending in the Senate, except that the former also prescribes an eight-hour day for all railroad employees in interstate commerce.

Central Brooklyn's Transit Problem.—The Public Service Commission for the First District of New York, through Chairman Oscar S. Straus, has submitted to T. S. Williams, president of the New York Municipal Railway Corporation of Brooklyn, the exact position of the Public Service Commission with respect to the solution of the transit problem of Central Brooklyn, including the proposed completion of the third-tracking of the Fulton Street line. This letter followed one from President Williams in which he stated the willingness of the company to agree to certain changes in the plans already formulated for Brooklyn, but to which were added a number of additional conditions to which the commission has declined to agree. The commission informed President Williams, and through him the Brooklyn company, that in the event that it prefers litigation to cooperation the commission, while it would regret such an alternative, is ready to face it.

Injunction Sought in Illinois Traction 5-Cent Fare Case.—City Counselor Daues, of St. Louis, Mo., on Dec. 28, applied for an injunction in the United States District Court to restrain the Illinois Traction Company from increasing the passenger fare between St. Louis and Granite City, Ill., from 5 to 10 cents on Jan. 1. The increase was authorized by the Interstate Commerce Commission. A bill is pending in the Board of Aldermen of St. Louis to repeal the franchise of the company because the rate increase violates a provision in it limiting the fare to and from the tri-cities to 5 cents for adults. The Aldermen refused to direct that an injunction suit be filed by the counselor on the ground that such a suit would conflict with the proposal to repeal the franchise. The United States, the Interstate Commerce Commission and the Illinois Traction Company are named as respondents in the injunction proceedings. Under the law such suits must be tried before at least three federal judges, one of whom shall be a member of the Court of Appeals.

Plans for Large Car Storage Yard.—The Public Service Commission for the First District of New York is negotiating with the city authorities with a view to utilizing a part of the westerly portion of the Jerome Avenue reservoir tract for a storage yard for subway cars in connection with the operation of the Jerome Avenue extension of the Lexington Avenue subway. The westerly portion of the reservoir tract adjoining Jerome Avenue has never been improved by the city. Commission, city and railroad company engineers are studying the tract with a view to determining what portion of it could best be utilized for the purposes desired with the least detriment to other property in the neighborhood. If the city decides to take a sufficient amount of this tract to provide a storage yard for 250 subway cars, it will be possible for the city to make available for other uses a certain sum equivalent to the value of the property taken from rapid transit funds and it will not be necessary to exempt from taxation other property upon which taxes are now paid.

Programs of Association Meetings

Massachusetts Street Railway Association

The regular monthly meeting of the Massachusetts Street Railway Association has been postponed to Jan. 17, at Young's Hotel, Boston, when Joseph C. Pelletier, District Attorney of Suffolk County, will speak on "The Life About Us."

Illinois Electric Railway Association

The annual meeting of the Illinois Electric Railway Association will be held at the La Salle Hotel, Chicago, Ill., on Jan. 19. An interesting program has been arranged to include an exhibition of the moving-picture film, "The King of the Rails," showing the construction of the electric locomotives and the electrification of the Chicago, Milwaukee & St. Paul Railroad. A paper by G. M. Woods, of the Westinghouse Electric & Manufacturing Company, on "The Effect of Low Voltage on Railway Motors," will be read. K. W. Mackall, electrical engineer of the Ohio Brass Company, will read a paper on "Headlights," and M. J. Feron, general superintendent of transportation, Chicago Elevated Lines, will present a paper on "How Trainmen Are Developed into Motormen."

Financial and Corporate

Capital Stock Tax Rulings

Tax Based on Average Value of Stock—Payment Due in Advance for Privilege of Doing Business—Holding Companies Subject to Tax

In an opinion just made public the United States Commissioner of Internal Revenue has made specific rulings on questions that have been raised in connection with the special excise tax of 50 cents for each $1,000 of fair value of the capital stock of corporations, this tax being due as of Jan. 1, 1917, and having an exemption limit of $99,000. It is held that the new tax is a tax on the privilege of doing business similar to occupational taxes on individuals, that it is to be measured by the average value of capital stock during the preceding year and is to be paid in advance like other privilege taxes.

To give the opinion more in detail, it is stated that where the capital stock of a corporation is worth $100 per share, par value, and the corporation reports 10,000 shares, having a total value of $1,000,000, and also reports a surplus of $500,000 and undivided profits of $50,000, the book value of such stock would be $1,550,000. This should be taken as the basis of the approximate value of the stock per share ($155), unless by reason of earning capacity the real value is in excess of the book value, or unless for any reason the book value is fictitious and is shown by overestimating the value of assets.

If the "average profits per share earned during the preceding five years" indicate an "estimated earnings capacity" in excess of the book value, the fair value of the capital stock may be based upon a reasonable return on capital invested, dependent on the hazards of the business and on the prices which the stock of corporations engaged in a similar character of business brings in the open market. If the book value is fictitious and is shown by overestimating the capital assets, this fact should be fully explained and may be given allowance in determining the fair value of stock.

In regard to holding companies, it is said that where such a company owns all the stock of several subsidiary corporations which is not listed on any exchange or which has not been sold in the last fiscal year, the fair value of the stock of such subsidiary companies may be estimated from the market value of the total capital stock of the holding company (the parent corporation) by apportionment of the fair value of the total capital stock of the holding corporation among the subsidiary companies. This, however, does not relieve the holding company from its liability to the special excise tax.

Corporations estimating the fair value of their stock should comply strictly with the provisions in the regulations by taking "the average price at which sales were made during the preceding fiscal year" and not the average selling price per share. Thus, if ten shares were sold at $100, and 1000 shares were sold at $70, the average price at which sales were made would be $85. The average selling price in such a case would be $70.29, but this price will not be accepted as an average fair value. Corporations protesting against this method may file a statement of facts for the Washington office.

The new tax, it is stated, is an excise tax on the privilege of doing business. Being a privilege or occupational tax, it is payable in advance for a period from the time the act goes into effect to the end of the fiscal year and annually thereafter in July, the beginning of the government's fiscal year. The tax is payable to the collector at any time after Jan. 1, 1917, but penalties for nonpayment do not attach until ten days after notice and demand therefor has been served by the collector upon the taxpayer. It is a condition precedent that a corporation to be liable to the tax must have been engaged in business some time during the preceding taxable (fiscal) year.

Annual Report

Seattle Municipal Street Railway

The statement of income of the Seattle (Wash.) Municipal Street Railway for the year ended Nov. 30, 1916, follows:

Passenger revenue	$33,651
Freight revenue	9,139
Miscellaneous revenue	2,785
Total revenues	$45,575
Way and structures	$6,530
Equipment	2,330
Power	12,946
Passenger conductors and motormen	18,993
Freight conductors and motormen	2,622
Car house employees	4,949
Other transportation employees	750
Other transportation expense	981
Traffic	....
General and miscellaneous	5,886
Total expenses	$55,988
Operating deficit	$10,413
Interest on bonds	19,125
Total deficit	$29,537

The total revenues during 1916 showed an increase of $9,160 or 25 per cent over those of the preceding year, and the operating expenses fell off $4,084 or about 7 per cent. The passenger total in the last year was 699,430 and the number of car miles run 317,345 for passengers and 12,750 for freight. On Division "A" the passenger revenues per car mile in 1916 were 12.13 cents and the expenses 14.49 cents, as compared to 11 cents and 19.02 cents in the preceding year, while on Division "C" the passenger revenues were 10.81 cents and the expenses 19.18 cents, as compared to 10.07 cents and 18.03 cents in 1915, and the freight revenues were 71.68 cents and the expenses 20.57 cents as compared to 47.15 cents and 20.51 cents the year before.

According to the annual report of the department of public utilities of the city of Seattle for the year ended Nov. 30, 1916, from which the foregoing statement is taken, the passenger business on Division "C" did not increase during the last year; in fact, the Sunday travel dropped off considerably. The unusually cold and backward summer had a good deal to do with it, but the increased number of automobiles had a marked effect upon the revenue of the line. Division "C," however, prospered more than Division "A," owing to an increase in freight business. Paving material for the Seattle-Des Moines highway was hauled over the company's lines from May until September and increased the revenue by $3,000. Another big factor in increasing freight revenue was a log-hauling contract which was begun in July and will continue probably until spring. The revenue derived from this source will probably be between $5,000 and $6,000.

According to Superintendent A. L. Valentine, the receipts of Division "C" for the last year were greater than ever before, and a profit was shown for several months, but this is only a temporary improvement depending upon an unusually large amount of freight business. To attain a stable and profitable revenue for this line, the territory served must become more thickly populated. With the enormous increase in industrial activity now centering around the east and west waterways, it is said that the Lake Burien territory should build up accordingly, but it will not get its full share until the car line has been run into the city.

Relief for the Boston Elevated

Partial relief, at least, for the Boston (Mass.) Elevated Railway, is forecasted by an informal vote of the special investigating commission at a meeting during the week ended Jan. 6 in anticipation of a report due soon for presentation to the 1917 Massachusetts Legislature. The board is known to favor returning to the company the $500,000 guarantee deposited with the State twenty years ago to insure the property damages accruing from the building of the elevated lines in Boston. The commission agrees with the company that the necessity for this deposit has passed. The board also favors the public ownership of the Cambridge subway, but will probably leave to the Legislature the question whether it is to be purchased by the State or by the city. Inclosed transfer areas are also favored by the commission with no specification as to their locations. These are to be left to the discretion of the company, subject to the approval of the Massachusetts Public Service Commission or the Boston Transit Commission, as the Legislature may determine. The report will probably include discussions of increased rate of fare and reduced taxation, but the views of the commission upon these topics are not available at this writing except that the likelihood of fare unit increase recommendations may be considered doubtful at this time.

The Boston Chamber of Commerce is now considering a report of its public utilities committee on the company's financial situation, among the signers being Russell Robb of the firm of Stone & Webster, John E. Oldham of Merrill, Oldham & Company, and also Hammond V. Hayes, a rate and engineering expert of the New England Telephone & Telegraph Company, Boston. This report favors relief which will increase the net revenue of the company; advocates an increase in fare if no other adequate relief can be obtained; holds that the purchase of the Cambridge subway by the State may be helpful but does not meet the basic need of the system; opposes city or state contributions; favors the elimination of certain paving burdens and the inclosing of transfer areas or reduction of certain free transfer facilities. The report points out that when the city or state contributes toward the expense there is no automatic rectifying force, the contribution being general and quickly forgotten, while a contribution in the form of fares is personal, and automatically creates an interested and watchful body of critics, between whom and the company the Public Service Commission must sit in judgment.

San Francisco Deposit Time Extended

Two Committees, One Eastern, the Other Western, Seek Deposit of United Railroad's 4 Per Cent Bonds

The committee of bankers of San Francisco, Cal., which has put forth a reorganization plan for the United Railroads of San Francisco, has issued a circular to holders of the 4 per cent bonds stating that up to Jan. 1 there had been deposited with the committee $9,500,000 of the bonds from 900 bondholders. The committee has extended the time for deposit of the bonds to Jan. 31 and announces that unless a majority of the 4 per cent bonds has been deposited by that date the committee will feel compelled to abandon the plan, return the deposited bonds and retire from further connection with the re-organization of the company.

Meanwhile a new committee composed of Baltimore, Philadelphia and New York men has been formed and is asking for deposit of the bonds in opposition to the San Francisco plan. This committee is headed by John Henry Hammond of Brown Brothers & Company, New York, as chairman. Other members of the committee are Donald G. Geddes, of Clark, Dodge & Company, New York; B. Howell Griswold, Jr., of Alexander Brown & Sons, Baltimore; A. H. S. Post of the Mercantile Trust & Deposit Company, Baltimore, and Edward B. Smith of Edward B. Smith & Company, Philadelphia.

The San Francisco committee states that it is convinced that, under existing conditions, a more favorable plan for the bondholders cannot be made, and that if its plan be abandoned, foreclosure suit will follow and the bondholders will be compelled to contend for their rights in the courts. It calls attention to the foreclosure proceedings brought on the $1,800,000 of Market Street Cable Railway 6 per cent bonds and says that immediate action by the holders of the 4 per cent bonds is imperative. The committee asserts that it is willing to do all in its power to help get the company out of its difficulties, but unless a majority of the 4 per cent bonds is deposited by Jan. 31, it will give up its plan as it will be unable to proceed further.

Brooklyn (N. Y.) City Railroad.—At the annual meeting of the board of directors of the Brooklyn City Railroad, on Jan. 9, Frank Lyman was re-elected president of the company and Z. E. Watson was re-elected secretary and treasurer. Henry F. Noyes was elected vice-president to succeed Richard L. Edwards, who had been vice-president of the company since Jan. 14, 1908. The Brooklyn City Railroad is operated under lease by the Brooklyn Rapid Transit Company.

Detroit (Mich.) United Railway.—As noted in the ELECTRIC RAILWAY JOURNAL for Dec. 30, 1916, page 1365, the stockholders of the Detroit United Railway will take action at the annual meeting on Feb. 6 on the recommendations of the board of directors to increase the capital stock of the company from $12,500,000, all outstanding, to $25,000,000, to provide from time to time for funds necessary for the acquisition and construction of additional lines of railway, the purchase of rights-of-way, equipment, etc., for the growth and development of the property. In a supplementary notice to the stockholders F. W. Brooks, president of the company, announces that with the authorization of the additional issue the management will recommend that during 1917 there shall be issued $2,500,000 of the new stock for the purposes mentioned and that stockholders shall receive the right to purchase the same at par in proportion to their holdings of the present stock.

Bloomington & Normal Railway & Light Company, Bloomington, Ill.—The Bloomington & Narmal Railway & Light Company, controlled by the Illinois Traction Company, has filed at Springfield notice certifying to an increase in the capital stock of the company from $1,650,000 to $1,900,000. The company is reported unofficially to have $1,200,000 of common stock and $450,000 of 6 per cent cumulative preferred stock outstanding at present.

El Paso (Tex.) Electric Railway.—The El Paso Electric Railway has filed an amendment to its charter at Austin increasing its capital stock from $2,500,000 to $3,500,000. The proceeds of the $1,000,000 of additional capital will be used for additions and betterments.

Georgia Railway & Power Company, Atlanta, Ga.—Payment of accumulated dividends at 6 per cent for the years 1913, 1914, 1915 and 1916, or 24 per cent total, on the company's first preferred cumulative 6 per cent stock issue of $2,000,000 was authorized on Dec. 28 by the directors of the Georgia Railway & Power Company. This payment was ordered to be made to all stockholders as of record at the close of business on Jan. 5, as follows: $60,000 in cash on Jan. 15, and $420,000 in company non-interest bearing scrip to be delivered also on that date and to be payable $30,000 semi-annually for the ensuing seven years, beginning on July 1, 1917. The issuance of the scrip is subject to the approval of the Georgia Railroad Commission, which has been petitioned formally for that approval and will hear the petition on Jan. 11. A statement issued by the company with the announcement of this action invited attention to the fact that following the payment on Jan. 1, 1913, of the 6 per cent preferred dividend accrued at that date in the several months since the company's organization, heavy demands were made upon the company for the expenses of construction and other new work in the development of its water-power properties. All earnings were diverted to meet those demands, which ceased some months ago when the company completed the building of its foundations. It is regarded as probable that the cumulative dividends on this first preferred stock will be paid hereafter by the company annually as they fall due. Application for authority to issue $283,000 par value of refunding and improvement forty-five 5 per cent bonds has been filed with the Georgia Railroad Commission by the Georgia Railway & Electric Company. The petition will be heard on Jan. 11. The bonds are to cover additions and improvements made during 1916. The Georgia Railway & Power Company has petitioned the Railroad Commission for authority to issue $459,000 par value of first and refunding mortgage bonds to reimburse the treasury for cash advanced for the acquisition and improvement of new properties. The commission will hear the matter on Jan. 11.

Kansas City (Mo.) Railways.—The Kansas City Railways has bought in the Kansas City Elevated Railway for $260,000 and the Kansas City & Westport Belt Railway for $100,000. They were auctioned off from the court house steps by Rush C. Lake, one of the federal court commissioners in the settlement of the receivership of the Metropolitan Street Railway, the predecessor of the Kansas City Railways. The sale is a mere form resulting from the receivership.

Kentucky Securities Corporation, Lexington, Ky.—An extra dividend of 1 per cent has been declared on the $2,154,920 of preferred stock of the Kentucky Securities Corporation on account of accumulations, along with the regular quarterly 1½ per cent, both payable on Jan. 15. This disposes of all the accumulated dividends on this issue.

Minster & Loramie Railway, Ft. Loramie, Ohio. — The First National Bank, New Bremen, Ohio, has filed an action in Common Pleas Court asking that a receiver be appointed for the Minster & Loramie Railway. The action states that in the October term of court in 1916, the plaintiff received a judgment for $1,083, which has not been paid. The bank is the owner of bonds of the railway of a total par value of $20,000, constituting the entire bonded indebtedness of the company. These bonds are dated July 1, 1914, and are secured by a first mortgage. The bank says that the railroad is in default of the payment of interest on the bonds since July 1, 1915. The bank also owns eighty-seven shares of stock of a par value of $100 each.

New York State Railways, Syracuse, N. Y.—The directors of the New York State Railways have reduced the common stock dividend from 1¼ per cent to 1 per cent quarterly. Last April the dividend was increased from 1 per cent quarterly to 1¼ per cent.

Norton, Taunton & Attleboro Street Railway, Norton, Mass.—The Massachusetts Public Service Commission has authorized the Norton, Taunton & Attleboro Street Railway, the successor to the Norton & Taunton Street Railway, to issue $120,000 of capital stock.

Omaha, Lincoln & Beatrice Interurban Railroad, Lincoln, Neb.—The Omaha, Lincoln & Beatrice Interurban Railroad has been authorized by the Nebraska Railroad Commission to issue $2,000,000 of common stock and $500,000 of preferred stock and $2,500,000 of bonds for building and completing its line from Omaha to Lincoln.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—The San Francisco-Oakland Terminal Railways has issued a statement concerning the arrangement with local banks under which they have agreed to purchase the coupons due in January and in default. The company said: "This company was unable to pay, on their due date, coupons of the San Francisco-Oakland and San José Consolidated Railway, maturing Nov. 19, 1916, and will likewise be unable to pay, on their due dates, the various coupons maturing during the month of January, 1917. Actuated by a desire to preserve the status of the company's securities, pending the outcome of efforts to bring about a franchise resettlement, certain San Francisco and Oakland banks have again offered, as a matter of accommodation to bondholders desiring to cash their coupons at the respective due dates, to purchase these coupons at the full face amount thereof, less income tax, provided they are accompanied by a bill of sale similar to that used last July, such bill of sale being necessary, in the opinion of the attorneys for the purchasing banks, to protect moneys advanced by them. The banks joining in this advance consist of the Anglo & London Paris National Bank, the German Savings & Loan Society, Mercantile National Bank of San Francisco, Savings Union Bank & Trust Company, Central National Bank, Oakland; the Oakland Bank of Savings and the First National Bank, Oakland."

Scranton (Pa.) Railway.—The American Railways has elected to purchase at 102½ and interest on March 1 all of the outstanding $1,500,000 of 5 per cent preferred stock gold trust certificates of the Scranton Railway due in 1935.

Sherbrooke Railway & Power Company, Sherbrooke, Quebec.—The Southern Canada Power Company, Ltd., Drummonsville, Quebec, has offered to take over 51 per cent of the capital stock of the Sherbrooke Railway & Power Company, proposing to increase its own capital stock and create a 6 per cent preference stock, cumulative from Jan. 1, 1920. One share of this preference stock will be given in exchange for four shares of the capital stock of the Sherbrooke Railway & Power Company. If this is acceptable to the shareholders control will be transferred immediately. It is reported that shareholders holding about one-fourth of the capital stock of the Sherbrooke Railway & Power Company have signified their intention of accepting the offer.

Springfield Terminal Railway & Power Company, Springfield, Ohio.—Warner & Fitzharris, Philadelphia, Pa., are offering with C. W. Anderson & Company, Chicago, Ill., $250,000 of first mortgage 6 per cent serial gold bonds of the Springfield Terminal Railway & Power Company, the successor to the Springfield, Troy & Piqua Railway. The proceeds of the bonds will be used to fund floating indebtedness. They will be the new company's only indebtedness. The total authorized issue is $350,000. The bonds are dated Dec. 1, 1916, and mature serially, the last maturities ($50,000) being in 1926. The remaining bonds can be issued only for betterments and additions to the extent of 85 per cent of their cost.

Dividends Declared

Central Illinois Public Service Company, Mattoon, Ill., quarterly, 1½ per cent, preferred.

Chicago (Ill.) Railways, 2 per cent, participating certificates, series 2.

Kentucky Securities Corporation, Lexington, Ky., quarterly, 1½ per cent, preferred; 1 per cent preferred on account of accumulated dividends.

New England Investment & Security Company, Springfield, Mass., 2 per cent, preferred.

Ottumwa Railway & Light Company, Ottumwa, Iowa, quarterly, 1¾ per cent, preferred.

Pacific Gas & Electric Company, Sacramento, Cal., quarterly, 1½ per cent, common.

Puget Sound Traction, Light & Power Company, Seattle, Wash., quarterly, 75 cents, preferred.

United Railways & Electric Company, Baltimore, Md., quarterly, 50 cents, common.

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov., '16	$73,298	*$41.330	$31,968	$18.408	$13.560
1 " " '15	65,711	*33.353	32.358	17.624	14,734
12 " " '16	823,553	*453,550	370,003	213,869	156,134
12 " " '15	787,035	*395,785	391,250	212,351	178,899

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

1m., Nov., '16	$80,136	*$72,091	$8.045	$27 550	†‡$19.277
1 " " '15	72,855	*62,253	10.602	16,786	†‡5 956
5 " " '16	454,186	*369.025	85,161	138,456	†‡52,343
5 " " '15	425,640	*321,885	103,755	84,526	†‡20,059

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO

1m., Nov., '16	$35,957	*$21,316	$14 641	$11,649	$2.992
1 " " '15	33.940	*16,844	17,096	11,096	6.000
11 " " '16	426.104	*241,786	184,318	125.691	58,627
11 " " '15	392,346	*211,860	180,486	120.938	59,548

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

1m., Nov., '16	$316,468	*$184.587	$131,881	$42,862	$89,019
1 " " '15	277 008	*154.959	122.049	41,197	80.852
12 " " '16	3.500.760	*2,069.138	1,431.622	513.997	917.625
12 " " '15	3,091,422	*1,833,337	1,258,085	475,142	782,943

COMMONWEALTH POWER. RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

1m., Nov., '16	$1,510.666	*$860,290	$650 376	$426.081	$224,295
1 " " '15	1,323.673	*674.794	648.879	403,980	244,899
12 " " '16	16.705,218	*9,064.088	7 641.130	5,020,444	2,620,686
12 " " '15	14,317,036	*7,599,095	6,717,941	4,428,639	2,289,302

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

1m., Nov., '16	$450,652	*$346,949	$103,703	$119.161	†‡$14.499
1 " " '15	417,448	*332,972	84.476	120.461	†‡34,387
5 " " '16	2,601,745	*1,815.365	786 380	601,994	‡217.628
5 " " '15	2,315,598	*1,696,815	618,783	602,135	‡49.925

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

1m., Nov., '16	$479 367	*$242.563	$236,804	$182.115	$54.689
1 " " '15	455.165	*250,683	204.482	182,363	22,119
12 " " '16	5,453,455	*3,035,833	2.417,622	2,177.998	239 624
12 " " '15	5,542,900	*3,073,832	2,469,068	2,208,504	260,564

WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.

1m., Nov., '16	$14,063	*$17,211	$3,148	§$2.018	†‡5,138
1 " " '15	19,847	*21,425	1,578	§1,723	†‡3.271
5 " " '16	92,436	*98 772	6,336	§9,455	†‡15.657
5 " " '15	116,228	*109,218	7,010	§8,116	†‡957

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

Ruling in Toilet Case

Pennsylvania Commission Decides That No General Order Be Issued—Specific Complaint Dismissed

The Public Service Commission of Pennsylvania at Harrisburg, Pa., on Jan. 8 handed down a decision in which it is declared that no general order should be made requiring the placing of toilet facilities in the cars of interurban lines. Several months ago the commission called a special conference of the representatives of the electric railways of Pennsylvania at Harrisburg to consider the question of whether a general order or special regulations affecting special cases should be issued. The general opinion of the officers of the railways was that a general order would work a great hardship upon all interurban railways since no two companies operated under exactly the same conditions. In the opinion of the Public Service Commission of Pennsylvania this viewpoint is upheld.

The case upon which the ruling is made is that of James M. Maurer, Reading, against the Oley Valley Railway. Mr. Maurer is a member of the Pennsylvania Legislature and president of the Pennsylvania Federation of Labor, in politics a Socialist and the only member of that party in the General Assembly of the Keystone State. His complaint was in effect that the company and other interurban railways fail to furnish their patrons with proper toilet facilities. He asked for a general order directed against all interurban railways in the State. In the particular case under consideration, in addition to refusing to issue a general order, the complaint against the Oley Valley Railway is dismissed.

The opinion of the commission, written by Commissioner John S. Rilling, is as follows:

"The respondent, the Oley Valley Railway, operates an interurban electric railway from Reading to the Borough of Boyertown, in Berks County, a distance of about 23 miles, its cars making a trip each way every one and one-half hours on week days and every hour on Sundays and holidays. The running time between terminals is one hour and twenty minutes.

"The territory through which the respondent operates is thickly populated and a rich agricultural district. The railway operates on a 5-cent basis and less than 10 per cent of its patronage is through traffic.

"The complaint is that the respondent and other interurban railways fail to furnish their patrons with proper toilet facilities, and asks for a general order directed against all interurban railways in this State.

"It appears that some interurban railways in Pennsylvania already have their cars equipped with proper toilet facilities.

"The subject matter of this complaint is one of importance to the public and good reasons may be urged in favor of the order asked for.

"After due consideration we have reached the conclusion that no general order should be made for the reason that no two interurban railways operate under the same conditions. The length of the route, the running time, the territory traversed, the amount of and character of travel, the density of the population as well as many other facts must all be considered.

"We are of the opinion, considering the length of the respondent's route, its running time, the amount and character of its traffic, the benefits to be derived as well as the inconvenience that would result from an order as asked for, that the complaint in the case under consideration should be dismissed."

An order attached to the opinion dismissed the complaint as of Jan. 3, 1917.

The testimony at the conference at Harrisburg on Nov. 17 on this matter was summarized in the ELECTRIC RAILWAY JOURNAL of Nov. 25, 1916, page 1129.

B. R. T. Starts Efficiency Campaign

A joint efficiency campaign of the men and management of the Brooklyn (N. Y.) Rapid Transit System has been inaugurated on approval of President T. S. Williams.

This campaign, which is described by S. W. Huff, vice-president of the company, in the *B. R. T. Monthly* for December, includes practically all departments where men are employed in large numbers and the plans which are now nearing completion will extend these educational efforts to the surface transportation department, the New York Consolidated Railroad, operating the rapid transit lines, the department of way and structure, the mechanical department and the electrical department.

The object of the educational program will be to make each individual employee realize how his personal efficiency in the performance of his duties can contribute to his own standing and prospects, to the prosperity of the company and to the service which the public receives. Each individual will be reminded of certain definite matters covered by outstanding rules and regulations in which personal efficiency results in a direct gain in net earnings, and the lack of it makes equally certain not only loss to the company, but loss of his own standing in the company service.

The joint efficiency campaign is the outcome of studies which have been made by a special committee on increased net earnings appointed several weeks ago by Colonel Williams.

Because of the wide variety of operations which have to be conducted in the Brooklyn Rapid Transit System, each department proposing to participate in the joint campaign is working out the educational methods best suited to its conditions. In general, however, the educational work will be based on a series of bulletins in each participating department, taking up and explaining a number of the rules and regulations of such department in which the attainment of increased individual efficiency means increased net earnings for the company.

Jitney Matters in Portland

According to a decision of four members of the City Council of Portland, Ore., no franchise will be granted the Union Motor Bus Company to operate jitneys in that city unless the company accepts routes over streets on which there are no street railway lines. This means that the company, which is composed of more than 200 of the owners of jitneys in Portland, must meet the terms of the Council or go out of business.

The Council outlined a proposed standard zone system, governing the charges for taxicabs, which operate under the zone system. This system will supplant the one prepared by Commissioner Daly, which did not meet with the approval of the other members of the Council. Commissioner Daly's plan would permit the taxi-jits to operate on a 5-cent basis on the old jitney routes. Under the new scheme, it is hoped to prevent taxi-jits from operating on a 5-cent fare basis, forcing the operators to take out a jitney franchise, or cease operation. There will be a dozen or fourteen zones in the entire city, while under Mr. Daly's plan the city was divided into 108 zones.

The Portland Trackless Car Company, a subsidiary of the Portland & Oregon City Railway, has filed an application for a franchise to operate jitneys on four additional routes. This makes eight routes for the operation of jitneys sought by this company. It is proposed to make this jitney line a feeder for the Portland & Oregon City Railway and to give transfers from one line to another.

The Council of Portland is considering the granting of a franchise to W. M. Foster for the operation of a line of jitneys between Portland and Linnton. The applicant agrees to pay the city $50 a quarter for each car, and provide a bond of $10,000 to idemnify the city or the public against damage or loss. A 10-cent fare will be charged on account of the long haul, and ten passenger cars will be operated. The Union Motor Bus Company has announced that it will apply for a franchise over the same route.

Because Commissioner Daly of the Department of Public Utilities of Portland, Ore., refused to approve the proposed "standard" zone system, prepared by Commissioner Dieck, to govern the operation of taxicabs and taxi-jit, Mayor Albee has taken away the supervision of all transportation utilities and all franchise matters, and the administration of all ordinances relating thereto, from Commissioner Daly and transferred this authority to Commissioner Dieck.

Service Improvements in Harrisburg

Extensive plans for service improvement on the lines of the Harrisburg (Pa.) Railways were announced on Jan. 1 by Frank B. Musser, president of the company. Changes in schedules giving more frequent service are being arranged, and on Dec. 30 a contract for ten new cars was placed with The J. G. Brill Company, Philadedphia, Pa. The first of these will be delivered during the latter part of May and will probably be used for the first time on Memorial Day. Five of the new cars will be of the all-steel type, similar to the 800 series recently placed in service. These will be used on the suburban lines. The other five will be for city lines and will be similar to the 600 series with longitudinal seats.

Mr. Musser intimated that other changes may be expected in the near future, and said that men are being stationed at congested street intersections to study how traffic conditions can be bettered so that cars can be kept on schedule during the busy hours of the day. Action on further improvements will probably be taken at the annual meeting of the board of directors to be held in March. Work has been started on remodeling and repairing some of the special cars used in the morning and evening to haul the workmen to and from Steelton.

New Company Publication in Baltimore

The United Railways Forum is the title of a new monthly employees' magazine prepared by the United Railways & Electric Company, Baltimore, Md., the first issue of which is dated Jan. 1. The new periodical is introduced in a foreword by W. A. House, president of the company, the theme of which is embodied in the slogan of the company that "The United spirit stands for safe service, courteous service, efficient service." The plan of the new magazine is to print articles upon various phases of the street railway work; the local problems which the company is called upon to face and the means for their solution. It will also devote liberal space to the recreation activities and personal news of the employees and their families. The leading article of the first issue describes the extensive task now being undertaken by the railway, of remodeling 560 semi-convertible, double-truck cars of the open platform type into modern vestibule pay-as-you-enter cars, an illustrated account of which was also contained in the ELECTRIC RAILWAY JOURNAL of Aug. 19, 1916.

Railway Participates in Safety-First Parade.—An active part was played by the Nashville Railway & Light Company, Nashville, Tenn., in a "Safety First" parade held in Nashville on Dec. 4. In addition to the display furnished by automobiles in the parade, many of the street railway cars were decorated on the sides with "Safety First" signs and brilliantly illuminated, while other cars were used as floats.

Commission Refuses to Modify Additional Service Order in Lemoyne, Pa.—The Public Service Commission of Pennsylvania in a ruling on Jan. 8 refused a modification of an order in which additional cars on the Harrisburg-Marysville line of the Valley Railways, Lemoyne, Pa., were ordered. The company asked to be relieved of the order because it was declared additional cars were not sufficiently patronized to make them profitable.

Illustrated Safety-First Advertisements in Toledo.—A series of advertisements embodying illustrated talks to automobile drivers has been recently published by the Toledo Railways & Light Company, Toledo, Ohio, in the Toledo newspapers. The illustrations are reproduced from posed photographs showing the common forms of collisions and accidents in Toledo, such as driving past a standing street car, reckless driving on corners, going on the wrong side of the street, careless parking, etc.

More Than Ten Years Without Loss of Life to a Passenger.—The Portland Railway, Light & Power Company, Portland, Ore. calls attention in *Watts Watt*, distributed among its patrons to the fact that not a single passenger has lost his life while riding on one of its cars in the nearly ten years since the company took over the operation of the street railway business in Portland. From Jan. 1, 1907, up to and including Nov. 30, 1916, a period of nine years and eleven months, a total of 810,363,205 persons has been carried.

Jitney Privileges Denied to Minors.—The Public Service Commission of Pennsylvania has refused to grant a certificate of public convenience to operate a jitney to persons under twenty-one years of age. This decision, which will govern in future applications, was made in the cases of applicants from Mifflin and Juniata counties and was reached after an exhaustive inquiry. The applicants had bought an automobile and desired to establish a jitney line, but the commission held that such operators should be twenty-one years of age.

Reprisals Against I. T. S. in Venice.—The City Council of Venice, Ill., on Jan. 5 repealed the ordinances granting franchises to the Illinois Traction Company and instructed the superintendent of streets to notify the company to remove its tracks within five days. The franchises, according to the city attorney, provides for a 5-cent fare from any part of Venice to any part of St. Louis. The company on Dec. 29, under authority from the Interstate Commerce Commission, made the fare 5 cents from the southern limits of Venice and 10 cents from any other part of the town.

Kansas City Railways Making Traffic Study.—Ross W. Harris, consulting engineer of Madison, Wis., whose appointment by the Kansas City Railways to make a study of the traffic conditions there was noted in the ELECTRIC RAILWAY JOURNAL of Dec. 2, 1916, has twenty-eight men employed in making an accurate count of the passengers handled on the various lines, and this count will be continued until the passengers handled on every trip on all lines in the city are recorded. These checkers ride the cars and record the number of off and on passengers at every stop.

Toledo Company Starts Advertising School.—With a view to broadening the knowledge of members of the new business department of the Toledo Railways & Light Company, Toledo, Ohio, a school in advertising has been formed to run through the month of January. Meetings will be held every Monday night, the first on Jan. 8. On this day the men will turn in ads they have written and these will be criticized and suggestions made by E. R. Kelsey, advertising manager of the company. Practical talks from different members of the Toledo Advertising Club will be a feature of the course.

Railroad Commission Asks Rehearing on Jitneys.—The Railroad Commission of California has petitioned the Supreme Court of that State for a rehearing on the court's decision which recently put certain classes of jitney buses and automobile trucks under the commission's jurisdiction. The court is asked to declare the commission's jurisdiction limited to rates and systems of accounts, and to cover only jitney buses and auto trucks which operate as common carriers on regular schedules over public highways between fixed points, one of which points is in a municipality and the other outside the municipality. The commission asks that the court make this declaration either after a rehearing or by a modification of its decision of Dec. 14, 1916.

School Passes Revoked Outside City Limits.—Although the anti-pass law, enacted at the last session of the Kentucky Legislature, became effective on Jan. 1, under the terms of which it had seemed apparent that half-fare privileges now extended to teachers and pupils of the public schools would be curtailed in part, the Louisville (Ky.) Railway will continue to give preferential rates to all pupils and teachers inside the city limits. In the county outside of the city pupils in public and parochial schools will continue to ride for half fare, the law providing for this concession, but pupils in private schools and all teachers in all schools will be required to pay full fare. The concessions are made possible inside the city by provisions in the original charters issued to railways in Louisville.

Conference on Buffalo Fare Case.—Counsel representing the International Railway, Buffalo, N. Y., has agreed to confer with Corporation Counsel Rann regarding the application which will be made by Mr. Rann to the Public Service Commission for an investigation into the rate of fare and charged by the company over its Buffalo city lines. The corporation counsel is making an effort to have the commission order a reduction in fare from 5 cents to 4 cents. It is the desire of the city attorneys to effect a stipulation with the Internationl Railway over the question of having the law settled as to the jurisdiction of the commission in the proposed rate investigation. The company will contend that the commission has no authority in the matter of reducing the rate of fare.

Baltimore Car-Full Measure a Failure.—The Baltimore *Star*, in commenting in its issue of Jan. 5 on the car-full order in that city, said: "Under the car-full rule of the Public Service Commission of Maryland the United Railways & Electric Company was ordered to adhere to a carrying limit for each line of cars, the limit to be fixed by the commission. For several months this rule has been tried and, though there have been efforts on the part of the company to carry it out, it has been found not to have worked successfully under existing conditions. The net result at rush hours, especially during the recent Christmas shopping season, was to force hundreds of people to wait on every downtown street in good weather and bad until cars reached them which were not carrying the maximum number of passengers. This condition was violently protested to the commission by citizens of all sections of the city, and the first real test of the car-full line was virtually pronounced a failure. This through the action of the commission in suspending the order from nearly a week before Christmas until Jan. 1."

Washington & Old Dominion Claims to Be Interstate Carrier.—That the Washington & Old Dominion Railway, Washington, D. C., is an interstate carrier, under the jurisdiction of the Interstate Commerce Commission, is contended in a brief filed with the commission on Dec. 16 by Wilton J. Lambert, general attorney for the company. The brief was filed in connection with a certain case against this company and the Capital Traction Company, involving the question of transfers between the two car lines at Thirty-sixth and M Streets, northwest. The particular point now under consideration by the commission is the question of jurisdiction. It is pointed out in the brief of the company that the line enters Washington over an interstate bridge, has joint and through freight rates with steam railroads, handles express and uses both electricity and steam for locomotion, files its tariffs with the Interstate Commerce Commission and complies with the commission's safety requirements and other regulations. For the above reasons it is contended that the Public Utilities Commission of the District of Columbia cannot be considered to have any jurisdiction over the issues involved in this case regarding the railway.

Street Railway Line Has Right of Way.—The Supreme Court of New Jersey has handed down a decision covering the status of street railways with regard to the State traffic act of 1915 for street vehicles. This measure provides that drivers of vehicles approaching the intersection of a street shall grant the right of way to any vehicle coming from the right. The court holds that such requirement does not apply to motormen on electric railways, reversing a decision of a lower court. The action at issue was brought by a resident of Jersey City for damages against the Public Service Railway. While driving an automobile from an intersecting street east into Monticello Avenue the man who brought suit was struck by a car moving south along such thoroughfare. The lower court decided that the motorman was bound by the provisions of the traffic act and was in error in not giving right of way to the automobile. In reversing this ruling the Supreme Court decided that the traffic measure cannot be held as applicable to street railway lines. It is pointed out that elsewhere in the act drivers of vehicles are directed as to the course to be taken in passing other vehicles, turning corners and, in certain circumstances, veering from one part of the roadway to another. The court said that it is evident that such provisions in the act could not have contemplated street cars, specifically excluding with such considerations electric railway lines.

Hugh M. Wilson Retires

Resigns as First Vice-President of the McGraw Publishing Company Inc.

Hugh M. Wilson, first vice-president of the McGraw Publishing Company Inc., has tendered his resignation and will devote himself to his personal interests. Mr. Wilson has been vice-president of the McGraw company for the past six years, during which time the organization has grown constantly in strength. Two new papers, *Electrical Merchandising* and *The Contractor* have been purchased, *Metallurgical & Chemical Engineering* has been changed from a monthly to a semi-monthly, and the other properties, ELECTRIC RAILWAY JOURNAL, *Electrical World* and *Engineering Record* have made rapid progress.

HUGH M. WILSON

Before joining the McGraw staff, Mr. Wilson had long been a prominent figure in the field of technical journalism, and from 1899 to 1908 was president and chief proprietor of the *Railway Age.* During 1905, the International Railway Congress met at Washington, D. C., and Mr. Wilson offered to publish a daily issue of the *Railway Age* with the papers and a report of each session printed in both French and English. The offer was accepted and the paper was designated as the official journal of the congress. It was a tremendous task from a journalistic standpoint, but through the energy of Mr. Wilson and his staff it was carried out successfully and brought great prestige to the paper and its publishers. In recognition of Mr. Wilson's contribution to the success of the convention through the publication of this daily, he was created a chevalier of the order of Leopold by the King of Belgium.

In 1908 Mr. Wilson sold his interest in the *Railway Age* to the publishers of the *Railroad Gazette,* with which it was consolidated under the name of *Railway Age-Gazette.* At the time of this sale Mr. Wilson also sold his interests in the *Electric Railway Review,* which he had owned for about two years, to the McGraw Publishing Company.

After disposing of these papers Mr. Wilson went abroad for an extended trip and on his return in June, 1909, was elected director and vice-president of the Barney & Smith Car Company of Dayton, Ohio. Mr. Wilson continued with the Barney & Smith Car Company until 1910 and was then elected first vice-president of the McGraw Publishing Company, which position he has just relinquished.

Mr. Wilson's work as a publisher has been marked by his devotion to the highest standards possible, and he has the happy faculty of being able to create in his associates a like enthusiasm and desire to put forth their best efforts. As a writer he combines the qualities of being a keen observer of men and events and ability to express his ideas clearly and convincingly. To these journalistic gifts he added the broad foundation of a long experience in the daily and technical newspaper field. In fact, most of his life, following his graduation from Illinois College in 1887, has been spent in that business.

His first newspaper engagement was as city editor of the Jacksonville (Ill.) *Daily Journal,* but desiring wider experience he went to Minneapolis and accepted a position there as a reporter on the *Evening Star.* That change placed him in touch with the technical journal field, and recognizing its possibilities, he joined the staff of the *Mississippi Valley Lumberman* in 1889. In May, 1891 he changed his desk again to become associate editor of the *Northwestern Railroader* and thus began his career as the railroad journalist. On Sept. 15, 1891, his paper was combined with the *Railway Age,* and he became secretary and treasurer of the consolidated paper. Subsequently he was made manager, and in 1899 he was elected president.

Personal Mention

James Hawson has been elected vice-president of the Trans-St. Mary's Traction Company, Sault Ste. Marie, Ontario.

W. L. Hogarth has been appointed purchasing agent of the Trans-St. Mary's Traction Company, Sault Ste. Marie, Ontario.

G. W. Cook has been appointed engineer of overhead construction of the Central Illinois Public Service Company, Mattoon, Ill.

R. R. Alexander has been elected secretary and treasurer of the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind.

William G. Henshaw has been elected president of the Glendale & Montrose Railway, Glendale, Cal., with office in San Francisco.

Ernest Claxton has been appointed chief engineer and master mechanic of the Fairfax Incline Railroad, with office at Fairfax, Cal.

J. W. Cheney has been appointed claim agent of the Charleston Consolidated Railway & Lighting Company, Charleston, S. C.

G. Stewart has been elected president of the Grand River Valley Railway, Grand Junction, Col., succeeding E. A. Sunderlin, resigned.

Fred Bredlan has been appointed engineer of power station of the Northwestern Ohio Railway & Power Company, at Port Clinton, Ohio.

James Curry has been appointed power station engineer of the West Chester, Kennett & Wilmington Electric Railway, Kennett Square, Pa.

J. H. Brooke, of the schedule department of the Detroit (Mich.) United Railway, has been appointed assistant car accountant of the company.

W. H. Fisher, formerly vice-president of the Chambersburg & Shippensburg Railway, Chambersburg, Pa., has been elected president of the company.

G. M. Simmons has been appointed master mechanic and engineer of overhead construction of the Orange County Traction Company, Newburgh, N. Y.

Henry Gale has been appointed superintendent of the street railway operating department of the Freeport Railway & Light Company, Freeport, Ill.

W. S. Easton has been appointed auditor of the Glendale & Montrose Railway and the Riverside, Rialto & Pacific Railroad, with office at Riverside, Cal.

W. C. Franz, formerly vice-president of the Trans-St. Mary's Traction Company, Sault Ste. Marie, Ontario, has been elected president of the company.

E. J. Andrews has been elected electrical engineer, signal engineer and master mechanic of the Aurora, Plainfield & Joliet Railway, with office at Plainfield, Ill.

R. E. Cornwell has been appointed purchasing agent of the Chicago, Lake Shore & South Bend Railway, Michigan, Ind., and the Southern Michigan Railway.

Edward K. Hall, vice-president of the New England Telephone & Telegraph Company, has been elected a vice-president of the Electric Bond & Share Company, New York.

R. E. Cornwell has been appointed purchasing agent of the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway, with office at South Bend, Ind.

William Hartz has been appointed auditor of the New York & Long Island Traction Company, Long Island City, N. Y., and the Long Island Electric Railway, Long Island City, N. Y.

L. E. Hollar has been appointed superintendent of transportation of the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway, with office at South Bend, Ind.

Julien H. Harvey, superintendent of efficiency of the Kansas City (Mo.) Railways and first president of the Kansas City Local Safety Council, was re-elected president of the Council at the annual meeting on Jan. 8.

Amos A. Betts has been elected a member of the Arizona Corporation Commission. Mr. Betts has had an extensive steam railroad experience dating from 1890. On February 1, 1915, he was appointed rate expert for the Arizona Corporation Commission, which position he held at the time of his present election.

Ray D. Janes has been appointed general claim agent of the Reading Transit & Light Company, Reading, Pa., and affiliated companies, with offices in Reading, Pa., succeeding Rex D. Billings, resigned. Mr. Janes formerly spent six years as assistant claim agent with the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.

Clyde Furlong, formerly assistant superintendent of the Flint division of the Detroit (Mich.) United Railway, has been appointed assistant division superintendent in charge of interurbans within the half-mile circle. Mr. Furlong will have charge of the interurban carhouse in Detroit and will direct the operation of the cars from the interurban station.

William A. House, president of the United Railways & Electric Company, Baltimore, Md., on Jan. 3 was voted an indefinite leave of absence by the board of directors. After a month's rest, Mr. House will inspect the street railway systems in a number of the larger cities with the view of meeting the future requirements of the local Baltimore situation. He sailed on Jan. 11 for Cuba and South America.

Frank H. Miller, superintendent of motive power, and Samuel Riddle, superintendent of transportation, of the Louisville (Ky.) Railway, as Rotarians, were hosts to 150 members of the Louisville Rotary Club which paid a visit to the power house to see "what makes the street car go." Special cars were provided to carry the visitors from downtown and a buffet luncheon was provided at the plant.

William H. Dinsmore has been appointed traffic superintendent for the British Columbia Electric Railway Company, Vancouver, the appointment taking effect on Jan. 1. For nine months previous to this appointment he was acting traffic superintendent. Mr. Dinsmore started with the company on Feb. 1, 1901, as a conductor, and was promoted in 1909 to the position of inspector and in November, 1915, was made chief inspector.

Robert M. Feustel, a member of the firm of Sloan, Huddle, Feustel & Freeman, consulting engineers, has been elected president of the Fort Wayne & Northern Indiana Traction Company to succeed J. M. Barrett, recently resigned. Mr. Feustel was graduated from Purdue University in the civil engineering class of 1905, and after about two years in railroad construction work joined the engineering staff of the Wisconsin Railroad Commission. He later severed his connection with that commission to become a member of the above-mentioned firm.

Thornwell Mullally, formerly assistant to the president of the United Railroads of San Francisco, San Francisco, Cal., has received a special invitation from Major General Pershing to join the Pershing column in Mexico for an indefinite period, during which he will study military field tactics and procedure at close range. Mr. Mullally's status will be that of "military observer." Mr. Mullally is a graduate of Yale University and also of the New York Law School. He devoted himself to law work in New York until 1906, when he went to San Francisco. In his position as assistant to the president he rendered invaluable public service in connection with the reconstruction and reorganization of the city's transportation facilities following the fire.

Frank Hammond, editor of the *Buzzer*, the weekly employees' publication of the Birmingham Railway, Light & Power Company, Birmingham, Ala., has resigned this position to go into the automobile business. Mr. Hammond was born in Greenville, S. C., in 1882. After a grammar school education he was employed at seventeen as shipping clerk with the Charleston & Western Carolina Railway, which position he resigned after two years' service to accept a place as freight clerk with the Carolina Supply Company. In 1903 he obtained a position as bookkeeper with the Standard Oil Company in Birmingham, where he remained for eighteen months, resigning to accept a position as salesman with the Birmingham Railway, Light & Power Company in February, 1905. He was subsequently promoted to the position of chief salesman, assistant commercial manager, commercial manager and general agent, which position he held in addition to his editorial work.

George Tracy Buckingham has been appointed counsel for the Illinois State Public Utilities Commission. Mr. Buckingham is a Chicago attorney, and formerly practised in Danville, Ill., for a number of years. While in Danville he was president and chief owner of the Danville Belt Coal Company, was district attorney for the Wabash Railway Company, and general counsel of the Illinois Coal Operators' Association. He also became interested in the various railway properties which have been comprised in the Illinois Traction System, and was connected with many coal mining properties. He was also assistant state's attorney of Vermilion county and in 1907 was a candidate for justice of the Illinois Supreme Court in the republican convention of that year. Since removing to Chicago Mr. Buckingham served as a trustee of the Kankakee State Hospital for the Insane from 1897 to 1901, and president of the Joliet Prison Board from 1901 to 1905. From 1886 to 1904 he was active in the affairs of the Illinois National Guard and attained the rank of colonel.

Thomas A. Cross, vice-president and general manager of the United Railways & Electric Company, Baltimore, Md., has been appointed in temporary charge of the duties of president in the absence of W. A. House, who has been voted an indefinite leave of absence by the board of directors. Mr. Cross is a native of Baltimore and has been connected with the street railways in that city since a young man. His first work was with the North Avenue Electric Railway, the service of which he entered in 1890. This company was succeeded by the Lake Roland Elevated Railway, and Mr. Cross was advanced until in 1893 he was selected by the Baltimore Traction Company to take charge of its overhead work, motor equipment and power stations. When this company was consolidated with the City & Suburban Railway as the Consolidated Electric Railway Mr. Cross's duties were further increased, and in 1899, when all the lines were merged as the United Railways & Electric Company, Mr. Cross was appointed to the position of superintendent of overhead work, cables, etc. In April, 1907, he was appointed general manager of the company and in May, 1911, he was also elected second vice-president.

Obituary

Sir George White, Bart., one of the pioneers of electric tramways in England, died suddenly at Bristol in November last. He was born in Bristol in 1854, and obtained his early education at St. Michael's Boys' School in that city, but before he had been there long he had to go out into the world to earn his living. In 1874 he was appointed secretary of the company which opened the first tramway line in Bristol, but a year later he started for himself as a stockbroker, and so for a time lost touch with the tramway world. Later his efforts were directed to obtaining control of isolated and semi-derelict railway lines, and consolidating them into main-line systems. About 1893, he and his brother, his partner, secured control of the Imperial Tramways Company, and with Sir Clifton Robinson, who had just returned from the United States, promoted extensions in Dublin and Middlesbrough, where the company owned lines, substituted electricity for horsepower, and completely transformed the company both financially and from the point of view of the passengers' comfort. The Bristol Tramways, of which Sir George was successively secretary, managing director, and chairman, was also developed marvellously. The triumvirate of experts next turned their attention to what was then London's need as far as street traction was concerned. They bought up the West Metropolitan Tramways, reconstructed that undertaking into the London United Tramways, and then, after a long and strenuous fight, extending over years, secured for London the benefit of electric traction, and created a great undertaking, from which Sir George retired in 1903.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

FRANCHISES

Globe, Ariz.—The franchise held by the Globe-Miami Traction Company in Globe has reverted back to the city through the action of the City Council. By the terms of the franchise, L. L. Litchfield, president of the company, will receive $1,500 to reimburse him for money expended to interest capital in the project. [June 19, '15.]

***Los Angeles, Cal.**—It is reported that Henry M. Denison, Los Angeles, has asked the Council for a franchise to construct a double-track electric railway on Main Street from Slauson Avenue to Manchester Avenue.

Hartford, Conn.—The Norwich & Hartford Traction Company has asked the General Assembly for an extension of time to 1921 in which to construct its proposed line between Norwich and Hartford.

Peoria Heights, Ill.—The village of Peoria Heights will give a new franchise to the Peoria Railway in place of the one recently revoked by the Village Council. The village will allow the company to place the tracks on the river side of the road instead of in the center, as they are now.

Wilmette, Ill.—The Chicago, North Shore & Milwaukee Electric Railroad has asked the Council for an indefinite extension of its franchise through the village of Wilmette.

Boston, Mass.—The Boston Elevated Railway has filed a petition with the Public Service Commission asking for an extension of time in which to complete the Everett-Malden elevated line.

Tonawanda, N. Y.—The International Railway has made application to the town board of Tonawanda for permission to construct an extension to its line along the River Road from the Grand Island Ferry road to Tonawanda, about 5 miles. The company now maintains a single track line upon which one car is operated from the Buffalo city line at Riverside Park to the Grand Island Ferry Road, about 1 mile. This line will be rebuilt and if the franchise is granted for the extension along the Niagara River to Tonawanda the company will be able to handle the traffic to and from the large industries now under construction along the Niagara River between the Buffalo city line and Tonawanda. The proposed line has already been surveyed and a hearing on the company's application will be held in Kenmore, N. Y., Jan. 20.

Cincinnati, Ohio.—The street railway committee of the City Council has approved an extension of ten years in the franchise for one of the lines of the Interurban Railway & Terminal Company. The franchises of the company will now all expire at the same time.

Dallas, Tex.—Commissioners of Dallas County, on application of E. P. Turner, representing the Dallas Northwestern Traction Company and the Dallas Southwestern Traction Company, granted extensions of twelve months on the franchises recently secured by these companies. The City Commission of Dallas recently extended the franchises six months, although Mr. Turner at that time asked for extensions of one year. [Dec. 23, '16.]

Vancouver, Wash.—The City Council has pledged to give a franchise to the Columbia River Interstate Bridge Commission to construct tracks from the bridge up Washington Street to Second Street, and from the bridge to Main Street on First Street, and up Main Street to Second Street. The Portland Railway, Light & Power Company is to extend the track on Main Street from Second Street to Third Street and lay a third rail down Third Street to Washington Street and down Washington Street to Second Street, thus making a loop around Third Street for both the North Coast Power Company and also the Portland Railway, Light & Power Company.

TRACK AND ROADWAY

Birmingham (Ala.) Interurban Development Company.—It is reported that arrangements have been completed for financing this company's proposed line from Birmingham to Jasper. W. W. Shortridge, Birmingham, secretary. [June 17, '16.]

Mobile, Volanta & Pensacola Railroad, Mobile, Ala.—This company reports that it will construct a line between Gabel and Elberta, 20 miles.

Fort Smith-Oklahoma Light & Traction Company, Fort Smith, Ark.—This company will construct about 1 mile of track during 1917.

Fresno (Cal.) Interurban Railway.—A report from the Fresno Interurban Railway states that it will construct an extension between Academy and Centerville, 10 miles, during 1917.

Montecito Railroad Company, Los Angeles, Cal.—About 1 mile of new track will be built by the Montecito Railroad during 1917.

Pacific Electric Railway, Los Angeles, Cal.—Condemnation proceedings have been filed at Santa Ana by the Pacific Electric Railway preparatory to the construction of a 5-mile right-of-way from La Habra to Fullerton. In the papers filed the company states that it is the intention to build a line to Riverside through Santa Ana Canyon and to build a branch to Santa Ana from La Habra, one of the points in the proposed Riverside line.

***San Francisco, Cal.**—At the request of local steamship operators, James J. Walsh, San Francisco, has prepared preliminary plans for an elevated electric railway along the waterfront from the Channel to Fort Mason, about 2.8 miles, at an estimated cost of $1,120,000.

Connecticut Company, New Haven, Conn.—Petitions have been filed with the State Secretary by the Connecticut Company for permission to construct extensions in Hartford, Waterbury, Bridgeport, New Haven, Meriden, Cromwell, Norwich and Thomaston.

Shore Line Electric Railway, Norwich, Conn.—It is reported that this company contemplates the construction of a line between Westerly and Bradford.

Georgia Railway & Power Company, Atlanta, Ga.—This company will construct about 6 or 8 miles of new track this year.

Aurora, Mendota & Western Railroad, Aurora, Ill.—Construction will be begun in the spring by the Aurora, Mendota & Western Railroad on its proposed line between Aurora and Mendota. One pile bridge, three concrete bridges and five concrete culverts will be constructed. H. D. Hallet, Aurora, chief engineer. [Dec. 23, '16.]

Chicago, Fox Lake & Northern Electric Railway, Chicago, Ill.—This company has received permission from the Illinois Public Utilities Commission for the construction of an extension from Wauconda to Antioch and to the Wisconsin State line. L. K. Sherman, Chicago, chief engineer. [Dec. 2, '16.]

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—The Board of Public Works has asked the Indianapolis Traction & Terminal Company to construct an extension on Illinois Street from Thirty-ninth Street to Forty-sixth Street.

Western Maryland Railway, Baltimore, Md.—It is reported that the Western Maryland Railway has under consideration the use of electrically-operated trains on its grades over the Blue Ridge Mountains.

***Boothbay, Me.**—It is reported that plans are being made to construct an electric railway from Boothbay to connect with the Lincoln and Knox County branch of the Maine Central Railroad, the cost being estimated at $150,000.

Kansas City, Lawrence & Topeka Electric Railway, Kansas City, Mo.—This company has completed the expenditure of about $20,000 for ballasting and other improvements. It will build immediately 1 mile of track extending the line to Zarah, where a station will be built. The new construction involves a 125-ft. span bridge over Mill Creek, and an overhead crossing over the Santa Fé Railroad, this extension being on the proposed route toward Lawrence, Kan.

Kansas City & Tiffany Springs Railway, Kansas City, Mo.—The Union Mutual Development Company, W. E. Winner, president, which had exploited Tiffany Springs, near Kansas City, and had planned an electric line thereto, is the subject of involuntary bankruptcy proceedings in the Federal Court, the petitioners being the Dwight Building Company, claiming rent due of $585; Mrs. Myra B. Winner, claiming money advanced $1,276.49, and Frances Walton, stenographer, claiming $210. Among the obligations listed in the schedules later filed are about $41,000 in secured notes, bearing on the real-estate project; and $5,892.30 owing variously, including about $800 for engineer's plans and services, and $1,282.71 owing to employees. [Mar. 11, '16.]

New York Municipal Railway Corporation, Brooklyn, N. Y.—The Public Service Commission for the First District of New York has awarded a contract to Lupfer & Remick, Buffalo, N. Y., for the installation of third-rail, track bonding and miscellaneous electrical equipment on the Culver line of the New York Municipal Railway Corporation at $101,000.

Cleveland (Ohio) Railway Company.—Councilman Damm has announced that he will ask for the extension of Wade Park Avenue to East Fifty-fifth Street, in order to reroute the car line on that street over Superior Avenue west from East Fifty-fifth Street. Legislation has been enacted to extend this thoroughfare from East Sixty-first Street to East Sixty-third Street and it is now open between East Fifty-seventh and East Sixty-first Streets. These improvements, with the one to be asked, will straighten the route and make the running time considerably shorter. Councilman W. F. Thompson will ask for the extension of the Union Avenue line from East 112th Street to East 140th Street.

Portsmouth Street Railroad & Light Company, Portsmouth, Ohio.—An extension between Ironton and Hanging Rock, 2 miles, will be built by the Portsmouth Street Railroad & Light Company. All material for the construction has been purchased.

Ardmore (Okla.) Railway.—The Ardmore Railway plans to construct about 30 miles of new line during this year, the extension probably being built northwest from Ardmore.

Oklahoma & Northern Traction Company, Bartlesville, Okla.—W. K. Palmer Engineering Company, Kansas City, has completed the engineering work for the North Division of the Oklahoma & Northern Traction Company system, including 32 miles of track from Columbus, Kan., to Miami, Okla., and a short branch to Baxter Springs, Kan. Construction work will begin soon. Correspondence regarding material and equipment will be handled by the W. K. Palmer Engineering Company. The engineering work on the south division from Miami to Bartlesville, Okla., is also nearing completion and will be ready for construction soon. [Dec. 23, '16.]

Tulsa (Okla.) Traction Company.—The Tulsa Traction Company announces that plans are being formed for installing a street railway system in Tulsa. An interurban line is being projected by the company to extend northward to Collinsville. The company is now building a line from Tulsa to Sapulpa. It is planned to have this line completed and in operation within six weeks.

London & Port Stanley Railway, London, Ont.—The London Railway Commission is considering the construction of 600 ft. of retaining wall to protect the right-of-way in front of the station at Port Stanley from the encroachments of Kettle Creek. The estimated cost of the work is $6,500.

Philadelphia, Pa.—Sealed proposals will be received by the Department of City Transit, Philadelphia, Pa., William S. Twining, Director, for the construction of the following sections of the Delivery Loop Subway with work appurtenant thereto: Contract No. 201—2567 lin. ft. of two-track subway in Arch Street, between Broad Street and Eighth Street including two stations; contract No. 202—2600 lin. ft. of two-track subway in Eighth Street, between Arch Street and Locust Street, including one station; contract No. 203—2600 lin. ft. of two-track subway in Locust Street, between Eighth Street and Broad Street, including two stations. Copies of plans and specifications may be obtained upon deposit of $50, to be refunded upon return of plans.

Quebec Railway, Light & Power Company, Quebec, Que.—This company reports that it will construct an extension from Third Avenue and Fifth Street along the Beauport Road East to the city limits, about 1½ miles.

Charleston-Isle-of-Palms Traction Company, Charleston, S. C.—This company reports that during 1917 it expects to double-track about 1 mile of its Navy Yard line.

Salt Lake & Ogden Railway, Salt Lake City, Utah.—During the next few months the Salt Lake & Ogden Railway plans to construct a second main track between Centerville and Farmington and to connect the double track between Layton and Clearfield. When this is completed the road will be double track all the way to Clearfield, leaving about 8 miles of single track on the whole line. The track between Bountiful and Centerville is to be reballasted and the 60-lb. rail will be replaced by 85-lb. rail.

Virginian Railway, Norfolk, Va.—It is reported that the Virginian Railway is making investigations with a view to the possibility of operating electric locomotives on its line between Elmore and Clarks Gap for the handling of heavy coal trains.

SHOPS AND BUILDINGS

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—An interurban passenger station, a package freight depot and carhouse will be built at Sixth and Clybourn Streets, Milwaukee, by the Chicago, North Shore & Milwaukee Railroad. The company purchased the property, which has a frontage of 270 ft. on Sixth Street and a depth of 150 ft. on Clybourn Street, at a cost of $200,000.

Fort Dodge, Des Moines & Southern Railway, Boone, Iowa.—It is reported that the Fort Dodge, Des Moines & Southern Railway and the Chicago & Northwestern Railway plan to construct a passenger station at Webster City at a cost of about $50,000.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has awarded a contract to the Seventh Avenue Construction Company, New York, for station finish for nine stations on the lower portion of the Seventh Avenue subway between the Battery and Fourteenth Street, inclusive. The contract price for the work is $389,880. Two of the nine stations are express stations. The six remaining stations on this line are already under contract. The Seventh Avenue Construction Company was the lowest bidder for the construction of station finish for six of the stations on the underground portion of the Southern Boulevard and Westchester Avenue extension of the Lexington Avenue subway. This portion of the extension begins under East 138th Street and terminates near Whitlock Avenue and Bancroft Street. Thence to its terminus at Pelham Bay Park the line is an elevated structure. No bids have been taken for stations on the elevated portion of the line.

Oshawa (Ont.) Railway.—It is reported that the Oshawa Railway will soon let contracts for the construction of a carhouse at Oshawa, new rolling stock and other equipment to cost about $100,000.

Eastern Pennsylvania Railways, Pottsville, Pa.—This company's carhouse at Palo Alto was destroyed by fire on Jan. 6, as described in the news department of this issue.

POWER HOUSES AND SUBSTATIONS

Kentucky Traction & Terminal Company, Lexington, Ky.—A program of betterments for the Kentucky Traction & Terminal Company to cost about $200,000 has been announced by S. H. Dailey, general manager of the company. The installation of a new 4000-kw. generator and provision for nine voltage regulators are included.

Toledo Railways & Light Company, Toledo, Ohio.—Work has been begun on the new power house for the Toledo Railways & Light Company on the Maumee River near the center of the city. Contracts have been let to M. V. Kellogg & Company, New York, for two stacks, each 275 ft. high and 16 ft. inside diameter, to be constructed of radial brick.

Philadelphia (Pa.) Rapid Transit Company.—This company plans to reconstruct and extend its power plant on Kensington Avenue, Philadelphia.

Manufactures and Markets

Discussions of Industrial Conditions
A Department for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Business Announcements Trade Literature

Line-Material Orders Indicate Unusual Activity

Reports Considerable Trolley Maintenance Material Business Reported—Prices on Malleable Parts Continue to Rise—Composition Insulation Scarce, but General Manufacturing Situation Improved

E. F. Wickwire, sales manager of the Ohio Brass Company, when recently interviewed by a representative of the ELECTRIC RAILWAY JOURNAL, stated that in normal years trolley material orders are usually scarce in the winter months, but that the inquiries in November and December, 1916, were and still are numerous and that the sales are comparatively large—larger, in fact, than those for ordinary summer months. The material now being ordered is mostly for maintenance and renewal work. Little material is being purchased for extensions or for new lines. The underlying reasons for this condition have been set forth frequently. A remarkable increase in the number of trolley-wire splicers purchased is a definite indication of the plan now being followed by most roads to retain old trolley wire in service just as long as it can possibly be made to do the work.

LABOR AND RAW-MATERIAL SITUATION STILL TENSE

The raw-material price situation continues tense. Prices on malleables, such as are used for line-material manufacture, have been advanced 20 per cent. within the last thirty days, notwithstanding an increase on Jan. 1, 1916, of 30 per cent, and the necessary payment throughout the year of bonuses in order to get deliveries from the foundries. Malleable castings for overhead fittings require special care in making. The ordinary run-of-the-foundry malleable casting is not sufficiently accurate nor are its surfaces smooth enough. Accuracy also is particularly desirable, and to assure uniformity in strength the castings must be properly annealed. In busy times all of these requirements for the malleable foundries mean increased difficulty for the line-material manufacturer, not only to get deliveries but to maintain his standard quality of product. Close supervision of foundry practice and thorough inspection of output are the safeguards used.

Composition insulation, which forms a most important part of insulated hangers, has at times during the past year been the cause of much embarrassment to the line-material manufacturers. For example, one important ingredient in the composition insulation manufactured by the Ohio Brass Company is imported, and in normal times its price ranges from 14 cents up to 18 cents per pound. That material now costs about 40 cents per pound and is difficult to get. Early last year one cargo was entirely lost, and this necessarily interfered with manufacturing progress. The prices of other ingredients in composition insulation have not risen in proportion to those of materials which are imported, but still the prices have advanced substantially and the supply of raw material has been irregular.

The market and delivery conditions on copper and zinc are well known. These, next to the labor situation, have probably during the last year caused the overhead line material manufacturer the most trouble. As an illustration of the problems met in the labor end of the manufacturing business, Mr. Wickwire cited an example of one workman and said that this was typical of many. This man was employed in March, 1916, as a common laborer at 17 cents per hour. He was a green foreigner. In April he was raised to 20 cents per hour, and in May he had become broken in to do certain jobs and was raised to 25 cents per hour. A few months later a munition job appealed to him, and he suddenly left to get 30 cents per hour. He was typical of a class that had been taught to do certain work and therefore was more valuable on account of his experience than a new man could possibly be for some time. Hence, the company had to hire him back at still greater wages in order to avoid breaking in a new man.

The raw-material situation, Mr. Wickwire said, is gradually being relieved as manufacturers are catching up with their large orders. The production problem is now fitted to a schedule. It proceeds regularly except when special designs are ordered. Then, when new patterns are required and only small lots are to be made, it is difficult first to get the patterns made, then to get them started through the foundry. Later the special job has to be forced into the shop schedule where large standard lots are commanding the tool equipment. Now more than ever does standardization mean much to the manufacturer as well as to the railway.

J. G. Buehler Discusses Car Equipment and Tool Specialties

Increased Production, Careful Handling of Labor Problems, and Large Reserve Supply of Raw Materials Are the Only Factors Which Will Prevent Further Advance in Prices

J. G. Buehler, president of the Columbia Machine Works & Malleable Iron Company, Brooklyn, N. Y., when interviewed recently by a representative of the ELECTRIC RAILWAY JOURNAL, reported that orders for accessories, such as forgings, brake-rigging repairs, armature and field coils, brushholders, armature and axle bearings and electrical repair tools, which have long been delayed, are being received regularly. Although no exceedingly large individual orders have been placed, with one or two exceptions, the aggregate of all the orders is considerable. Furthermore, the prospects are that orders for the next three months will total even more than those placed for the same period previous to this time.

PROMPT DELIVERIES BEING MADE

This company has been particularly fortunate in being able to make prompt deliveries. This has been due directly to the fact that a large reserve supply of raw materials was obtained before prices were forced up by the present crisis, which has been particularly acute in the material and labor markets during the last nine months. With the possible exception of orders which required large amounts of brass and copper tubing, brass sheets and magnet wire, no difficulty has been experienced from a shortage of raw materials, and in these cases the materials were obtained practically regardless of cost in order that the product might be supplied without too great a delay to the purchaser. With the exception of malleable castings, on which about three months' delivery is required, nearly all orders have been delivered promptly, and to quote Mr. Buehler, "Not more than a dozen letters have been received complaining of not having received deliveries on the dates promised."

As a considerable percentage of the business consists of repair parts, including motor axle bearings, brushholders, brake pins, third-rail contact shoes and iron and brass forgings of different kinds, about $50,000 worth of repair parts are kept in stock. In addition, complete stocks of patterns, dies, jigs and drilling templets (75 per cent of all of the patterns, etc., being for repair parts) enable the company to make exceedingly quick deliveries. Patterns and dies (some of which cost $500 a set) are seldom destroyed, and if an order is obtained but once in two years, it is cheaper to keep the dies on hand than to try and reproduce them. The advantage of keeping on hand these large stocks of patterns and dies, which are said to represent an investment of more than $100,000, is evident. In case of a breakdown, due to the failure of a casting or forging in a company's equipment, it is imperative that the repair be made quickly. An order for a new casting is usually phoned in or the broken part is received by express. The pattern is then taken from the shelf and put in the sand, the mold is poured and the casting is machined and shipped by express to the customer the next day. This applies to almost any type of casting, as the company has its own gray iron shop, brass foundry, sheet-iron shop, machine shop, forge shop, pattern shop and foundry, and maintains a considerable night force. By this procedure a large volume of emergency repair business has been obtained. On the other hand, these repair jobs are expensive, and if time permits a near-by purchaser will often place his order with a manufacturer in a distant town where the cost of labor is considerably less and where raw material can be more readily obtained.

LABOR PROBLEMS DIFFICULT

The most serious problem which this company has had to confront is that of skilled labor. Although wage increases of from 15 to 25 per cent have been made throughout the plant, machinists, tool makers, molders, sheet-iron workers, etc., have been exceedingly hard to keep. As an incentive to the men to make more money, a bonus system was placed in operation, and this has not only increased production but has helped materially in making better deliveries. In addition to the bonus system, the foremen in the plant, and all of the office help, clerks in the shipping department, etc., received an extra month's salary at Christmas, and a present was made to every man on the payroll of a $5 gold piece.

TIGHT MONEY MEANS HIGH PRICES

A large reserve supply of raw materials, careful handling of labor and increased efficiency in shop methods are the factors which are working against a further advance in prices. Some of the manufacturers are fortunate in having immense stocks of raw materials, and these are invariably the last to increase prices. Payments for purchases of raw material by manufacturers from the mills and factories are now quoted at thirty days net, where formerly sixty to ninety days could be obtained. This has caused inconvenience to some manufacturers, as in many cases production has more than tripled in the last two years, and it is necessary for the manufacturers to borrow money from the bank or have an immense outlay. In some lines, when the mills tighten up on the manufacturer, he in turn requires prompt payment from the customer or jobber, but this rule hardly applies where the customers are all railways, because they discount their bills promptly.

Steam Roads Show Big Gains

Small Mileage Increase but Equipment Ordered Exceeds That for Any Year Since 1912, Earnings Per Mile Exceed Previous High Record

The year 1916 has been one of record-breaking traffic and earnings for the railways of the United States. This fact is well known to the manufacturing as well as the operating side of the electric railway industry and therefore the following statistics, gathered by the *Railway Age Gazette*, will be of interest.

The mileage of new steam railroad track built during 1916 was 1098 miles. In 1915, only 933 miles were built, this having been the smallest amount of new construction in any year since the Civil War. The largest amount of new construction was in Montana, where 99 miles of railway were built; South Carolina being second with 92 miles, and California third with 78 miles. New construction in Canada shows a heavy decline. The new mileage found to be projected in the United States is 727; that being surveyed, 2126 miles; and that being actually built, 1060 miles.

The increase in the purchase of new steam road equipment was much greater relatively than the increase in new construction. The following table gives the number of cars and locomotives ordered by the steam railways of the United States within the last three years:

	1916	1915	1914
Freight cars ordered	170,000	107,796	80,264
Passenger cars ordered	2,349	3,092	2,002
Locomotives ordered	2,923	1,573	1,265

The number of freight cars ordered for domestic service is larger than in any year since 1912, and the number of locomotives ordered for domestic service is larger than in either 1914 or 1915. The number of freight cars ordered for export was 25,632, as compared with 13,222 in 1915; and the number of locomotives ordered for export was 2983, as compared with 850 in 1915.

The year closes with sixty-three railways having an aggregate of 34,559 miles of line in the hands of receivers. This compares with a mileage of 38,661 which was in the hands of receivers at the beginning of 1916.

The total mileage of railways operated under the block system at the end of the year is 99,885. Of this, 32,978 miles is automatic, an increase of 1818 miles.

In the five years ending with 1906 the total number of freight cars ordered was almost 1,100,000, or an average of over 218,000 a year. In the five years ending with 1916 the number ordered has been only about 740,000, an average of about 148,000 a year.

The foregoing statistics set forth in a startling manner one of the most important facts to be considered in connection with the present situation of the railways. The car shortage and traffic congestion of 1906 came at the end of a decade during which there had been a great expansion of transportation facilities, while the car shortage and congestion of traffic in 1916 have followed immediately on the heels of a long period of depression during which the increase of facilities has been relatively small. Since steam railway facilities have proved inadequate at the beginning of the present period of prosperity, what kind of a situation will it cause to develop if industry steadily grows more active and traffic heavier, as it did for several years prior to 1906?

The net operating income of the steam railways during the year just closing has been unprecedented, probably averaging more than 6 per cent on the investment in road and equipment. Until within the last eighteen months average gross earnings per mile per month had exceeded $1,300 in only one month, October, 1912. In August and September, 1916, all previous records were broken with earnings of $1,418 and $1,409 per mile.

General Business Conditions

General Feeling of Optimism for Future, Except in Sections Having Poor Crops

The general business conditions throughout this country near the end of 1916, as reported by the committee on statistics and accounts of the Chamber of Commerce of the United States, are good, as may be judged from the accompanying chart. Although optimism is the general feeling, there are some sharp exceptions to this in those sections where the crops are poor, but on the whole the showing is much better than that made last year, as indicated by a sim-

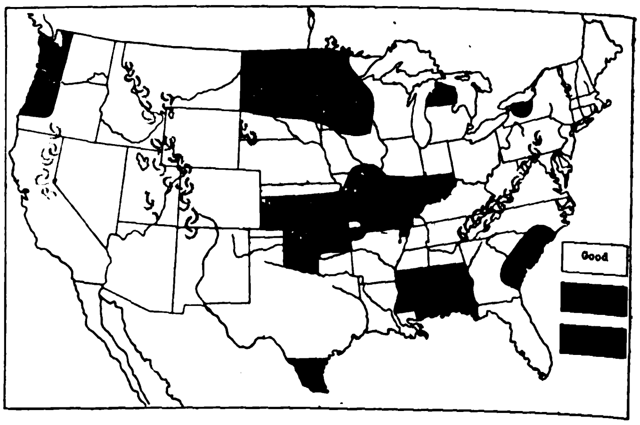


CHART SHOWING BUSINESS CONDITIONS IN THE UNITED STATES AS OF DEC. 2, 1916 ilar chart in the Electric Railway Journal of Jan. 15, 1916, page 127.

At the present time, it is said, there is little apparent fear of there being in the near future that readjustment which it is generally believed will come with peace in Europe. There is concern in some sections, however, as to the probable effect upon demand of the present high prices, and especially if they should increase.

ROLLING STOCK

Geneva, Seneca Falls & Auburn Railroad, Waterloo, N. Y., is reported to be in the market for two cars to be used on its Geneva city lines.

Eastern Pennsylvania Railways, Pottsville, Pa., lost twenty open and service type cars on Jan. 6 in a fire which destroyed its Palo Alto carhouses.

Illinois Traction System, Peoria, Ill., is having the following cars built by the American Car & Foundry Company: 100 box cars, 60 hopper-bottom coal cars and 40 flat-bottom gondolas. In addition, the company has received a snow-plow from the McGuire-Cummings Manufacturing Company.

International Railway Company, Buffalo, N. Y., has awarded a contract to the Kuhlman Car Company of Cleveland, Ohio, for rebuilding twenty old-type cars. In addition, ten old cars are being rebuilt in the company's Cold Spring car shops. They are being equipped with new vestibules, folding steps, cross-seats, etc.

East St. Louis & Suburban Railway, East St. Louis, Ill., noted in the Electric Railway Journal of Dec. 16, 1916, as expecting to rebuild five closed motor cars, have ordered these from the American Car Company, and have specified the following details for this equipment:

Seating capacity	44
Weight (car body only)	16,000 lb.
Bolster centers, length	22 ft. 4 in.
Length of body	31 ft. 8 in.
Over vestibule	46 ft. 4 in.
Width over sills	8 ft. 6 in.
Body, wood or metal	Metal
Interior trim	Agasote
Headlining	Agasote
Roof, type	Arched
Underframe	Metal
Air brakes	General Electric
Axles	American Car
Bumpers	Hedley Anti-climbers
Cables	Westinghouse
Car trimmings	American Car
Control type	GE. PC. Westinghouse K36J Double end
Window fixtures	American Car
Destination signs	Hunter Illuminated
Curtain material	Pantasote
Door operating mechanism	American Car
Gears and pinions	GE Grade M Westinghouse
Hand brakes	Adams & Westlake, No. 46 staff
Heaters	Peter Smith Electric
Journal boxes	American Car
Motors, type and number	2 West. 532-B
Motors	Outside hung
Registers	Ohmer
Sanders	Leach Locotype air
Sash fixtures	American Car
Seats, style	Hale & Kilburn Walkover
Seating material	Rattan
Step treads	Feralin safety
Trolley base	Peerless
Wheels	Davis cast steel

TRADE NOTES

McQuay-Norris Manufacturing Company, St. Louis, Mo., announces that three mechanical engineers—H. C. Coleman, Carl E. Finch and H. R. Souther—have been added to its sales force in the field.

Automatic Ventilator Company, New York, N. Y., has been appointed exclusive sales agent in the State of Ohio for the sale of the "Flower" brush holder, air handles, controller handles, etc., by the manufacturer, D. B. Flower of Philadelphia, Pa.

Johnson Fare Box Company, Chicago, Ill., through its Eastern agent, the U. S. Metal Manufacturing Company, has received an order for thirty-five Johnson fare boxes from the Maryland Electric Railways and one for 210 Johnson fare boxes from the United Railways & Electric Company, Baltimore, Md.

Ohio Brass Company, Mansfield, Ohio, is assignee of patent No. 1,209,742 dated Dec. 26, 1916, covering a method of bonding rails. The bond is formed of a plurality of members having the ends encircled by a sleeve of steel or iron to form a terminal which is united to the rail by heating the bond ends and the rail with a gas flame and applying the attaching metal integrally to the heated parts.

Horne Manufacturing Company, Brooklyn, N. Y., announces that as an adjunct to the Lord Manufacturing Company's products which have been acquired recently, it has arranged to take over the railway output of the Channel Packing & Rubber Company, New York, N. Y., and is now in a position to supply air brake hose and rubber hose of all kinds, "Wedgeset" cylinder and piston packing and "Marvel" sheet packing, gaskets, etc.

Presto-O-Lite Company, Inc., Indianapolis, Ind., announces the organization of its many activities in the railway field into a separate and distinctive department of railway sales and service, in charge of Stanley D. Winger, manager of railway sales and service. This places at the disposal of the electric railways a corps of specialists on oxy-acetylene welding and cutting, brazing, lighting and the many other forms of acetylene service.

Edward N. Hurley of Chicago, who was appointed a member of the Federal Trade Commission at the time of the formation of the commission, two years ago, and who for the last year has been the chairman of the commission, has resigned that office in order to resume his business connections in Chicago as presiding officer of the Hurley Machine Company and other corporations in which he is interested.

H. W. Johns-Manville Company, Cleveland, Ohio, has opened a new office at 911 Walnut Street, Des Moines, Iowa, thus bringing the total number of its branches up to fifty-five. William B. Roberts, who has been with this organization for a number of years in the Iowa district, has been appointed manager of the new office, and will have under him a corps of salesmen and construction men which will enable the company to give the highest class of service.

Van Dorn Coupler Company, Chicago, Ill., reports that it has received within the last few weeks a number of coupler orders, which include the following: J. G. Brill Company, for the cars of the United Railway & Electric Company, Baltimore, Md., 200; Brooklyn Rapid Transit Company, 450; Western Wheeled Scraper Company, 10, and Chicago Elevated Railways, 100. The types of couplers ordered vary from the small link-and-pin to the heavy interurban M. C. B. type. The Brooklyn and Chicago Elevated orders call for both motor car and trailer car types.

Samuel G. Hibben, formerly head of the engineering department of the Macbeth-Evans Glass Company, Pittsburgh, Pa., and associated with the Westinghouse Electric & Manufacturing Company, has recently become identified with the Westinghouse Lamp Company. Mr. Hibben is well known in the several electrical and engineering organizations, and particularly for his activities in the Illuminating Engineering Society, being chairman of the Pittsburgh section. He has also been engaged in consulting work in the lighting of a number of large buildings. Mr. Hibben will continue in engineering work and will make his headquarters at the Pittsburgh office.

Ohmer Fare Register Company, Dayton, Ohio, reports that a decision was handed down on Dec. 15, 1916, by the United States Circuit Court of Appeals in a suit for infringement brought by the company against the Recording & Computing Machine Company of Ohio, the Dayton Fare Recorder Company of Ohio, and the Dayton Fare Recorder Company of Washington, D. C. The court found that the defendants had infringed claims, 4, 6 and 13 of patent No. 646,757, issued April 3, 1900, to John F. Ohmer, relating to improvements in multiple fare recorders. As stated in the specification of this patent, "in a broad sense the improvements comprise mechanism by means of which printed statements, impressions, or records of the different classifications of fares, of the month and day of the different trips, and of the number of the register may be taken on a single sheet and by a single operation."

ADVERTISING LITERATURE

Rowan Electric Manufacturing Company, Inc., of Baltimore, Md., has prepared a loose-leaf booklet on its Automatic Protective and Control Devices for Electric Motors.

Metropolitan Engineering Company, Brooklyn, N. Y., has issued a bulletin on "Cable Failures and the Remedy." This bulletin contains a detailed description of an oil-filled cable joint, which is used on cables carrying up to 16,000 volts.

Stromberg-Carlson Telephone Manufacturing Company, Chicago, Ill., has issued a pamphlet on its new test set No. 844. This set is a complete telephone in every respect, including in its equipment, transmitter, receiver, generator, hook switch and battery.

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ELECTRIC RAILROADING IN THE ORIENT

If an American should suddenly be transported to an oriental city he would find conditions very different from those at home as regards dress, customs and housing and social conditions; in fact, in nearly everything which goes to make up the daily life of the individual. Almost the only familiar object would be the trolley car. It is perhaps because electric traction is so recent in origin, or it may be because Americans have taken such an active part in the financing and operation of these lines, but it is a fact that electric railway practice does not differ very much wherever it is found in all parts of the globe. The needs for transportation are omnipresent wherever the community; and the electric railway is necessary even where jinrikishas and sedan chairs abound. So much of the apparatus comes from America or is made along American lines and the industry has developed to such a greater extent in this country than elsewhere that it is not surprising to find American transportation practice followed so far as it is not inconsistent with local operating conditions. In view of these facts, we believe that our readers will be interested in the interview in this issue with C. Nesbit Duffy, vice-president Manila Electric Railroad & Light Corporation, who has a wide first-hand acquaintance with both oriental and American railway conditions.

ORIENTAL AND AMERICAN RIDING

Although the riding and receipts per capita, and consequently the trackage of the system, are not as large in an oriental city as in a city of corresponding size in this country, they are by no means so much less as one might possibly assume. Thus, in Manila, while the rides per capita per year on the railway are only about fifty, it should be remembered that much of the travelling is done by other conveyances, as described by Mr. Duffy. When to the receipts of the railway are added the receipts from these other means, it will be seen that the expenditures rise from, say, $1.50 to about $6 per year per capita for urban transportation in public conveyances. In explanation, it must be remembered that while the per capita wealth of an oriental city is not large, the climate is such as to stimulate riding, and many cities of considerable population cover a large area on account of the absence of tall buildings. Altogether, the receipts per mile of track, as determined by the figures given in the interview, are about $10,000, not a bad showing. From an operating standpoint difficulties and expenses are undoubtedly met in any city so far away from the source of supply, but the lower cost of platform labor should tend to balance the higher material expenses in the operating report. It is interesting to note that Mr. Duffy reports that private automobile competition, from which the railways in this country have suffered, is felt even in Manila.

WARNING AUTOMOBILE DRIVERS

In an effort to co-operate with steam railroads to secure a decrease in grade-crossing accidents, Secretary of State Hugo is mailing out 400,000 "safety-first" pamphlets with the 1917 certificates of registration for New York autoists. These folders, which are furnished by the railroads, direct attention to the increasingly serious character of the grade-crossing problem and urge each motorist to observe more strictly all warning signs. Some autoists, like those whom the Long Island Railroad has found recklessly smashing through safety gates, will probably cast the warning aside with a sneer. The foolhardy, without doubt, can only be completely protected by compulsory means or by threat of heavy penalties. We imagine, however, that the average autoist will be impressed with the apparently official character and personal application of the warning and will bear it in mind at least for a time. At any rate, another move has been made by common carriers to extend the safety-first movement, and thus to lessen the number of unused means by which there is any chance of automobile drivers being brought to a realization of their responsibility for safe operation.

THE LABOR PROBLEM AND EXECUTIVES

We have been much impressed by a recent remark of John D. Rockefeller, Jr., in regard to the modern executive. According to a statement made by him on Founder's Day at Cornell University, the chief executives of important industrial corporations have heretofore been selected largely because of their capacity as organizers or financiers. In his opinion, however, the time is rapidly coming when the important qualification for such positions will be a man's ability to deal successfully and amicably with labor. We firmly believe that this holds true just as much for electric railway executives as for industrial leaders. The day is passing, if it has not gone already, when an electric railway executive can subordinate the labor question to all others and deliberate on it only when he is compelled to do so through the outbreak of industrial trouble. The electric railway industry is confronted now, and will be more seriously confronted in the future, with the difficult tasks of fixing wages on a more scientific basis, of solving the complex questions of proper hours of labor, of seeing that the public right to uninterrupted service is respected and of trying in general to direct social legislation along sane lines. Electric railway executives must give careful thought to these subjects, for the industry can ill afford to depend on men in other fields to do its thinking for it in order to determine the proper course to follow. The labor problem is nothing more or less than a human problem—the bringing of men with muscle into amicable relationship with men of money for their mutual betterment—but it is a most important one. The electric railway executive will be best suited for his position who realizes to the greatest extent the need of constructive and lasting policies in handling such a problem.

REGENERATIVE BRAKING FOR CITY SERVICE

The fact that stands out most strongly in R. E. Hellmund's remarkably comprehensive treatise on regenerative braking, which was read before the Institute of Electrical Engineers last week and is abstracted on another page of this issue, is that there is an almost infinite number of ways to produce the desired result. In fact, the list of possible systems submitted by Mr. Hellmund for effecting regeneration with direct-current motors alone is fairly bewildering, and one can hardly avoid wonder at the thought of the almost insignificant extent to which the principles have been commercialized at present.

In the discussion that followed Mr. Hellmund's address, the consensus of opinion seemed to be that this present limited number of practical applications is due solely to a lack of refinement in motor design in the past, and one is left with the more or less definite impression that regenerative braking is expected soon to become practically universal. There is, no doubt, reason for much enthusiasm on the subject since the operations on both the Norfolk & Western and Chicago, Milwaukee & St. Paul installations have been such an unqualified success. Yet it is a long cry from these two applications (which, with the addition of a single locomotive on the Lake Erie & Northern Railway and the three-phase engines on the Cascade Tunnel, constitute the only ones in this country) to the use of the principle on the motor cars of city and interurban railways.

Any such adaptation must, of necessity, be of the direct-current type, and direct-current regenerative systems seem to suffer inherently from the complication of separate excitation, this being necessary because of the instability of the universally-used series motor when it is operated alone as a series generator. Simplicity, of course, is of far-reaching importance to motor-car equipment. Indeed, simplicity that can keep at a minimum the vital factors of first cost and maintenance (to say nothing of liability to breakdown) is almost priceless. Complication, apparently, cannot survive, even when relatively great returns or important operating flexibility accompany it, as witnessed by the failure of the really wonderful engineering conception of combined a.c.-d.c. apparatus to perpetuate itself in interurban service.

Of course, the idea of regenerative braking for city cars opens up a marvelous vista of possibilities. Given the hypothesis that complication of apparatus may be altogether neglected, it is unquestionably possible, with a negative booster and regenerative control, to brake down to zero speed and to return practically all of the kinetic energy of the car to the line at every stop. It would then be possible on a large city system to save something like 60 per cent of the power originally used, and to effect an economy amounting roughly to $1,000 per car per year, because in normal city service practically two-thirds of the energy is devoted to acceleration, only to be dissipated immediately afterward at the brake shoes.

Regenerative braking for city cars, in brief, would furnish another answer to the old problem of horse-car days wherein a means was sought by thousands of inventors to eliminate the large effort required of horses when starting a car. The problem to-day is no different except, perhaps, that the pot of gold at the rainbow's end has grown to many times its original size. Then, as now, a remedy for the waste of energy is obvious enough if one neglects the element of complication. But since this is something that cannot well be done in actual practice, we feel that only a conservative attitude may properly be taken, and that any application of regenerative control for motor cars should be preceded by a long and elaborate series of service tests.

BETTER PAY FOR THE MASTER MECHANIC

We have been planning for some time to say a word or two on behalf of a group of men most essential to the prosperity of the electric railway who are by the nature of their work in a difficult position when increases in salary are in question. To come right to the point we think that the master mechanics are, on the average, underpaid, but we have hesitated to say so while so many influences were at work to drain the electric railway's resources. However, we must face the fact that with the increasing complexity of equipment and the necessity for economy in maintenance good men must be held in this class of work and better men developed for it. To this end reasonable pay is necessary, and prospect of ultimate promotion to other departments is desirable. There is no doubt that good work in the shop is appreciated higher up, but the appreciation in many cases does not take the form of cash.

The position of master mechanic in these days calls not only for a high grade of intelligence and all round experience, but there must also be executive ability of no mean order. There was a time, not far back, when almost any good mechanic of foreman timber could be put in charge of rolling stock and its equipment. This time has now passed, but the tradition that the master mechanic should receive a mechanic's wages has not altogether disappeared. The name of the job, honorable as it is, rather tends to continue the tradition. In the wage-drawing ranks of the electric railway there has been a more or less steady rise in wages to meet the increasing cost of living. This is necessary to keep the men contented and to meet competition. It is reasonable to expect that the men higher up should be similarly advanced even if they do not assert their rights or threaten to leave their posts for more lucrative positions.

THE PASSING OF A GREAT ENGINEER

The untimely death, on Monday last, of Henry Gordon Stott, superintendent of motive power of the Interborough Rapid Transit Company, removed from the ranks of the engineering profession one of its most useful and eminent members. His technical achievements form an imposing array, so much more extensive were they than it falls to the lot of most successful men to accomplish. Such results could not have been produced by an ordinary man, which he was not in any aspect of his character and acquirements.

Mr. Stott was a natural leader in administrative affairs, as well as technical ones. Although retiring in disposition rather than otherwise, he somehow was obliged to assume positions of responsibility and influence in any organization to which he was attracted by the possibility of rendering himself useful. He had no patience with societies or individuals which were accomplishing no worthy purpose, but unsparingly gave himself to any project, however difficult, which appealed to him as worth while. His counsel was sought because he treated every question as a problem to be solved in the scientific spirit—that is, with sincerity of purpose, broadness of vision and thorough attention to detail. He believed thoroughly in analysis as the basis of progress.

As a place for the training of young engineers the motive power department of the Interborough was a veritable school for post-graduate work. One element in Mr. Stott's success was his ability to attract, train and enthuse a group of assistants able and eager to carry out his technical ideas. His requirements were severe, as he expected deeds not words, but once he found a man with the right attitude toward work and life in general there were no limits to his ambitions for that man. From his assistants he insisted upon having correct results but was always reasonable in his demands, and made all possible allowance for the limitations imposed by the state of the art, by the experience of the investigator and by the facilities at the disposal of the latter. When results of value to the profession were secured, the man responsible for them was encouraged to incorporate them in technical papers for presentation before the appropriate national or other societies.

That Mr. Stott was a mechanical engineer in a very broad sense is indicated by his interest also in electrical and civil engineering. He was recognized as an authority in all three engineering branches. This was natural, in view of the fact that in attacking problems he insisted upon going to their root. Railway men may well feel pride in the fact that he was one of their number.

IMPROVING THROUGH SERVICE

The improvement of through interurban service is essential in some competitive districts if the volume of traffic is to be increased to a point yielding larger net revenue. No general indictment is intended, but a few observations derived from a recent attempt in the East to make an interstate journey of between 200 and 300 miles by trolley are pertinent. In a nutshell, the betterments which seem desirable chiefly have to do with raising the schedule speed (not the maximum speed) and with the articulation of connections at the terminals of individual car service so that long waits are avoided under normal conditions.

A limited-stop service in entering and leaving large cities en route appears essential to the best results. Efforts to carry on a local business with through and fast interurban cars operated for a few miles on large urban traction systems are apt to militate against a satisfactory inter-city journey. What might be called a preferential right-of-way should be given to the interurban cars wherever possible. The use of electric track switches at important junctions passed over by such cars, the discouragement of purely local patronage and the clearing of the line in front of such movements when feasible, as in the holding back of service cars, coal and express matter from obstructing the through unit, are important. Often it is possible virtually to clear a line for through service considerably in advance of the scheduled passing points and without skimping on the local facilities. Those extra quarter hours mean a great deal when the electric road is trying to compete for business with parallel steam lines.

Circuitous entrances into cities for the purpose of getting local business on interurban cars result in saving pennies but in losing dollars, except in those where there is no competition. On a line where forty-five minutes of a two-hour trip between terminals 40 miles apart is consumed in entering and leaving the two principal cities concerned, it is hard to reap the full benefits of the interurban section of the trip, in competition with a parallel steam service covering the distance in an hour, even although the steam fare is double that on the electric, or nearly so. If, by keen study of the terminal situation, from fifteen to thirty minutes can be cut off the trip, the resulting schedule is sure to appeal to business men more than the longer running time quoted above. The extra 50 cents does not measure the value of a busy man's hour in the middle of the day. Finally, the practice of routing incoming through cars slowly around a central park or common before allowing the passenger to reach the principal transfer points is of doubtful benefit. It would seem almost axiomatic that as short an entrance as is consistent with good service should be made into a terminal city and that connections of through cars on trunk lines should be planned with due regard to the possibilities of rapid through service.

Old Cars Remodeled at Portland, Me.

The Cumberland County Power & Light Company Is Converting Its Old City Cars for Prepayment Service with Installation of Folding Doors and Steps—The Work is Being Handled at the Company's Shops Without Additional Facilities

AT the present time the Cumberland County Power & Light Company, Portland, Me., is reconstructing its old city cars for prepayment service, including the removal of bulkheads and the installation of folding steps and doors with manual control, so as to provide them with thoroughly modern facilities. Concerned in the change are six single-truck cars with 20-ft. bodies and fourteen double-truck units with 28-ft. bodies. These cars are of the box type, with longitudinal seats, and before alteration they were equipped with fixed steps and interior bulkheads. In addition, two semi-convertible cars of somewhat more modern type have been included in the job. All of these cars are being equipped with combined fare boxes and registers, so placed as to permit pay-within operation.

No specifications or drawings for the job have had to be prepared by the railway company, since the manufacturers of the folding door and step mechanism have been held responsible for measurements, the standard drawings of the latter being filled in from field data secured at Portland and used by the reconstruction force of the railway company in installing the control stands, levers and fittings. The manufacturer ships rods and fittings built for specific cars in stenciled boxes, so that when the parts arrive at Portland their application to the right rolling stock units is assured without delay.

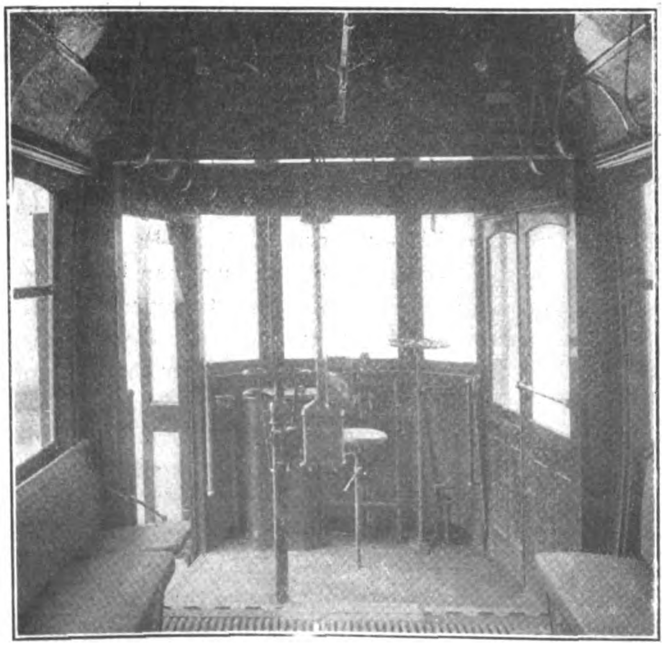
Work was begun on the job at the St. John Street shops in Portland on Oct. 4, 1916, and at present it is about half done. On account of maintenance work on other rolling stock, the reconstruction has had to be temporarily slowed down or suspended at times, the company considering it inadvisable to concentrate a specialized force on work of such limited extent.

In the case of the single-truck cars with 20-ft. bodies, which are representative, the bulkhead door was 21¾ in. wide in the clear before reconstruction, and on these smaller cars the bulkheads have not been wholly removed, but have been cut down to a height of 3 ft. 6 in., the width of the passage into the car from the vestibule being increased to 27½ in. This leaves in place a section of the bulkhead 18½ in. wide on each side of the passage, which affords an arm rest 4½ in. wide at the top.

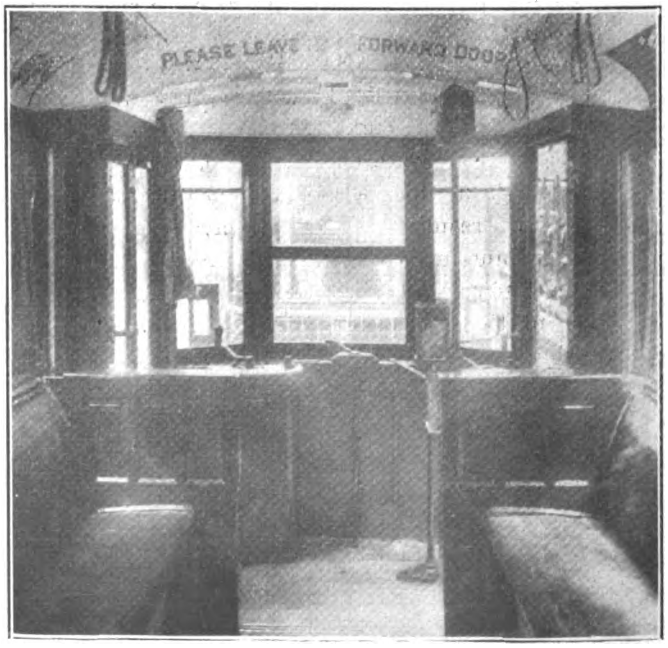
One of the accompanying illustrations is an interior view showing the "set-up" of one of these cars for one-man service, and although no immediate plans for the operation of one-man cars have been announced at Portland, these remodeled 20-ft. cars can readily be so used if necessary. As shown in an accompanying illustration, the fare box is mounted just behind the right-hand forward bulkhead for one-man operation, the entering passengers passing between the motorman and the box. The motorman controls the entrance door, which is shown open in this view, from an operating handle at the right of the controller.

With two-man operation this door is, of course, used as an exit that is controlled by the motorman, the fare box being located at the other end of the car in a location corresponding exactly to that shown in the illustration. In the latter case the conductor stands between the fare box and the nearer door, which is closed, and passengers enter via the door shown at the left, this being controlled from an operating stand just behind the right-hand bulkhead. The doors are operated in synchronism with the steps below them on all the cars involved in the job. The fare box, which is of International Register Company's make in all cases, is carried 2 ft. 10 in. above the platform.

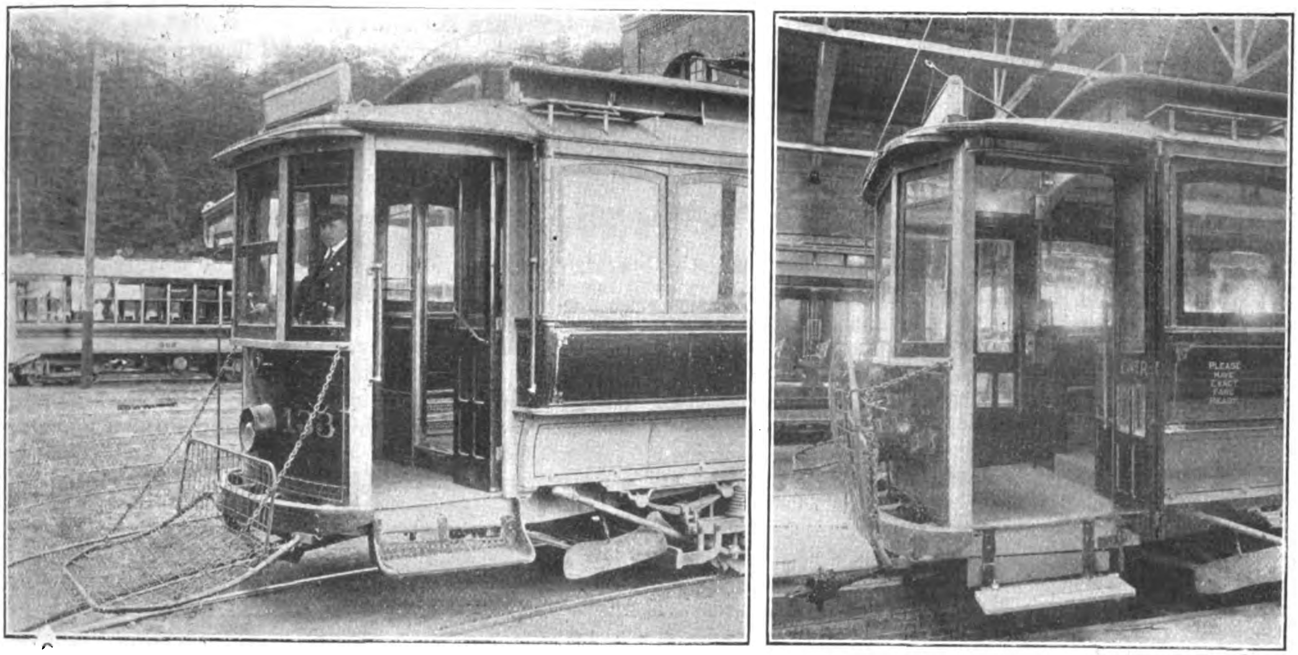
The doors of the single-truck cars are in two sections, the inside section being guided by a case-hardened steel roller, and the doors are arranged to fold outward and hang on 1-in. round steel rods. The outside door opening is 35 in., and the steps are each 2 ft. 7½



REMODELED PORTLAND CARS—INTERIOR OF RECONSTRUCTED SEMI-CONVERTIBLE CAR



REMODELED PORTLAND CARS—INTERIOR OF SINGLE-TRUCK CAR BODY AFTER RECONSTRUCTION



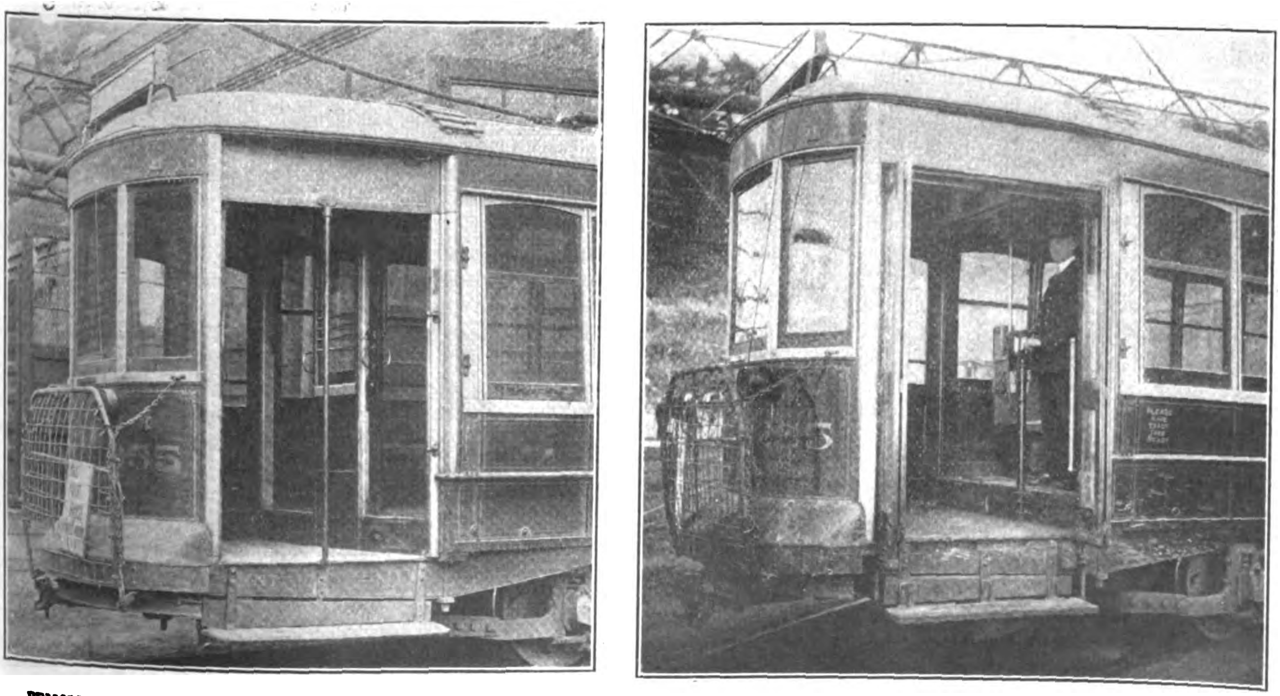
REMODELED PORTLAND CARS—VESTIBULE OF SINGLE-TRUCK CAR BEFORE AND AFTER REMODELING

in. long, 9½ in. wide, being hung from the sill by two wrought-iron hangers. All doors are rendered weather-tight when closed by the use of interlocking joints and rubber packing. Both exit and entrance openings are of the same width, and the doors are provided with three glazed panels each, two of the formerly-used lower blank panels being glazed to enable the motorman and conductor to see the conditions existing outside the step when the door is closed. Four grab-handles are provided in each vestibule, two of these having been added in the reconstruction.

On the 20-ft. cars the snow scrapers have had to be moved back about 8 in. and the drawbars lengthened about 5 in., with an offset of about 4½ in. to clear the door and step-operating mechanism beneath the body. The steps when down are 13½ in. above the rail, the platforms being 13 in. above the steps and the car floor 5½ in. above the platform. Mason safety treads are being used on all steps, which are made of 1½-in. birch.

The car interiors are lighted by five 23-watt tungsten incandescent lamps, and in the reconstruction work these lamps have been fitted with Ivanhoe-Regent shades. In addition, the interior lighting has been greatly improved by applying a coat of white enamel paint to the vestibule ceiling and to the ceiling of the car body proper, including the headlining. Also two 23-watt lamps are installed side by side in the vestibules, and these greatly facilitate alighting and boarding at night. They are mounted directly in line with the passageway from the car interior to the vestibule.

An improvement in effect on all the reconstructed cars is the provision of a motorman's curtain of striped canvas in each vestibule. On the 20-ft. cars the curtain occupies about two-thirds of the width of the vestibule when in service, at other times being folded back at the side and held in place by straps. The curtains



REMODELED PORTLAND CARS—LONG-PLATFORM, SEMI-CONVERTIBLE CAR AS ORIGINALLY DESIGNED AND AS CHANGED FOR PAY-WITHIN OPERATION are hung on rings carried on a ⅜-in. curved rod, and they terminate at a height of 4 ft. above the floor, thus economizing in material and making their use more convenient for the motorman.

All cars are either retouched or repainted before being placed in service, and the work includes the necessary lettering for prepayment operation as well as painting to improve the diffusion of light within the car body.

Among the illustrations are views showing the vestibule of one of the double-truck, 28-ft. body cars and the vestibule of one of the semi-convertible cars before alteration. The removal of the bulkheads in these two types is complete, as before stated, and although none of the 28-ft. longitudinal-seat cars has been finished at this time, the interior view of the altered semi-convertible car gives an excellent idea of the improvement in both types resulting from the removal of the bulkhead and bulkhead doors. The interior view of the vestibule of a reconstructed semi-convertible car also gives a good idea of the appearance of the two types when completed. In the semi-convertible type the exit door at the right of the motorman's position consists of a fixed and sliding combination leaving about one-half the opening for the use of passengers, but in the 28-ft. city type of box cars the doors are all of the same size and of the folding type.

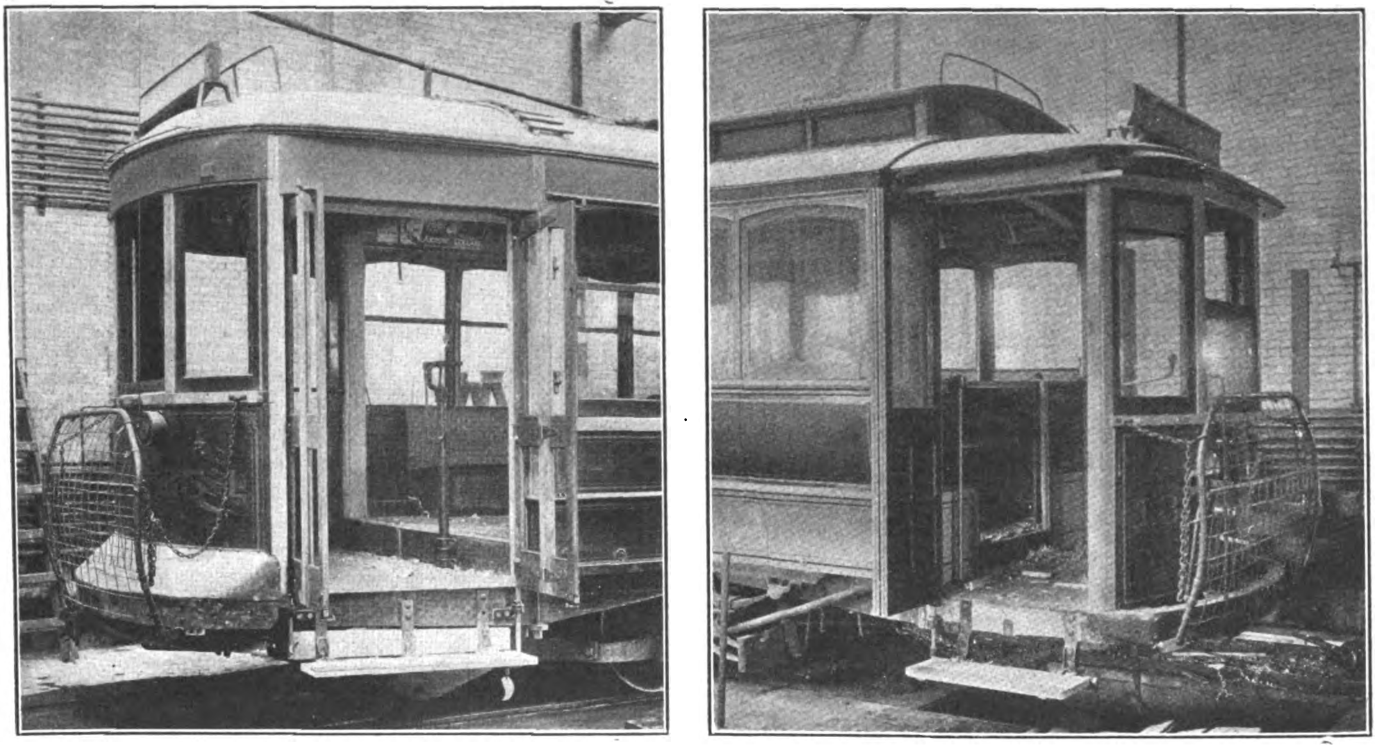
The reconstructed semi-convertible car has an entrance door opening 4 ft. in width, and the width of the bulkhead arch is 6 ft. 4 in., the vestibule being 5 ft. 6 in. long and the step dimensions on the entrance corners 10½ in. x 3 ft. 11 in. The heights from rail to step, from step to platform and from platform to floor are respectively 18 in., 14 in. and 9 in.

The rebuilt 28-ft. box cars have a bulkhead arch 6 ft. 3 in. wide in place of the former door opening of 2 ft. 4 in. The steps will be 3 ft. long x 10½ in. wide, and the heights from rail to step, step to platform, and platform to floor will be 18 in., 15 in. and 8 in. respectively. For the 28-ft. cars the doors are sawed in two and fitted with new stiles in the alteration to the synchronously controlled type. On the single-truck cars the doors are not split in this way, but are fitted with new hinges and rubber stops. The two semi-convertible cars originally were equipped with folding steps, but these had never been used until the reconstruction made it necessary. In general, the control of doors and steps by motormen and conductors follows the broad lines of design described under the single-truck cars, with the difference that in the large cars the fare box, with one controlling stand, is located nearer to the center of the bulkhead arch than in the smaller cars.

All of the reconstruction work is being carried on by nine mechanics. Ordinarily two men work on the doors, four on the car bodies, and the others on millwork and mechanical installation. Cars arriving at the shop are stripped of doors, bulkhead and old steps; the old doors are then rebuilt, including cutting down and the addition of new stiles. New headers, backing pieces and steps are gotten out, and the inside casing is finished around the bulkhead location. The fare-box mountings are then put on, and the control stands and the door mechanism and step-operating rods beneath the car, which are furnished complete by the National Pneumatic Company, are installed by the forge and equipping departments. The openings that are cut in the door panels are then glazed and the car is painted so far as may be necessary.

In all types the seating capacity remains the same after reconstruction, but the removal of the bulkheads increases the standing capacity somewhat, and even the smallest cars remodeled are singularly easy of access as a result of the changes effected. No changes are necessary in the brake rigging. In general, also, the platform lengths remain as before alteration of the bulkhead opening.

The cost of the modifications, exclusive of the fare-box installation, is estimated to be not in excess of $200 per car, or to approximate $320 per car, including the combination fare box and register. The work is being performed under the direction of E. W. Elgee, master mechanic of the railway company, G. S. Brush being general superintendent of the railway department with headquarters at Portland.



REMODELED PORTLAND CARS—CONSTRUCTION VIEWS

Regenerative Braking*

In a Paper Presented Before the American Institute of Electrical Engineers the Author Has Explained in Detail the Advantageous Features and Limitations of Many Possible Methods of Obtaining Regeneration with Different Types of Motor, and an Outline of His Conclusions Is Given

By R. E. HELLMUND
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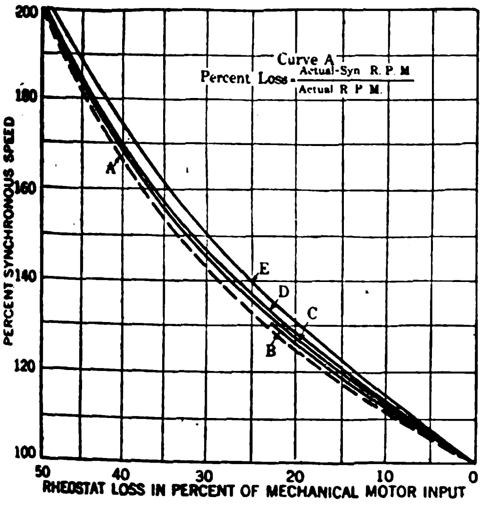
IN view of the great efforts that have been made to reduce energy consumption by other means, it is rather surprising that regenerative control has not been used to a greater extent in the past. The only reason for this must be that the increased complication and decreased reliability have been considered as outweighing the advantages. With the present advanced state of the art this condition has changed, and although some difficulties have to be overcome with the various operating systems for electric traction, there is no doubt that ordinary requirements for reliability and safety can now be successfully met in spite of some additional complications.

REGENERATION WITH INDUCTION MOTORS

With regard to the provision of the regenerative feature on a three-phase propulsion system, it may be said that the induction motors that are there used will automatically give regeneration so long as they are connected to the line, whether or not such a condition is desired. Regeneration in this case does not introduce any complication whatsoever, and to obtain satisfactory results it is necessary only to provide electrical equipment of sufficient capacity to take care of the regenerative current. In case rotary converting apparatus is used in the system, a certain amount of danger is introduced by the possibility of such apparatus overspeeding if the main power supply is interrupted for some reason or other where there is a train on a down grade to furnish power for the converting apparatus. In such case the train may, of course, accelerate and increase with its own speed the speed of the converter.



REGENERATIVE BRAKING—FIG. 1—RESISTANCE LOSSES FOR INDUCTION MOTORS AT SPEEDS OVER SYNCHRONISM WITH VARIOUS REGENERATIVE LOADS

The proper balance of the regenerative load between the different motors (in case of slight variations in wheel diameter) can be taken care of by the means provided for the same purpose during motoring. Some additional slight complication may be introduced whenever a locomotive is required to descend a grade with a train that involves tractive effort in excess of the locomotive's adhesion. In such a case the air brakes must be worked in conjunction with the regeneration of the engine, and since air brakes cannot be made to exert a uniform torque, it is necessary to introduce a variable resistance into the rotor circuit, which readily permits increases from synchronous speed to speeds of 5 m.p.h. or 10 m.p.h. higher. This involves a loss of energy through its dissipation in the resistance, but that the amount is within reason is shown in Fig. 1. This indicates the rheostat losses in regeneration, the curve *A* covering an approximate general rule while the curves *B*, *C*, *D* and *E* apply respectively to conditions where the actual torque is 75, 150, 225 and 340 per cent of full-load torque.

The increased tendency toward voltage variation that always exists with regeneration is of no great importance in connection with polyphase systems, because all parts of the system can easily stand a voltage increase for the short interval of time during which it commonly exists. In fact, an increase in voltage adds to the torque of the motors and does not impair the reliability of service. At times high voltage will unfavorably affect the power factor, but since it exists only at times of light loads this condition is of no great consequence.

The maximum braking torques are usually limited only by the slipping point of the wheels, since it is possible to keep the pull-out torque of the motors safely above this point. In fact, regeneration tends to bring about increased voltage and increased maximum braking torque, which is, even with equal voltage, larger than the maximum motoring torque, as indicated in Fig. 2. Here the curve *A* covers the condition where the rotor is short-circuited, while curves *B*, *C*, *D* and *E* apply to cases where the rheostat resistance is respectively three, nine, nineteen and twenty-nine times the rotor resistance.

Where slipping of the wheels is liable to occur it can easily be avoided by introducing automatic current-limiting or torque-limiting devices that prevent an increase in braking torque above the slipping point.

With the three-phase system, however, the possibilities for reducing the speed below the synchronous speed of the motors are either very limited in scope or necessitate the installation of cumbersome equipment, and their application in practice does not seem to be very likely in the near future.

The conditions prevailing with a phase-converter system employing a single-phase line and a phase-converter locomotive are practically the same with regard to regenerative braking as with the three-phase system.

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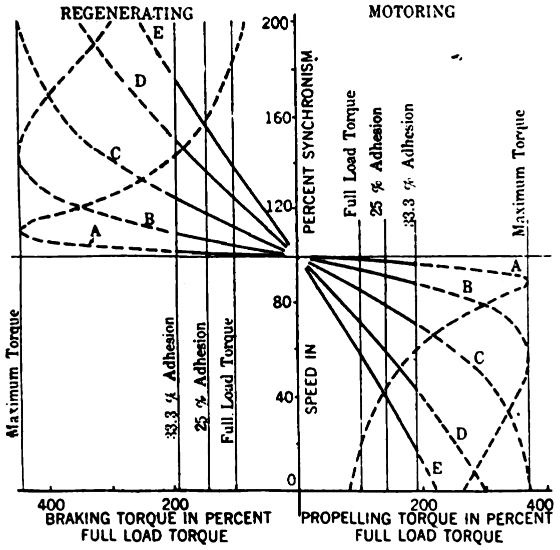
*Abstract of a paper delivered at the Pittsburgh meeting of the American Institute of Electrical Engineers Jan. 12, 1917.

This means that regenerative braking at synchronous speed or slightly higher may be accomplished with ease and safety and without requiring complication of any practical importance, but that the use of regeneration for retardation below synchronous speed is at present either limited in scope or complicated.

Requisites for Direct-Cubrent Regeneration

The present-day direct-current railway motor lends itself less readily to regeneration than the polyphase induction motor. The series motor, which has generally been introduced in railway work on account of its superiority for propelling purposes, cannot, without additional apparatus, be used as a generator under railway conditions. It is too unstable. In consequence, separate excitation offers the most promising possibility for successful regeneration, even though the addition of a separate source of current for excitation introduces an undesirable complication.

Many different connections and methods of excitation and, consequently, many different characteristics for the generators are made possible by separate excitation.



REGENERATIVE BRAKING—FIG. 2—INDUCTION MOTOR CHARACTERISTICS FOR VARIOUS AMOUNTS OF RESISTANCE IN ROTOR GIVING VARIATIONS FROM SYNCHRONOUS SPEED

Before discussing them, six of the more important requisites for regeneration that have to be considered in all cases may well be outlined.

Requistes for Direct-Current Regeneration

The first of these requisites is the necessity for avoiding excessive armature currents, especially at higher speeds. With direct-current motors running as generators, high armature currents, even of very short duration, introduce a tendency toward flashing. This is caused by high voltage between commutator segments, the maximum value for which is largely determined by the distortion of the field by the armature current.

With a separately excited generator that runs at high speed with a fixed motor voltage, the field strength must be of necessity very low. But at high speed, and consequently weak field, relatively large armature currents are required to exert an appreciable braking torque under normal operating conditions. This will tend to maintain a material distortion of the weak field, and further increases in field distortion caused by sudden rises of regenerative current in the armature are very liable to lead to flashing. There are two principal causes for such sudden increases of regenerated current. The first of these is the taking of steps in the control. The second and much more important cause is the tendency toward sudden changes in the line voltage. Hence it is very desirable to have such regenerative characteristics as will inherently avoid excessive armature currents.

The second requisite that must be met in all separately excited systems for direct-current regeneration is the question of relative ease or difficulty with which the motors can be connected to the line when regenerative control is desired. Automatic means for producing this result require relays that have to be very exact unless the system that is used is inherently such as not to require a very careful balancing of the voltages before the connections are made. This point is important in the choice of the proper system for regenerative control.

The third general requisite in connection with direct-current regeneration is that the regenerative load must be properly distributed among the various motors of the locomotive. For instance, a slight difference in the air gap of the motors, or a difference in the wheel diameters, will cause a very uneven distribution of load if the armatures of several motors are to be connected in parallel. A good system of regeneration, therefore, has to afford means for balancing the load fairly well between the various motors under practical conditions.

Torque-Speed Characteristics

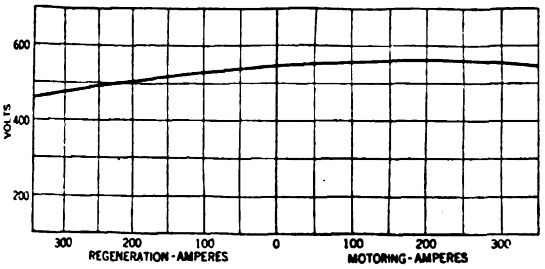
The fourth requisite to be fulfilled is that the braking effect of the vehicle shall not materially decrease with increased speed, nor materially increase with decreased speed, in so short a time that the operator, in case of manual control (or the relays of an automatic control) cannot follow the changes. Sudden large changes of braking torque should also be avoided when changes occur in the line voltage. A case to be considered is that of a train that reaches a section of steeper grade and speeds up to some extent. If, in this case, the generator characteristics should give a decreased torque with the increased speed, the train speed will unduly increase on account of the combined effect of the increased grade and the decreased torque, and this speed increase may reach serious proportions before the engineer has a chance to readjust the control or the air brakes or both. Unfortunately, the desirable condition that the braking torque should decrease with decreased speed, and vice versa, cannot be combined with the machine characteristic that is best for the avoidance of field distortion and motor flashing. On the other hand, the characteristic that is ideal for flashing conditions involves a highly undesirable torque characteristic, and a compromise between the two has to be made.

Still another requisite, the fifth to be considered in connection with the various direct-current systems, is the danger of over-voltage on the motors in case the power supply should be interrupted for some reason or other. The natural tendency with most systems fulfilling the previous requirements is, in case of power interruption, for the voltage of the generators to rise until saturation is reached, because the voltage is no longer limited by the line voltage. Since railway motors that operate at high speed as generators are always far from being saturated, it is quite possible to obtain voltage rises of two or three times the normal voltage, leading to flashovers and even to insulation breakdowns. Hence the inherent characteristics of the system should be such as to introduce a time element permitting the over-voltage relays to act before the over-voltage becomes excessive and dangerous. Unfortunately, it is also a fact that those systems which are the quickest to act in avoiding excessive armature current are usually the ones which are most liable to set up overvoltages quickly in case of power interruption when running at high speed. It is, therefore, again necessary to strike the best compromise.

Finally, in the case of the sixth requisite to be met in connection with direct-current regenerative control, it is necessary to pay much attention to the proper characteristics for the auxiliary exciting apparatus in order to have the system free from troubles. The principal danger is that the auxiliary exciter set, especially the driving part, is subject to flashovers unless precautions are taken in that direction.

POSSIBLE SYSTEMS FOR DIRECT-CURRENT REGENERATION

Subject to the foregoing six general requisites it now becomes possible to discuss the principal characteristics of the source used for separate excitation and the consequent characteristics of the main generator. A great number of arrangements may be devised, but to most of these exist objections on the grounds of unsatisfactory characteristics. For example, the undesirability of an increase of field excitation with increased regenerative current has already been pointed out. Also, an inherent increase of excitation voltage with decreased line voltage is undesirable because a decreasing line voltage means increased regenerative load, and this load would, of course, be further increased if the excitation was raised at the same time. Practically constant excitation, which might be obtained, for example, with a battery, does not give very desirable characteristics with regard to the limitation of the armature current. Thus, if the line voltage drops suddenly, the regenerative voltage will be much in excess of the line voltage, and there will be practically nothing that will inherently prevent excessive currents. From the test curves of a medium-sized railway motor shown in Fig. 3 it will be seen that, with a voltage drop of only 10 per cent, the regenerative current increases 100 per cent and the ratio of armature to field current goes up in practically the same ratio.



REGENERATIVE BRAKING—FIG. 3—TEST CURVE FOR STANDARD DIRECT-CURRENT RAILWAY MOTOR SHOWING RELATION OF VOLTAGE AND CURRENT WITH CONSTANT FIELD AND CONSTANT SPEED

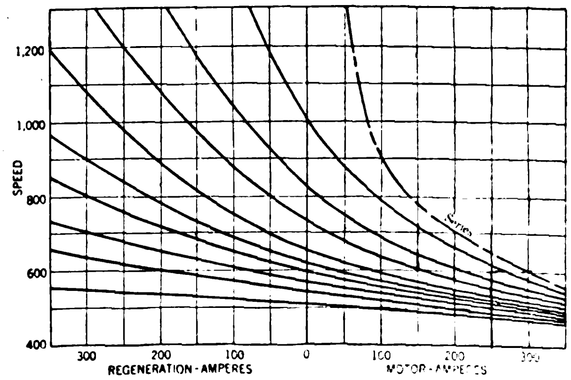
An arrangement in which the excitation voltage varies in proportion to the line voltage provides a very satisfactory system for taking care of variations in the voltage of the line, but it is less so with regard to the steps of the control, because the speed-current and the speed-torque characteristics are essentially those of a shunt machine. Another handicap of this system is that, when the motors are connected to the line, excessive currents are liable to be set up unless the voltage balances rather exactly or unless other precautionary steps are taken, such as the temporary introduction of resistance into the circuit.

The type of system shown in Fig. 5, however, fulfills practically all of the previously enumerated requisites. In this system arrangements are made so that the sum of the regenerative current and the field excitation current of each main generator passes through a common resistance. The circuits are further arranged so that the voltage of this resistance subtracts from the exciter-generator voltage to give the result in voltage of the main generator fields. With this arrangement, if the line voltage suddenly drops, causing an increase in regenerated current, it is evident that the current in the resistance must increase. The voltage of the resistance also increases, and since the voltage of the small exciter either is constant or is beginning to drop with the line voltage, it is evident that the main field voltage (this being the difference between the exciter and resistance voltage) must certainly decrease and cause the field current as well as the field to decrease. This gives a very quick readjustment and a desirable, negative-compound characteristic.

This system is particularly advantageous with regard to connecting the generators to the line. During tests generators have been put on the line with the no-load voltage regulated to 100 per cent higher than the line voltage, yet the maximum current obtained was well within permissible limits. The adjustment of relays, therefore, does not require any great degree of refinement. Also, since each motor has a separate compound effect the system will tend to distribute the load evenly between the motors.

SPEED RANGE FOR REGENERATION

This system, as well as those previously mentioned, are, of course, limited to a certain range of speed over which regeneration can be accomplished. The maximum possible operating speeds are usually limited only by the maximum operating speed of the vehicle, but the minimum speeds are given by the maximum possible saturation of the motors. It is evident that regeneration cannot be effected unless the regenerated voltage is slightly higher than the line voltage. If, therefore, the speed is such that even with fully saturated main fields a voltage above the line voltage cannot be induced, regeneration will be impossible. Since most standard railway motors are fairly well saturated at the one-hour rating, it is usually not possible to effect regeneration for speeds much below the standard hourly rating speed. The range of regeneration below this speed can be extended only by reducing the voltage across each motor. This may be accomplished in the same manner as during acceleration, by series-parallel control, or still further by parallel, series-parallel and series control.

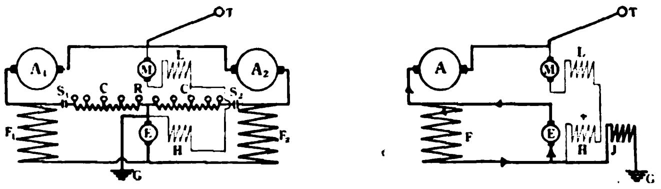


REGENERATIVE BRAKING—FIG. 4—CHARACTERISTIC CURVES FOR VARIOUS CONTROL STEPS OF DIRECT-CURRENT REGENERATIVE SYSTEM SHOWN IN FIG. 5

The fundamental principles illustrated in Fig. 5 have been very successfully applied to series-parallel control during regeneration whereby the range for regeneration has been extended from the maximum speed down to about 40 per cent of the hourly-rating speed. The system has also been worked out for manual control with automatic maximum torque requirements, the same connections, without alteration, being used for motoring and regenerating, and one locomotive thus equipped has been in successful operation on the Lake Erie & Northern Railway for the last seven months. In this case no difficulties have been found with main-motor or auxiliary-motor flashing, nor have control failures of any kind occurred, although the operating voltage is 1500 with an occasional maximum of 2000 volts attained during regeneration. The line is 15 miles long and had only one substation at the center during the first four months of operation. [This regenerative scheme was described in the ELECTRIC RAILWAY JOURNAL for Oct. 7, 1916, page 730—EDS.]

MINOR FEATURES INVOLVED WITH DIRECT-CURRENT REGENERATION

Aside from the essential features to be met by an ideal system of control, a great many minor features have to be considered. Among other things it is, of course, desirable to keep the exciter as small as possible in order to reduce the first cost and weight. In this connection three different principles of excitation may be considered. One of them involves having the exciter carry the sum of the exciting current and the regenerated current, as shown in Fig. 6. This gives, of course, a very large exciter with large commutators and numerous brushes. The principal advantage of this system, which has been applied on the locomotives of the Chicago, Milwaukee & St. Paul Railroad, seems to be that it avoids the necessity of connecting the motors to the line as generators. The arrangement is such that the motors are connected to the line in the regular way, at first as motors. Subsequently the exciter is connected across the field and raises its excitation until the motor voltage overcomes the line voltage and regeneration takes place. This requires the manipulation of two separate handles and does not permit series-parallel control without interrupting the braking torque. The second general principle of excitation is that wherein the exciter set carries the field current only, giving an exciter of small current capacity. This principle is used in the system shown in Fig. 5. The third principle makes use of an exciter set carrying the difference between the field current and the regenerated current, which provides a further opportunity for reducing the average current in the exciter, but which involves disadvantages such as that the exciter works at times as a motor, this leading to difficulties with flashing in the driving machine.



REGENERATIVE BRAKING—FIGS. 5 AND 6—SCHEMATIC DIAGRAMS FOR DIRECT-CURRENT REGENERATIVE SYSTEMS IN ACTUAL USE

A great many other possible systems for direct-current motors are available, even with the fixed voltages herein considered, and there are further possibilities for regeneration if motor voltage is made to vary from that of the line, this permitting regenerative braking down to zero speed. Such voltage variation is easily made possible through the use of booster armatures connected in series with the main armatures and arranged so that the voltage subtracts from the line voltage. Booster equipments provide several advantages, such as the opportunity for acceleration without rheostatic loss, but there are numerous disadvantages that tend to offset this.

In general, it may be said that the result of regeneration upon direct-current lines may at times be rather disadvantageous with regard to fluctuations in line voltage. With low-voltage systems having a low density of traffic, voltage rises of 15 per cent above the maximum voltages otherwise obtained are not at all unlikely. Regeneration may also be disadvantageous where non-commutating pole apparatus is installed in existing substations. Such machines depend upon a certain shifting of the brushes to commutate successfully, and when the current reverses, the brush shift is in the wrong direction and rather bad commutating conditions will be obtained.

ALTERNATING-CURRENT COMMUTATOR MOTOR SYSTEMS

Since alternating-current commutator motors are always provided with cross field-winding to prevent armature distortion, and since they always have relatively low commutator voltage, the flashing difficulty is largely eliminated and the danger of over-voltage is minimized. The existence of a transformer on the car or locomotive makes variation of the voltage on the motor very easy, so that weakened fields at high speeds are not a necessity and regeneration at all speeds down to a standstill can be accomplished. On the other hand, additional problems are introduced because the characteristic of the regenerating voltage must be right, not only with regard to its size but must also be correct in phase. Another difficulty is to obtain proper commutating characteristics for all speeds during regeneration, this latter problem being generally identical with the commutating problem of single-phase motors during acceleration. A practical application of a system in which exciting current was furnished by an alternating-current generator was made on a locomotive built several years ago for the Midi Railway in France. This machine was equipped with only two large motors, one of which was used as an exciting generator for the other motor during regeneration. The system worked very satisfactorily, but was later abandoned by the railway company in favor of dynamic resistance braking because there was an abundance of water power available and because no saving whatever could be effected by the use of regenerated current.

The difficulty of connecting alternating-current generators to the line is materially reduced as compared to direct-current motors, because the inductive effect of an alternating-current system materially reduces the tendency toward current peaks. The introduction of a certain amount of compound characteristic by the means previously described will, of course, further assist in keeping down current peaks. As a rule, satisfactory commutation can be obtained in all cases during regeneration, although certain complications in the control may have to be introduced for this purpose.

[In Mr. Hellmund's paper no less than twenty-one different possible systems for regeneration were described and illustrated by diagram. Unfortunately, space limitations prevented the publication of these descriptions with the exception of the two most prominent, of which one displays the principle adopted by the Chicago, Milwaukee & St. Paul Railway and the other that installed on one of the Lake Erie & Northern Railway's locomotives.—EDS.]

A.I.E.E. Discusses Regenerative Braking

At the Pittsburgh Meeting of the American Institute of Electrical Engineers the Entire Session Was Devoted to R. E. Hellmund's Treatise on This Subject

THE 328th meeting of the American Institute of Electrical Engineers was held in Pittsburgh, Pa., on Jan. 12, 1917, under the auspices of the Pittsburgh section of the Traction and Transportation Committee. The session was called to order by President H. W. Buck, who introduced R. E. Hellmund, Westinghouse Electric & Manufacturing Company, as the speaker of the evening. Mr. Hellmund then gave a forty-minute abstract of his paper on regenerative braking for electric vehicles, which is published in condensed form on the preceding pages.

Robert Lundell, consulting engineer, New York City, opened the discussion by telling of some of the pioneer work with which he had been connected. In 1895 he experimented with a small compound-wound motor having two armature windings and two commutators. It was possible to connect the commutators of each motor in series or in parallel and thus he got great flexibility of control for regenerative purposes. He also described tests made in 1902 at Newcastle in which the regenerative equipment used 25 per cent less energy than the standard equipment. During the test he was acting as motorman and was following a car having the standard equipment. This car suddenly stopped and Mr. Lundell threw his controller to the braking position so quickly that the regenerated current exceeded the 200-amp. for which the breakers were set and they opened, thus destroying the braking effort and causing a collision, which, however, did not prove to be serious.

He had hoped to find in Mr. Hellmund's paper some actual data on the amount of energy saved, and gave some figures which showed that a regenerative equipment had accomplished a net saving of 30 per cent over the energy used by standard equipments. The tests showing this saving were made in Germany in 1906.

E. W. Alexanderson, General Electric Company, said the work that had been done on regeneration had proved the fundamentals he had laid down when he took up the work. These were that the proper dynamo to use where regeneration was to be accomplished was one having a volt-ampere characteristic which would give electrical stability, and a speed-torque characteristic which would give mechanical stability. He defined stability as a condition such that the result of a change would not tend to produce a greater change but would tend to reduce or resist the change itself. Several sets of curves were displayed to illustrate the mechanical and electrical characteristics of different motors with various methods of regeneration.

David Hall, Westinghouse Electric & Manufacturing Company, in his discussion emphasized the importance of designing the master controller so that both acceleration and regeneration would be established gradually, and that the transition from motoring to regeneration should be accomplished without opening the circuit. He said that the problems of control had been chiefly responsible for keeping out of practical operation most of the systems of regeneration except those on three-phase lines. A discussion written by R. E. Ferris, was then read in which it was pointed out that the improvements in railway motors had reached such a stage that it was necessary to provide for regeneration in order to go on with the work of making more efficient motors.

W. V. Turner, chief engineer Westinghouse Air Brake Company, said that regenerative braking would not replace air brakes, and that while regenerative braking is needed for economy, air brakes are necessary for safety. He pointed out that with regenerative braking and no air brakes it would take as many locomotives to take a train down a grade as to pull it up the same grade. In other words, the pusher locomotives could not be cut off after ascending a grade when a descent of a similar grade was to follow. He also showed that even if the helper locomotives were left on for regenerative purposes they would not be in the proper position in the train for braking since the proper pushing and braking positions were not the same. He said that the regenerative braking system should be so interlocked with the air brakes that, should the regenerative braking fail or should the speed tend to exceed that which would be safe for air-brake operation, the air brake would be automatically applied.

H. M. Hobart, of the General Electric Company, described in an interesting manner the history of the regenerative braking developments. He said that much of the early work was done in England, and that the first successes were attained there. Due credit, he said, should be given to Frank J. Sprague and E. H. Johnson for their pioneer work in the field.

F. R. Phillips, superintendent of equipment, Pittsburgh Railways, was then called on as representing the American Electric Railway Association. He said that car developments in recent years had caused reductions in the car weight of 45 per cent, and that electric railways had come to learn that this meant a material saving in their power bill. Consequently, the railways would look with suspicion on any plan which called for such an increase of car weight as those outlined at the meeting. Each ton added to the weight of a car cost about $70 per annum for power alone.

As opposed to this view Prof. C. A. Adams, of Harvard, remarked that this extra energy necessitated by extra weight would be returned to the line during the braking. Following this a discussion by C. F. Fortescue was read. His plea was for the constant speed motor for heavy electric traction. This type of motor lends itself most readily to regenerative control and made it easier to maintain a higher average schedule speed. However, regeneration was possible on any system except those using mercury arc rectifiers.

N. W. Storer, Westinghouse Electric & Manufacturing Company, then read a discussion by W. B. Potter, General Electric Company, which took up the problems of d.c. regenerative systems, since, as he said, the a.c. problems had been pretty well solved. He called attention to the fact that a machine such as a series motor having good and stable characteristics, when worked as a motor, had poor and unstable characteristics when worked as a generator. He concluded saying that Mr. Hellmund's paper could be amended by saying that the developments of regenerative braking had reached a point where the new method of operation was of great commercial importance. Mr. Storer then discussed the subject himself, stating that the standard series motor must always be used on account of its inherently good motoring characteristics. The early experiments in regenerative braking had been unsuccessful mainly because the engineers were using shunt motors. Ways could be found of making the series motor more stable as a generator, and if it did give insufficient braking occasionally, with the air brakes there was nothing to worry about. In other words, air brakes should take care of the emergencies. By a series of curves he showed in a striking manner the economy of regenerative braking, at what speeds it was practical to use regeneration and the amount of energy that could be saved.

Mr. Hellmund in closing the discussion said that the co-operation of the railway men with the manufacturers was essential in working out the problem, and that he believed that the railroads would come to see that the constant speed motor was what they want.

Electric Railway Transportation in Manila

C. N. Duffy Explains the Problems Which Differentiate Street Railway Service in the Orient from That in the Occident

C. NESBIT DUFFY, vice-president, Manila Electric Railroad & Light Corporation, who is now in the United States for a short stay, gave a very interesting talk recently to the editors of the ELECTRIC RAILWAY JOURNAL on some of the peculiar conditions surrounding the operation of the Manila electric railway system. Some of the most important points which he touched upon are given in the following paragraphs.

C. NESBIT DUFFY

In the first place it should be understood that the orientals had solved their transportation problems in a fairly satisfactory manner long before electric railways were even dreamed of. In Manila the very moderate requirements for local transportation was met by street rigs, principally of the two-wheeled variety, drawn by native ponies. In Japan the jinrikisha met a similar need. When, therefore, the J. G. White Company decided to enter the transportation field in Manila, they found the population fairly well satisfied with the facilities for getting about. The company required a vision of the future development which modern railway equipment in Manila would bring about in entering this already occupied field. Now the city has a modern system which it supports reasonably well.

SPECIAL DIFFICULTIES HAD TO BE SURMOUNTED

One of the difficulties incident to the necessity for providing for two classes of the population is the division of the car space into first and second-class sections. This has been solved by dividing each car into two sections by means of a barrier, a suitable proportion of the space being reserved for each class of passengers. The practice is for the first-class passengers to enter and leave the front, while the second-class passengers use the rear.

A more serious matter is the safe operation of the cars in the narrow, crooked, congested streets. Not only are the streets narrow, but the sidewalks are correspondingly narrow at times, forcing pedestrians to walk in the roadway. The density of population in some parts of the city is also very great, resulting in crowding of the streets and the use of the roadways as playgrounds for children. In spite of these adverse operating conditions, the number of street accidents in Manila is very small, which fact is recognized by the population as very creditable to the native motormen.

Climatic conditions in this region are favorable for the transportation in some respects, but impose difficulties in others. While the average minimum temperature is about 72 deg. Fahr. and the maximum 88 deg., the rainy season extends for three months between July and October, and the typhoons bring terrific winds with the rain. It is quite a problem to provide cars which will be comfortable in respect to temperature and at the same time provide protection from the typhoons. During the storms the wind also causes obstruction of the track by blowing down branches of trees, and interference with power transmission. In spite of these special difficulties, however, the company is able to maintain reliable service by adapting its equipment to the local needs. The entire train force is recruited from the Filipino population with the exception of the superintendent and assistant superintendent of transportation. Many of the men have been in service since the road was opened in 1905, and as operators they compare favorably with motormen and conductors in cities of the United States.

A rather peculiar situation faced the company in connection with the eating habits of the natives. The Filipinos are small but active, and they make excellent linemen as well as platform men. However, they are inclined to eat at all times of the day, and have a fondness for sweets. The management realized that good food is the basis of good service and accordingly made provision for a company restaurant. This was particularly needed in the rainy season. Accordingly a section of a carhouse was fitted up for restaurant purposes and leased to a Chinese at a nominal rent. The company controls the standards of service and food, so that the men now get excellent food under proper conditions and at reasonable rates. This restaurant is operated twenty-four hours a day every day in the year.

TRANSPORTATION COMPETITION IN MANILA

There are more automobiles in Manila than in any other city in the Far East, including quite a number in public service. In addition there are the pony-drawn rigs already referred to. The total number of street rigs competing more or less with the railway is about 4000, and these are estimated by the company to have carried 17,000,000 passengers in 1915. This total is about the same as the electric railway business. The street rigs will accommodate about three times as many persons as can be seated in the street cars. The street rigs are estimated to have collected in fares in 1915 about two and one-half times as much as the railway. These estimates are made by the railway management partly on the basis of the taxes on receipts paid by the street rigs.

The street rigs vary in size from the two-wheel vehicle seating two persons to buses seating twenty or more. The municipality prescribes the rates which can be charged for rigs. By the hour the charge is 40 cents in gold for first-class, and 20 cents per hour for second class. The drivers will haul single passengers for less than a mile for 5 cents gold and from one to two miles for 10 cents, additional passengers being carried at reduced rates. The average fare per passenger is probably about 10 cents.

In comparison with the fares charged by the street rigs, the railway fares are as follows: The first-class cash fare is 6 cents, ticket fare is 5.5 cents. The second-class cash fare is 5 cents and the ticket is 4 cents. A 3-cent fare without transfer privilege, a voluntary concession by the company, is accepted up to 7 a. m. The average fare per revenue passenger is approximately 4 cents, and with transfer passengers included approximately 3 cents. All of these fares as quoted are in gold.

At present about one-half of the cars are of the open type, but the preference is for closed cars. The reasons for this will be clear from the statements already made and also when the difficulties of fare collection are considered.

The company is using every opportunity to utilize its equipment efficiently. Bi-weekly company conferences of officials and department heads are held for the purpose of discussing general problems, and in the intervening weeks departmental conferences are conducted with special attention to details.

The joint company section of the American Electric Railway Association and the National Electric Light Association is of great value in promoting a company spirit. The section in Manila has now 118 members and is doing excellent work along educational and constructive lines, as is evident from the reports appearing from time to time in the columns of the ELECTRIC RAILWAY JOURNAL.

Maintaining a Continuous Property Inventory

Such a System Makes Value Figures Readily Available for Various Uses—Substitutes Facts for Guesswork in Figuring Operating Costs

By HAROLD BATES

Assistant Construction Engineer The Connecticut Company, New Haven, Conn.

THERE are very few electric railways on which improved methods and decreased annual expenses could not be secured if sought for in a scientific manner. The first step, for any company that desires to increase its efficiency, is to determine where and how inefficiencies exist. This necessitates true cost figures that can be analyzed and compared. In calculating such costs, however, interest on the investment and depreciation must be considered, these in turn being based on a knowledge of the detailed property investment or value. It is thus evident that a system which will maintain and show at all times the detailed property value is of the utmost importance in the study of the efficiency of electric railway operation.

BENEFITS OF A CONTINUOUS INVENTORY

In general, the benefits to be derived from the institution of such a system as indicated above, *i.e.*, a continuous inventory of railway physical property, may be classed under two general headings:

1. The ready availability of the figure for the value of any part of the property, and the actual time saved in looking it up, when such information is required for insurance, rate cases, issuance of securities, check on renewals, reports to utility and tax commissions, etc. In this way the inventory is in itself efficient.
2. The substitution of facts for guesswork in the figuring of all operating costs, because of the availability of detailed property values. In this way the inventory is essential to increased efficiency in operation.

PRESENT PROPERTY RECORDS ARE INEFFICIENT

The property records, as they are now kept by most companies, are not efficient in furnishing information for the various purposes outlined under the first heading. In connection with all early acquired or constructed property many companies have very meager records, or records not classified in any detail by accounts. In such cases it has been necessary to make an appraisal in order to determine the value of property units, but after this the values of the various units have not been maintained up to date. An inventory has been lacking, and it has been necessary to hunt through records of expenditures to determine what, if any, changes have occurred in the property since the date of the appraisal.

The property records of later and present-day work are, of course, in more nearly complete form, and the actual cost will usually be found distributed by account numbers under a work order or authorization-for-expenditure number. Such records have their shortcomings, however, for it is sometimes found that when the cost of a certain section of the property is desired, this section represents expenditures under a number of orders or authorizations. On the other hand, it may represent only a part of the property covered by one authorization. In such cases the amounts shown have to be added or separated, as the case may be, before the desired figure can be ascertained.

Yet, even if the existing records as maintained by the accounting department were complete and covered the property section desired, there would still be an essential difference between such records and a perpetual inventory. In the former case the property would be recorded by the dollars and cents expended to produce it and would be classified in certain general groups. In an inventory, however, the property would be recorded and classified by the units that are usually dealt with in practically all problems pertaining to railway operation. For example, to find the cost of a power-station building, it is necessary under the present methods of accounting first to determine how many authorizations for expenditures were issued which included items entering into the makeup of this building, and then to pick out and add such items. In a continuous inventory, this building would be maintained as a unit, its total value being corrected as additions and betterments and retirements were made. The old questions—"How much does this expenditure cover?" and "Are you sure that all expenditures have been included?"—are not necessary when one is looking up property in an inventory, as values are recorded by the units of property usually called for.

A continuous inventory system, such as that outlined in the 1916 report of the engineering-accounting committee of the American Electric Railway Association, would, if adopted in full, obviate all of the foregoing defects of the present method of handling property records and would show at any time the various kinds of property in detailed sections, as well as the value, up to date. By full adoption of the inventory system is meant the inventorying of the entire property, the appraising of those parts for which there are no cost records and the segregating of all values into the desired sections and units. If a company does not desire to undertake the expense of an appraisal at once, the continuous-inventory system may still be adopted, for the time being, for the property whose costs can be taken from the records and for all new and renewed property as the authorizations are completed. All unrecorded property can then be gradually appraised, either as it is affected by additions and betterments or at a certain rate of so much a year.

With such records available as are provided by a continuous inventory, it is a simple matter to furnish the information regarding physical property that is called for in many of the reports to utility and tax commissions. The New York State Tax Commission especially calls for this information in such detail that some form of inventory is becoming necessary. The desirability of such records in connection with applying for rate increases, furnishing information for security issues, determining the amount of insurance to be carried and the adjustment for fire and other losses, making sales or purchases of property, etc., is obvious when their availability, adaptability and accuracy are realized.

AID IN CALCULATING OPERATING COSTS

Although a continuous inventory is efficient in itself in furnishing information for use along the foregoing lines, its greatest importance lies in its use in connection with the calculation of operating costs, as mentioned before under the second heading. It is, of course, essential in any railway property to know not only the total net income, but also the net income from the various revenue-producing divisions and departments so that any losses and inefficiencies may be ascertained and properly handled.

Take, for example, the operation of park property. This class of property is primarily operated as a traffic inducement, but is it not desirable to know definitely how much money is being made or lost in this operation, so that studies may be started to make this property in itself a better producer of net revenue as well as a traffic producer? Unless the railway official knows the value of the power station in park service, how can he ascertain the true cost of power used, which must include interest and depreciation on the property? Unless he knows the value of the park property, how can he find out its true operating costs, covering interest and depreciation? Without such true costs, how does he know that the park property is not losing more money than is made by the increased traffic?

Should not interdepartmental charges for power, shop repairs, etc., include interest and depreciation charges in order that the relative efficiencies of different departments may be known? Is any company sure that some of its shop work cannot be done cheaper by an outside concern, unless it includes in its costs the same charges that are included in work done outside?

Moreover, an electric railway doing an express business should know definitely how much this department of the business nets, and whether or not it might be better to devote the facilities and power used for express service entirely to the conduct of passenger business. To know this it is necessary that the entire value of property used exclusively and in part for the express business be ascertained, and that all proper interdepartmental charges be set against this business.

Furthermore, in calculating the cost of rush-hour service, it is essential that the property necessary for this service, over and above that necessary for regular service, be known definitely in order that accurate costs may be secured. From many present-day records this splitting up of property values is a difficult task and will probably, at least in part, be an estimate.

SHOWING DEPRECIATED VALUES

The continuous-inventory system outlined by the 1916 engineering-accounting committee provides for the showing of depreciated values on all property. To do this it is necessary that the rates on all different classes of property—and they vary considerably—be set up and available for ready application. There has been some objection to the practice of carrying depreciated values in the inventory, but there are many reasons that make it desirable.

No insurance company, for instance, will cover more than the present value of property, but to know that all property is properly covered by insurance it is necessary for the railway to have first-hand information regarding such value.

Moreover, in checking tax assessments and appearing before municipal and town authorities for adjustment of assessments, companies will find that depreciated values are essential to substantiate any contentions. The New York State Tax Commission requires that such values for all physical property be shown in detail in reports to it.

With the age, depreciation and present value given for all property units as listed in the inventory, valuable information is also at hand for determining the proper sums to be set aside to cover depreciation and for disclosing where replacements are urgent or likely to be necessary in the near future. With such information it becomes possible to forecast accurately what the maintenance costs should be for succeeding years. By calculating the weighted age of property units, it is possible to interpret the maintenance accounts with greater accuracy. Detailed units costs on both construction and maintenance work can be calculated and compared, thereby giving more information for checking efficiency.

SEPARATE DEPARTMENT IS NEEDED

The work of maintaining an inventory is more an engineering than an accounting matter. There are no involved accounting problems in maintaining an inventory ledger, but egineering knowledge or familiarity with the physical property is essential to maintain the unit values on the ledger. As the work is joint to a certain degree, however, better results would in all probability be achieved by not allying it with either the engineering or the accounting department. Since the co-operation of all departments is absolutely necessary for the proper handling of the work, it seems most desirable to establish a separate inventory department and to put the other departments all on a par in their relations to it. The man in charge of the inventory work should have a certain practical knowledge of engineering and accounting and at the same time be more or less familiar with the physical characteristics of railway property.

Efficiency is not gaged by the amount of money expended but by the results achieved from such expenditure. I believe that the institution of a continuous-inventory system on any property would result in beneficial achievements along the lines pointed out to such an extent that it would be pronounced a long step in increased efficiency.

If the transfers printed by the United Railways of St. Louis, St. Louis, Mo., and given to the public were placed end to end in one year, according to the *United Railways Bulletin*, they would reach around the world and would then lap over from St. Louis to New York. These transfers, a fraction more than 6 in. in length, would stretch a distance of approximately 25,000 miles. The company prints and gives to the traveling public an average of about 22,000,000 transfers each month in the year. The winter average is around 20,000,000 monthly, while in the summer the number runs up to 25,000,000 for some months, August being the largest. About fourteen carloads, or 700,000 lb. of paper, are used annually in printing the transfers, in the company's own finely equipped shop, under the direction of J. Guy Robertson, superintendent.

ASSOCIATION NEWS

In Preparation for Inauguration of Joint Company Section of Four National Societies Toledo Company Outlines Organization as Charted Below—New Publication for Public Service Announced at Newark Meeting—Other Sections Active Also

Manila Section Elects Officers

At the twenty-third monthly meeting of joint company section No. 5 held on Dec. 5, in Manila, the results of the annual election were as follows: President, F. P. Santiago, assistant claim agent; vice-president, J. W. Earle, assistant to auditor; secretary, M. E. Chavez, chief clerk commercial department; treasurer, W. A. Seten, sales agent; director for four-year term, C. Keesee, superintendent of transportation.

In addition to the election three applicants from the transportation department were elected to membership and the president announced that at the January meeting medals would be awarded for the best three papers presented during the year 1916. The transportation department orchestra furnished music during the evening and a game of volley ball was played between an all-Filipino team from the electric department and an all-American team from all departments. The American team won by a narrow margin.

Toledo Section Organizing

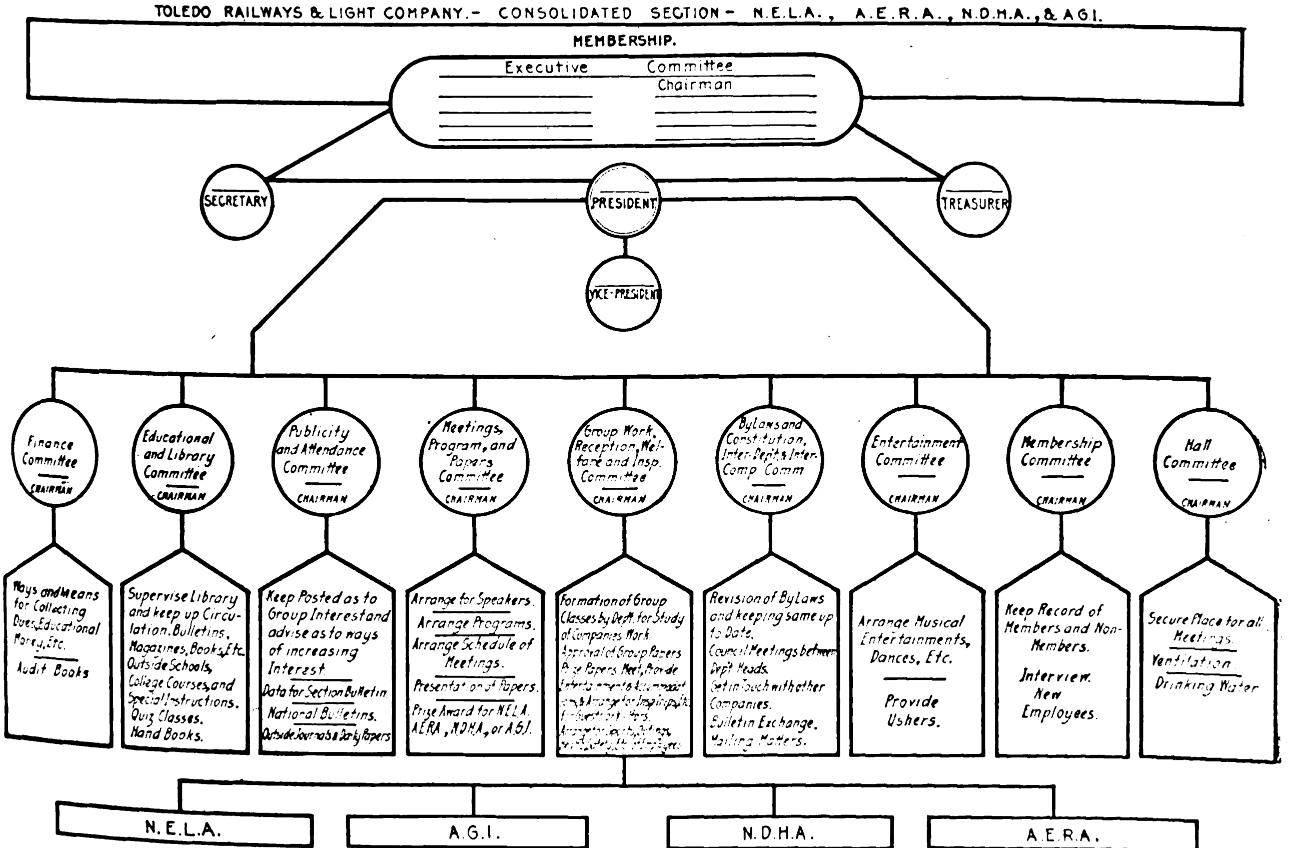
Henry Friede, secretary of the joint company section which is being formed on the property of the Toledo Railways & Light Company, Toledo, Ohio, reports that the organization will be perfected at a mass meeting to be held next Tuesday in the Newsboys' Auditorium in that city. The section will be devoted jointly to the interests of the American Electric Railway Association, the National Electric Light Association, the American Gas Institute and the National District Heating Association. The tentative organization plan which has been worked out is shown in the accompanying diagram.

The program for the opening meeting comprises addresses by G. B. Muldaur, field secretary N. E. L. A., and Martin Schreiber, engineer maintenance of way Public Service Railway, Newark, N. J., chairman of the American Association committee on company sections and individual membership. A new musical organization, composed exclusively of company employees and appropriately named "The Rail-Light Band" will make its first public appearance.

The spirit in which the new work is being undertaken is indicated by the following quotations from Mr. Friede's report:

"In this undertaking we shall succeed because we are pinning our fate to a very good slogan which has been in use by a small mid-western city for some time, namely 'The dern fool didn't know it couldn't be done, so he went ahead and did it.' There are several very good reasons why we are trying to consolidate the work, the most important being that we have a property which provides railway, gas, heating and electric service to a large and ever-growing community. We believe that any educational movement, such as the one under-

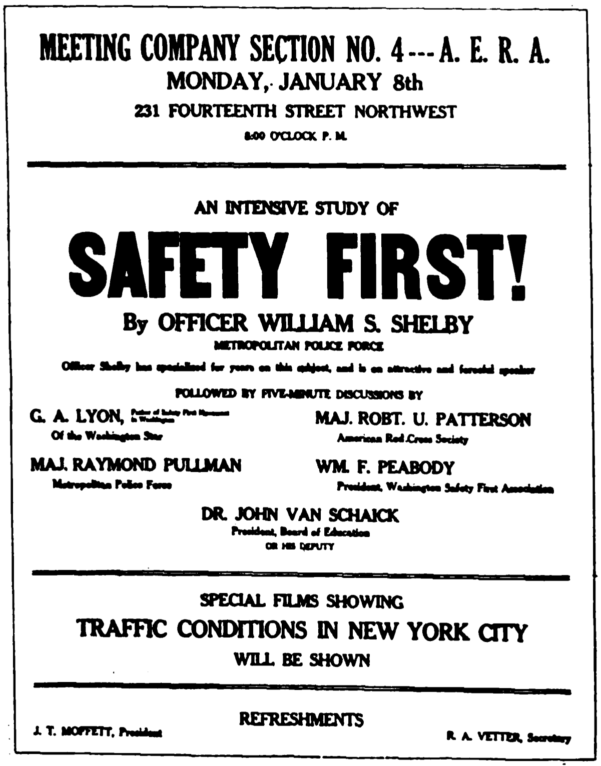
TENTATIVE
ADMINISTRATIVE CHART
TOLEDO RAILWAYS & LIGHT COMPANY.- CONSOLIDATED SECTION - N.E.L.A., A.E.R.A., N.D.H.A., & A.G.I.


MEMBERSHIP.
Executive Committee
Chairman
SECRETARY
PRESIDENT
TREASURER
VICE-PRESIDENT
Finance Committee
CHAIRMAN
Educational and Library Committee
CHAIRMAN
Publicity and Attendance Committee
CHAIRMAN
Meetings, Program, and Papers Committee
CHAIRMAN
Group Work, Reception, Welfare and Insp. Committee
CHAIRMAN
ByLaws and Constitution, Inter-Dep'ts & Inter-Comp Comm
CHAIRMAN
Entertainment Committee
CHAIRMAN
Membership Committee
CHAIRMAN
Hall Committee
CHAIRMAN
Ways and Means for Collecting Dues, Educational Money, Etc.
Audit Books
Supervise Library and keep up Circulation. Bulletins, Magazines, Books, Etc. Outside Schools, College Courses, and Special Instructions. Quiz Classes. Hand Books.
Keep Posted as to Group Interest and advise as to ways of increasing Interest
Data for Section Bulletin.
National Bulletins.
Outside Journals & Daily Papers
Arrange for Speakers.
Arrange Programs.
Arrange Schedule of Meetings.
Presentation of Papers.
Prize Award for N.E.L.A. AERA, NDHA, or A.G.I.
Formation of Group Classes by Dept. for Study of Companies Work.
Approval of Group Papers
Revision of By Laws and keeping same up to Date.
Council Meetings between Dep't Heads.
Get in Touch with other Companies.
Bulletin Exchange.
Mailing Matters.
Arrange Musical Entertainments, Dances, Etc.
Provide Ushers.
Keep Record of Members and Non-Members.
Interview New Employees.
Secure Place for all Meetings.
Ventilation.
Drinking Water
N.E.L.A.
A.G.I.
N.D.H.A.
A.E.R.A.

taken, should cover as far as possible the entire property and we shall not stop until success in great measure has crowned our efforts.

"Beyond all doubt one of the greatest benefits possible for the future is that which will come through a proper understanding of the company's general affairs by its employees. We firmly believe that the improved departmental relationship and the better individual feeling we have always hoped to obtain will come largely through a progressive and enthusiastic educational movement. We are all very enthusiastic about the proposed plan and believe that it will lead us into brighter and better paths for the future."

Washington Ry. & Elec. Co. Section



MEETING COMPANY SECTION NO. 4---A. E. R. A.
MONDAY, JANUARY 8th
231 FOURTEENTH STREET NORTHWEST
8:00 O'CLOCK P. M.

AN INTENSIVE STUDY OF
SAFETY FIRST!
By OFFICER WILLIAM S. SHELBY
METROPOLITAN POLICE FORCE
Officer Shelby has specialized for years on this subject, and is an attractive and forceful speaker

FOLLOWED BY FIVE-MINUTE DISCUSSIONS BY

G. A. LYON, Father of Safety First Movement in Washington
Of the Washington Star

MAJ. ROBT. U. PATTERSON
American Red Cross Society

MAJ. RAYMOND PULLMAN
Metropolitan Police Force

WM. F. PEABODY
President, Washington Safety First Association

DR. JOHN VAN SCHAICK
President, Board of Education
OR HIS DEPUTY

SPECIAL FILMS SHOWING
TRAFFIC CONDITIONS IN NEW YORK CITY
WILL BE SHOWN

REFRESHMENTS
J. T. MOFFETT, President
R. A. VETTER, Secretary

The reproduction of a large poster used in advertising the January meeting of Company Section No. 4 gives the story of the meeting in a nutshell.

Public Service Section

At the meeting of Company Section No. 2, held in Newark, N. J., on Jan. 18, the principal speaker was Percy Ingalls, secretary Public Service Railway. He gave "A Few Impressions of England in War Time." J. L. O'Toole, publicity agent, made the announcement that the first issue of *The Trolley Wheel*, the employees' magazine of the company, was on the press and would be out within a few days. Its purpose is to furnish a medium of communication among the men and to constitute a popular history of the development of the property. Secretary F. J. Davis reported the receipt of eight applications for membership, and Chairman A. T. Warner stated that this brings the membership to 453.

Mr. Ingalls' talk was based upon a trip which H. C. Donecker and he had made to England last summer. His description of the Zeppelin raids, the training camps, the precautions for safeguarding the country, the substitution of women workers for men, etc., gave his hearers a vivid picture of conditions in a country at war. The visitors saw much of Sir Albert Stanley, a former official of the company, and one of the most interesting parts of Mr. Ingalls' remarks was that in which he paid a tribute to this railway man who now plays such an important part in England's share of the war.

F. W. Doolittle Speaks in Milwaukee

At the meeting of company section No. 1 held on Jan. 11 in Milwaukee, F. W. Doolittle, formerly head of the bureau of fare research of the American Association, read a paper on "Some Phases of Our Fare Case." He gave a digest of the several fare cases in which the company had been involved and also analyzed the elements of the present case. He took up among other topics the eight-hour question and the increases in the costs of commodities contributing to the present high cost of living.

Mr. Doolittle was followed by A. D. Schwenke of the accounting department who explained the work done by that department and showed how this work is facilitated by the use of the latest labor-saving devices. He used lantern slides to explain the workings of the several devices and statistics to demonstrate the savings which have been secured. A lively discussion followed the presentation of this paper, covering the topics brought up by both speakers.

Other features of the program were several piano duets by W. C. Bolt and W. W. Cook, active members of the section, and the distribution of the regular "Review of the Technical Press." Sixty-five members attended the meeting.

Cost of Bus Operation Soars

Increased costs for motor bus operation due to the European war average considerably more than 100 per cent, according to a report sent out by the Fifth Avenue Coach Company, operating principally on Fifth Avenue, New York, on a 10-cent fare. The company says:

"When one considers that in some cases the increase in price amounts to more than 300 per cent and many times to more than 200 per cent it is not to be wondered that a quietus has been placed on jitney buses and that public transportation lines throughout the country are feeling the high cost of living.

"Some of the most noticeable increases in the cost of raw materials are in the electrolyte used in the lighting batteries, which has risen 388 per cent; aluminum, which has risen 248 per cent, and sheet brass, 188 per cent. Gasoline, which is consumed by the buses by the carload, has doubled in price. Strangely enough, green paint, which is the official dress of the big double-deck buses so familiar to New Yorkers, has had the smallest proportional advance of all the materials necessary to bus operation—only 9 per cent."

Buenos Aires and Tigre Connected by Electric Lines

Tigre, a popular pleasure resort 27 miles from Buenos Aires, was recently linked more closely with this city by the electrification of a suburban railroad. The road belongs to the Central Argentine system. The main power plant, located near Tigre, generates current at 20,000 volts, which is distributed through underground cables to substations which supply the trains by means of a third-rail. The coaches are connected in units of two, consisting of a motor car and a trailer. Two units make up the standard train, although more may be used. The steam railways have been running from thirty to fifty trains daily between these two cities according to the *Bulletin* of the Pan-American Union.

COMMUNICATIONS

Tributes to the Memory of Henry Gordon Stott

INTERBOROUGH RAPID TRANSIT COMPANY
NEW YORK CITY, Jan. 16, 1917.

To the Editors:

It has pained me extremely to learn of the death of Mr. Stott. In his death the company has lost an invaluable officer, in whose judgment and integrity it had the greatest confidence. His pre-eminent ability was universally recognized. His personal character was such as to endear him to all who knew him.

THEODORE P. SHONTS.

NEW YORK CITY, Jan. 18, 1917.

To the Editors:

The death of Henry Gordon Stott is a great personal loss to hosts of friends and acquaintances who had been drawn to him and who esteemed him most highly. He had all that was necessary to inspire admiration, command respect, and win friendship in the wide circles of professional, business and social life in which he mingled. A sterling character, a well-trained and balanced mind, evincing marked strength, originality and individuality, animated by the spirit of progress and of growth, controlled by a judicial temperament, sweetened by great kindness of heart and amiability of disposition, sustained by the desire to give help, do a favor, or cause pleasure to all with whom he came in contact—these were some, though not by any means all, of the prominent traits and characteristics of the man whose loss is mourned.

Beyond this zone, composed of those with whom Mr. Stott came in personal contact, there is a still greater zone, reaching out to great distances in the widest circles of professional work, in which the death of Mr. Stott will also be felt and regretted. The same qualities of mind which had endeared him to his friends and commanded their admiration, availed him in the important part which he played in the evolution and development of the art of generating electric power on a large scale in central stations. His career as an engineer showed that he possessed quite remarkable powers of adaptability and assimilation. It is most interesting to note that while his early technical training was specially directed to and his experience was obtained in the particular field of electrical engineering in which electrical energy is generated and handled in most minute quantities and by the most delicate methods, namely, the field of ocean-telegraphy, he found his way, by successive stages, into the field where electrical energy is generated and handled on the largest possible scale. In this larger field he witnessed a rapid growth from methods of electric power generation of relative crudity and woeful disregard of economy, to methods of the most scientific character, designed, operated and controlled with the most minute care and the highest scientific precision. It is precisely here that his early education and especially his high respect for methods of accurate measurement proved most useful elements of his professional success. He had so well learned to understand and to appreciate the importance of economy when dealing with the receiving and distributing end of electric power circuits in which the greatest care was taken to save fractions of a per cent of energy by eliminating or reducing losses, that he appreciated and realized, perhaps better than any other power station engineer, the benefits which might be derived from the application of similar methods of careful, painstaking precision at the very point where by far the greatest loss occurs, namely, in the boiler room.

The electric railway industry will owe him a debt of gratitude for having emphasized so often and so strongly as he did the importance of boiler room economy. The important contributions of Mr. Stott to the development and improvement of distribution systems, especially in connection with the use of high-tension currents in cables, are overshadowed by his important contributions to the problem of cheapening electric power. The importance of low cost of power generation and distribution in the electric railway industry brought the work of Mr. Stott into well-deserved prominence, which was all the greater because the electric traction system of whose power supply he had charge was the largest in the world. It may be said that he was, perhaps, the greatest contributor of his time to the important science of central station economics. This was realized by many of his colleagues while Mr. Stott lived. Some of us did not hesitate to give him credit for his valuable efforts in this field. I am very glad to realize, at this time, that Mr. Stott's work received at least a certain amount of appreciation during his life. I find great satisfaction in being able to quote, from the Transactions of the American Institute of Electrical Engineers, the following extracts from remarks made by myself, with reference to some of Mr. Stott's epoch-making papers:

"I think it is safe to say that if it were not for the fact that electrical engineering as an art has made so much progress there would be as much blundering and empirical work in the use of coal and in the generation of power generally as there was in the good old days of the so-called age of steam, fifty years ago, which preceded the electrical age, or before electricity or electrical engineering came on the scene. It was the electrical engineer who first learned to measure power systematically and correctly. It was he who first made general use of instruments of precision inside a power station, and, after he had made a great success with his methods of precision-measurement in his own department, in the dynamo room, he found it desirable to go into the boiler room and repeat the same success there, in doing away with the old, crude, rule-of-thumb methods. Mr. Stott himself was one of the first men who preached that doctrine after having practised it himself with very gratifying results; and the men who are following his example are precisely the ones who are in the front rank as experts in power station management and economy."

* * * * * * * * *

"I consider that the Institute is to be congratulated again in having a paper of this kind from Mr. Stott. It is especially to be congratulated upon the fact that all of Mr. Stott's papers on central station economies have been read before the Institute. You do not appreciate that now so much as you will a few years from now, when you look back and see the evolution of central station economics and come to realize that Mr. Stott is the man who really put the matter on a sound basis. Some of his papers will then be recognized as classics, and we will appreciate their value. A few years hence engineers will look upon Mr. Stott's papers with the same high respect that is shown the classic writings of Rankine."

I dare say that if Rankine himself were alive to-day he would be the first to indorse this tribute of praise to a great American Scotchman, just as he would be overwhelmed by the marvellous improvement in boiler room efficiency which has been attained since his day.

Every central station engineer who had heard of

Mr. Stott, and of his magnificent work in the development of central station economy, will feel as do his friends and admirers, that the world has sustained a great loss, and that it is a great pity that he could not have been spared to continue the series of brilliant investigations and the development of the new ideas in central station design and operation to which he had devoted so much thought and study in recent years.

C. O. MAILLOUX.

UNIVERSITY OF ILLINOIS COLLEGE OF ENGINEERING
URBANA, ILL., Jan. 17, 1917.

To the Editors:

Henry G. Stott was best known to mechanical engineers for his work in power plant design and operation. His perfect familiarity with the details of his problem as an operating engineer and his ability to see with a prophet's vision the tendencies of present-day practice gave potency to his statements concerning the power plant. For example, it was his belief that we have not yet supplied the fire room with all of the facilities or with the degree of attention that it should have. Not long ago, in discussing power plant economies, he predicted that the time would come when owners of power plants would be willing to pay more to the man who operates the boiler room than to the man who operates the engine room or the turbine room because of the greater opportunity of the man in the boiler room to effect economies in operating.

While his immediate interest was in the operating of plants, he was never content to follow, without questioning, the easy road of established practice. His opinions were formulated judgments, not intuitive decrees.

I first came to know Mr. Stott intimately many years ago when we were fellow members of an advisory board of the United States Geological Survey on fuels and structural materials. At about the same time we became associated in the work of the council of the American Society of Mechanical Engineers, which society he has served as manager and as vice-president, and also as chairman of a number of its committees.

Whatever the relation, it was always his custom to do his part with thoroughness. While exhibiting no personal desire to have his conclusions adopted, his statement of them invariably attracted attention and they generally prevailed. The fact that he could be depended upon to carry to a successful issue anything that was assigned to him, doubtless has on many occasions placed upon him more than his fair share of the common burden. His scientific methods were emphasized by the whole course of his life. He was among the first to advocate detailed specifications which should govern in the purchase of power plant fuel, and he was one of the first, if not the first, to purchase coal on a heat-unit basis for plants operating under his direction.

As chairman of the committee of the American Society of Mechanical Engineers on standard pipe flanges he devoted himself to the task of harmonizing divergent views of long standing, and so successfully did he accomplish this that the committee's studies under his direction were quickly brought to a logical conclusion. When in connection with this work his committee was publicly criticized and his own action assailed, and when the time given to public discussion had been entirely absorbed by his critics and practically none had been left for him in which to give response, he made no complaint. His interest was in the successful issue of the work and this he clearly saw was forthcoming. His confidence was in the knowledge of just action and in the ultimate judgment of his friends.

W. F. M. GOSS,
Dean of the College of Engineering.

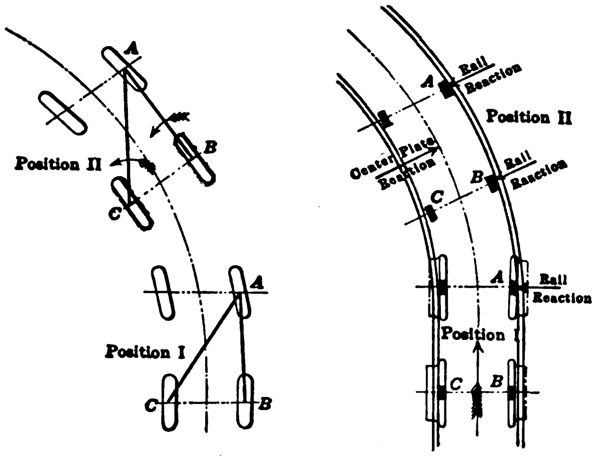
Mechanical Design of Electric Locomotives

NEW YORK CITY, Jan. 12, 1917.

To the Editors:

In connection with the discussion on the subject of mechanical design of electric locomotives appearing in recent issues of the ELECTRIC RAILWAY JOURNAL, I should like to call attention to two points that ought to be made clearer. One is that it is unnecessary to consider that a two-axle locomotive truck swings about either the inner rear wheel or the outer rear wheel when the locomotive is passing around a curve. The truck, under these circumstances, has, with reference to the locomotive frame or body, rotary motion about the truck center pin. The motion with reference to the track or ground is a compound motion of translation and rotation.

As an example demonstrating this condition may be taken the simple case of a four-wheeled automobile traveling upon a curved course on a highway. It has two motions: Translation, as from position I to position II shown in the accompanying illustration; and in addition, it has a motion of rotation, just as a locomotive truck swings on its center pin. Does point *A* swing about point *B* or about point *C*? Draw the vectors (radii) *BA*, *CA*; notice their relative directions in the two positions of the vehicle. It will be seen that, on this curve to the left, both vectors have swung to the left, or counter-clockwise, viewed in plan. Obviously point *A* swings to the left about *B*, or *C*, or in fact, about any other point back of it.



FIGS. 1 AND 2—DIAGRAMS SHOWING ACTION OF AUTOMOBILE MAKING TURN AND ENGINE TRUCK ROUNDING CURVE

The second point that I wish to bring out is that, unless a great deal of resistance to swivelling is introduced at the truck center, it is inevitable that both outside truck wheels of a two-axle locomotive truck must hug the outside rail. This fact is brought out in the second illustration. In position I the locomotive truck is shown entering a curve. Here the rail pressure at *A* tends to rotate the truck about its center pin. At position II, where the truck is entirely on the curve, the truck has rotated about its center pin with reference to the body. The result is that *B* also is brought into contact with the outer rail, which is here curved. At both *A* and *B* the rail exerts a pressure to the left, which is opposed at the truck center plate by the inertia or centrifugal force of the locomotive body acting toward the right. An automobile skids bodily sideways on a smooth greasy or icy roadway when its driver tries to make it curve, and this is what the locomotive truck is trying to do under the influence of the thrust at its center plate.

The rail at both *A* and *B* is resisting the tendency of the truck to skid toward the right, and in combination with the forward propelling force, also exerted at the center plate, is compelling the truck to proceed around the curved path.
HENRY JAMES KENNEDY, M.E.
Electric Railway, Power and Industrial Plant Engineer.

Cutting Costs in Storage Yards

NEW YORK STATE RAILWAYS
ROCHESTER, N. Y., Jan. 10, 1917.

To the Editors:

R. C. Cram, in his article on "Cutting Costs in Storage Yards" in your Dec. 23 issue, has touched upon a very important item in the operation of any electric railway and the article and photographs are worthy of considerable study.

In general there are certain features of a storage yard which it would seem could be classified, and each of which would contribute toward the cutting of costs in the operation of the road.

The first of these would be the design of the yards. This design would cover the connections with steam roads and water facilities, as well as the general track layout and plan for the location of materials, buildings, etc. When property has been purchased for this purpose, a plan should be prepared which will represent the ultimate layout and then such portions as are immediately necessary could be constructed and additions made to conform to the general plan as conditions require. The general design should also take into consideration the type of equipment which is to be used.

This brings us to the second item in cutting costs, which is referred particularly to in Mr. Cram's article, that of equipment. It is a generally admitted fact that human horsepower at any reasonable rate of pay is the most expensive kind of power purchased. Mr. Cram's article refers more particularly to the use of derricks, cranes, etc., than to any other type of equipment, although there are other things which could be worked to advantage. For instance, it might be advisable under certain conditions to use a trestle track with bins for the storage and handling of such materials as crushed stone, gravel, sand, coal, etc. Another scheme for the handling of such material, which has been in use on this property, is a temporary track, the stone or coal being unloaded in the track and on either side, the track then being jacked up on top of this material. As succeeding cars are unloaded the track becomes in effect a trestle track so that by using the bottom dump cars it is possible to unload them from a track of this sort with comparatively little labor, most of the stone going out and rolling down the embankment. This scheme has resulted in dividing by two the cost of unloading crushed stone and coal. There are also other types of equipment which can be used such, for example, as roller conveyors. The use of these is especially advantageous where material has to be piled at some distance from the track.

The third item of saving in a storage yard touched on in Mr. Cram's article is the storage of material which can be purchased at favorable times, although there is considerable danger in this on account of the liability of over-stocking. Another saving which is obtained from maintaining the supply of material is the elimination of possible delays to construction work due to the lack of material.

The fourth item and one which is very important is the organization for the handling of materials in the yard. The centralization of material receipts and disbursements obtained by means of the yard makes possible the maintenance of a permanent organization for this type of work.

There are also a great number of small ways in which a storage yard can be made useful. For instance, we have on this property a pile of materials, especially old special work, which we call our "scrap stock." Switches, mates, frogs, etc., which are removed from the track on account of changes in layouts and which are not entirely worn out are put upon this pile. Lists and records are kept in the office so that in case, at any future time, an opportunity arises where it is possible to use this material it can, by means of the office records, be located for use again. A saving of this sort would not be possible unless storage yards having sufficient capacity for this purpose were provided.

In general Mr. Cram's article touches upon one phase only of a very fruitful source of saving; that is, the saving which can be effected, especially in way departments, by the use of labor saving devices.

D. P. FALCONER,
Engineer Maintenance of Way.

Advertising in Company Publications

THE KANSAS CITY RAILWAYS COMPANY.
KANSAS CITY, MO., Jan. 16, 1917.

To the Editors:

Referring to your request that I submit my ideas concerning the question of advertising in company publications, I hand you the following:

The publication which this company established, known as *The Railwayan*, was primarily for the benefit of our employees and was intended to be a medium through which the employees could interchange ideas and thereby create a closer feeling of relationship between the employees themselves as well as between the employee and the company. The company wished to furnish this publication free to the employees and at its own expense, and I feel that any attempt to advertise in the publication would not only detract from its present standing among the employees but would also have a tendency to place the same upon a monetary basis, the exact position which we are seeking to avoid. As soon as this publication was first issued there were a number of inquiries made from prospective advertisers seeking to secure space, but we have refused absolutely to consider the same. There is no doubt but that the company could, by accepting such advertising, pay the cost of maintaining our publication, which runs into a considerable amount of money.

I cannot but feel that the insertion of advertising in such a publication would destroy its personality and also lessen the interest of the employee in the same.

PHILIP J. KEALY, President.

"Special Work"

BROOKLYN RAPID TRANSIT SYSTEM
BROOKLYN, N. Y., Jan. 17, 1917.

To the Editors:

The term "special work" is used freely by way engineers and others, and yet if even a specialist is asked to define what he means by the term he will probably be at loss to do so. It is particularly important for purpose of classification of accounts to know just what is meant by special work so that the parts of a track system may be suitably divided. As a contribution to this subject, and in the hope of bringing out further suggestions, I offer the following as a possible definition:

"Special work is that part of the track structure which is required for changing the direction of rolling stock or for carrying it over an intersecting track structure lying within the same plane. Plain curves without guard rails are excepted from this definition."

Under the first part of the above definition would be included plain and reversed curves, turnouts and crossovers, branch-offs and connecting curves. Under the latter part would be included crossings of every description, straight and curved, right angles and acute.

M. BERNARD,
Assistant Engineer Way and Structure Department.

The Industrial Survey in Routing Studies

Information Regarding the Natural Lines of Travel of Industrial Employees to and from Work Furnishes a Logical Basis for Routing

BION J. ARNOLD has forwarded to the Rochester, N. Y., Chamber of Commerce a supplement to the report on local traffic conditions which was abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 16, 1916, page 1238. The supplement deals particularly with the results of the industrial survey made in connection with the preparation of that report, and with an analysis, by industrial and residence districts, of the results of that survey. As the industrial survey is a new factor in routing studies, a brief analysis of the supplement to the Rochester report is given below.

In the survey data were collected showing the residences and places of employment of nearly 23,000 persons, and these data were represented upon maps, of which a sample was presented in the abstract referred to. The purposes of the study were to determine the distribution of residence of persons working in the several factory districts with relation to the car lines operating near their homes, and the identification of the locality of employment of persons residing in the territory tributary to the several lines.

The territory tributary to a car line was assumed to be a strip ¼ mile wide on each side of the tracks. The territory considered did not extend into the business district, where all lines converge, but included only residence territory tributary to one or a comparatively few lines. It was found practicable to isolate for study a number of well-defined districts, each of which was considered separately in respect to the transportation facilities.

By this plan it was possible to determine the "community of interest" between sections of the city and thus to indicate the natural directions for car lines to accommodate industrial workers. This community of interest was examined from two standpoints: that of persons employed in the several industrial districts, and that of those living in the several residence districts. The general procedure can best be seen from actual quotations from the report, which are therefore appended.

SAMPLE OF INDUSTRIAL DISTRICT ANALYSIS

"*St. Paul Street District.*

"From this division there were 2647 destinations reported, distributed as follows:

Northwest	437	Northeast	1786
Southwest	188	Southeast	198
		Suburban	38

"All of the territory is tributary to the St. Paul Street line. As is evident from the above figures, nearly 70 per cent of the persons employed in this district reside in the northeast section of the city, a great many of them living within walking distance of their place of employment. There are, however, a large number living a considerable distance east of St. Paul Street, who probably would be patrons of the car lines, particularly during bad weather, if any direct means of travel between their residence and place of employment was available. But at present in order to reach any of the other northeast lines it is necessary to make a considerable detour going south on St. Paul as far as Central Avenue and there transferring back to a northbound car of another route, which in many cases takes as much time as walking by a more direct route. In a similar manner, practically all of the residents of the northwest section working in this district have no adequate transportation facilities. A crosstown line on Clifford Avenue and Emerson Street would not only be a great convenience to these people, but would probably be a source of increased revenue to the railway company.

"There is no particular community of interest with any other part of the city, South Avenue probably serving as many people as any other line outside of the northeast section."

SAMPLE OF INDUSTRIAL DISTRICT ANALYSIS

"*Monroe Avenue.*

"In the territory selected along this line, 1430 destinations were reported distributed as follows:

Northwest	379	Northeast	325
Southwest	126	Southeast	600

"Aside from persons working in the industrial establishments near Monroe Avenue, there appear to be relatively few industrial employees in that section considering the very heavy traffic carried on the line. A large proportion of the destinations reported were from office buildings and stores along Main Street. Aside from Main Street, State Street, from Lyell to Court, and Clinton Avenue, from Court to Andrew, show the greatest common interest, there being 330 destinations reported from the former and 400 from the latter. In the case of Clinton Avenue, probably a considerable proportion of the destinations reported represent people who walk to and from their work, especially during good weather.

"It is probable, however, that a very large part of the traffic on this line is not to and from industrial plants, which conclusion is further borne out by the fact that the peak load traffic is smaller compared with the non-rush hour traffic than on any other line on the system. For this reason the industrial survey results should not be given too much weight in considering the proper routing for the Monroe Avenue line."

New Safety Association

Twenty-two national societies have united in the forming of the Joseph A. Holmes Safety Association to commemorate and continue the notable safety work of the late director of the United States Bureau of Mines. The function of the association is to further the safety movement by awarding certain medals and honorariums to persons active in developing devices to reduce accidents in the mineral industries, and medals to persons performing notable service in life saving in these industries.

"It Is Safe!"

The Columbus Railroad Company, Columbus, Ga., has placed small frames of picture molding in each of its cars in which "safety signs" are run in series. During December and January the style of these signs has been changed from the old form of "Danger" signs to a "Safe" sign. For instance, instead of "It is dangerous to board a moving car," the sign reads: "It is safe to board a still car," Or instead of "Wait until the car stops," "It is safe to get off a standing car."

New and Up-to-Date Articles on

EQUIPMENT AND ITS MAINTENANCE

First of a Series of Charts Gives Unusually Complete Cost Data on Overhead Construction—Spanish Railway Engineer Describes Devices for Locating Trolley Wire and Hangers—Other Articles Cover a Special Pavement-Cutting Machine, Small Gasoline Motor-Driven Interurban Car, Etc.

(Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.)

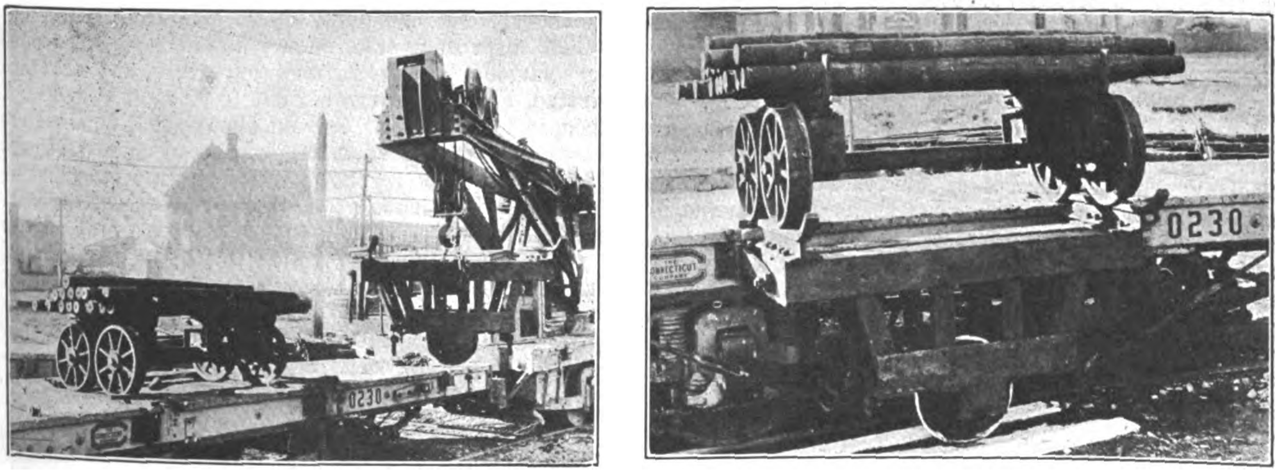
Cutting Long Strips of Pavement

An Inexpensive Machine Made for a Special Job Operates at Low Labor Cost

BY M. E. STARK
Superintendent of Tracks, Connecticut Company, Bridgeport, Conn.

In making repairs on a section of the company's tracks on Fairfield Avenue, Bridgeport, Conn., it was necessary to remove a strip of warrenite pavement, 16,000 ft. long and 2 ft. wide, extending along the outside rails of the double track. To cut away this strip and leave the edge in an unbroken straight line looked like a big proposition, but it was decided that a machine could be built for about $125 which would do the work required. The machine as built is described below.

It consists of a cutting wheel about 20 in. in diameter, formed similar to the wheel of a glass cutter. This is supported on a heavy iron frame which, when in use, is attached to the side of a single-truck trail car by a hinge mechanism to allow for the inequality of the surface of the pavement. This machine can be attached to a car in less than ten minutes and can be detached in about the same time.



MACHINE USED FOR CUTTING PAVING IN BRIDGEPORT, CONN.

In order to get the necessary weight over the cutting wheel to force it through the pavement, a track is laid across the top of the car, upon which a small truck capable of carrying about 2 tons weight of old car axles is placed. When the cutter is in place ready for work this truck is run out on the top of the frame of the cutter, which also has a track for this truck. The car is then pulled and pushed up and down the street a few trips, and the trick of cutting the warrenite is done. Its removal is a very simple matter. A motorman with the crane car and three or four laborers will take this outfit to the scene of action after the last car is off for the night, and will set it up and cut a strip 3000 or 4000 ft. long before the first car starts out in the morning. A gang of twenty-five men working ten hours with picks and chisels could not do half as much, nor do it half as well.

Locating Trolley Wires and Hangers

The Author Describes His "Trolley Square" and Gives Suggestions on the Above Subject

BY R. FINGADO
Seira (Huesca), Spain

As wire and trolley wheel renewals are important items for consideration by electric railway companies, and as the wear and tear on both depend largely on the relative positions of wire and track, it is important that trolley wire be suspended correctly, and its proper alignment maintained. Correct wire location produces minimum tendency for trolley wheels to leave the wire, thereby obviating much trouble and expense.

THE "TROLLEY SQUARE"

The writer has recently devised what he calls a "trolley square," the use of which enables a lineman to locate the trolley wire correctly for all conditions. As shown in Fig. 1, it consists of a frame similar to a track gage, mounting two mirrors, one stationary, the other movable along a guide. Each is inclined exactly 45 deg. and is provided with a conspicuous horizontal center line. Under the movable mirror guide are two scales, one reading the distance from the center in inches, the other being graduated to read the radius of track curvature in feet.

The fundamental principle of the trolley square is shown in Fig. 2. On account of the angular positions of the two mirrors the observer virtually looks upward in a direction exactly perpendicular to the plane of the

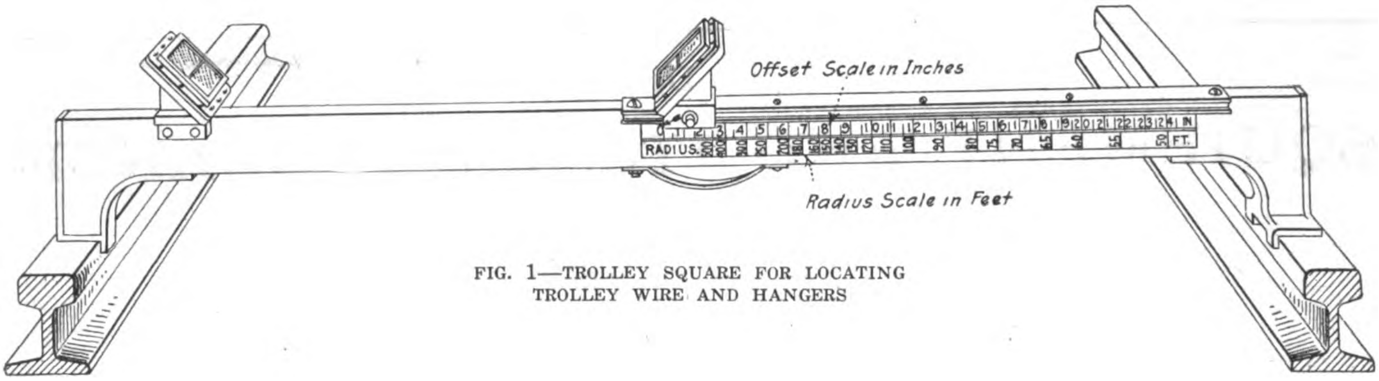


FIG. 1—TROLLEY SQUARE FOR LOCATING TROLLEY WIRE AND HANGERS

rails, at a point determined by the position of the movable mirror. Obviously, then, when the image of any object, such as the trolley wire or a hanger, coincides with the lines on the mirrors the object is in this direction from the line on the movable mirror. The appropriateness of the term "trolley square" is evident from Fig. 2.

With the movable mirror in the correct position, the lineman, by looking into the stationary mirror so the center lines coincide, should see the trolley wire reflected in the same line if it is properly placed. A man on a ladder or tower wagon needs no assistance for aligning the wire, as he can sight from above over the mirror lines and bring the trolley wire to coincide with them. The tool weighs only about 15 lb. and is easily carried for inspection purposes by the leather strap provided. The writer has been granted letters patent on this device.

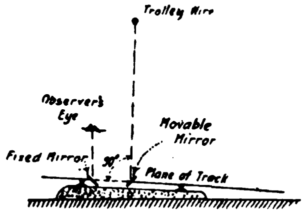


FIG. 2—DIAGRAM SHOWING PRINCIPLE OF TROLLEY-SQUARE

CORRECT LOCATION OF TROLLEY WIRE

Trolleys suspended with the aid of a plumb-bob will very often be found vertically over the center of the track, which is incorrect on curves and on tangents where the rails are not horizontal, as for example on streets having a curved surface. On tangents the trolley wire should be located centrally and in a line perpendicular to the plane of the track, except with pantographs or bow trolleys where the correct zig-zagging of the wire is very important. When using the trolley square on tangents the movable mirror is set over the center of the track, *i.e.*, at zero on the inch scale, but if staggering is desired it is moved along the guide the required distance and the wire is offset the same amount.

When rounding curves the trolley pole should be tangent to the curve described by the trolley wire. The correct position of this curve is not directly over the center line of the track, but depends upon the location of the trolley base on the car, and also upon the amount of elevation of the outer rail. When using the trolley square on curves or spiral track the movable mirror is set at the proper point on the radius scale.

The relation of the two scales to each other depends on the type of car being operated. The distances by which the trolley wire should be offset are first found for various radii of track curvature and are then plotted, giving a curve similar to *A*, *B* or *C* in Fig. 3. In case two types of cars in about equal numbers are operated over the same track a mean curve as shown should be drawn for both. The distance *D* is that by which the wire should be offset by means of the inch-offset scale of the trolley square. With a proper curve in hand, corresponding values of *R*, the track radius, are read for several values of *D* and are then marked on the radius scale.

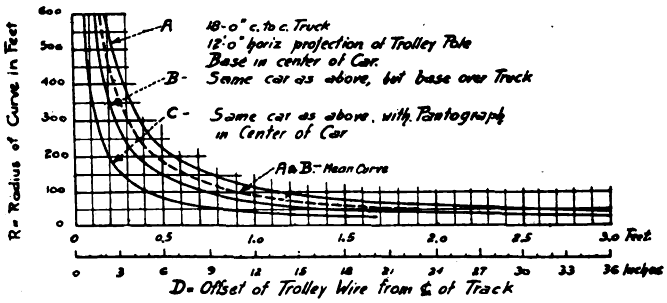


FIG. 3—SAMPLE CURVES GIVING DISTANCES TO OFFSET TROLLEY WIRE

To determine values from which these reference curves are plotted, the trolley wire and trolley pole are projected upon the plane of the track, neglecting the

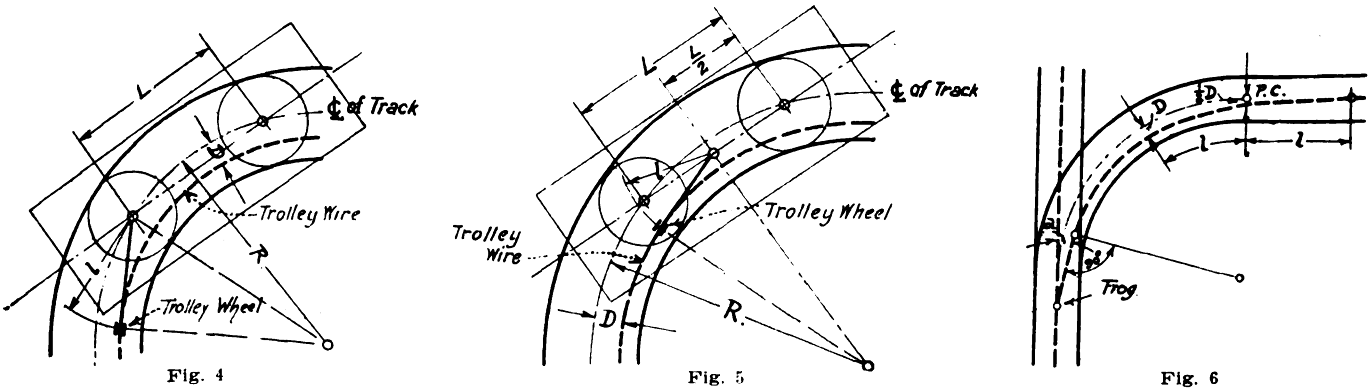


Fig. 4

Fig. 5

Fig. 6

DIAGRAMS SHOWING CORRECT POSITION OF TROLLEY WIRE—FIG. 4, WITH TROLLEY BASE OVER TRUCK CENTER; FIG. 5, WITH TROLLEY BASE BETWEEN TRUCK CENTERS; FIG. 6, DIAGRAM FOR USE IN LOCATING TROLLEY FROGS offthrow due to the axle distance of the trucks. Fig. 4 shows the position of the wire for the simple case when the trolley base is over a truck center.[1] The distance *L* from center to center of trucks has no influence on the displacement of the trolley wire. Fig. 5 shows the position of the wire when the trolley base is midway between truck centers.[2] This calculation is also simple since *L* and *l*, the horizontal projected length of the trolley pole, are constant for a given type of car. With

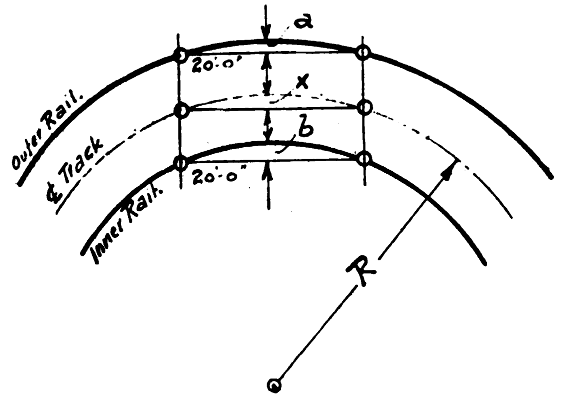


FIG. 7—DIAGRAM SHOWING HANDY METHOD FOR DETERMINING RADIUS OF TRACK

a pantograph *l* would be zero, and values of *D* for this case would be different.[3] If the pantograph is placed over a truck the trolley wire should follow the center line of the track. Fig. 6 shows how the wire should be hung at the entrance to a curve. The frog should be so placed that the line given by its angle *a* is tangent to the curve described by the wire, which is offset by the values found as explained above.

To determine *R*, the track radius at any point, a simple method can be used as shown in Fig. 7. The distance *x* between the center line of the track and the middle point of a 20-ft. chord is first found by taking the mean of similar distances as *a* and *b* determined by chords of equal length measured on the two rails. Then

$$R = \frac{50}{x} + \frac{x}{2}$$

If *x* is very small as compared with *R*, the second term in the above formula may be omitted. If it is expressed in inches, *R* is approximately $600/x$.

The trolley wire can be made to follow closely its theoretically correct curve by close spacing of the hangers, which is especially necessary on curves of

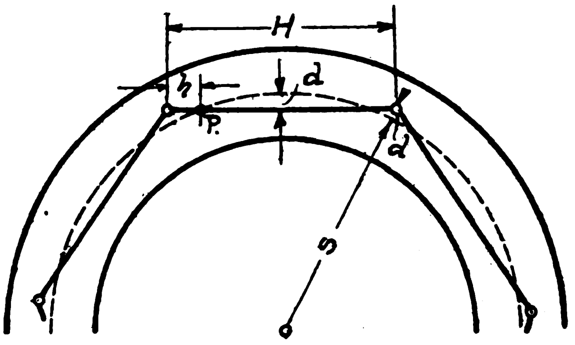


FIG. 8—DIAGRAM FOR USE IN LOCATING HANGERS

short radius. Referring to Fig. 8, the distance *d* must be the same on both sides of the theoretical curve of the wire and should not exceed a predetermined maximum. Its value[4] depends on *H*, the hanger spacing, and upon *S*, the radius of the correct curve for the wire at the point where the hanger is being placed, assuming an arc of a circle between hangers.

The length *h* from the hanger to the point *P*, where the trolley crosses its theoretically correct position, can be calculated[5] but it is found to have an approximate relation to the distance between hangers, *viz.*, $H = 6.9 \times h$. This relation is plotted for various

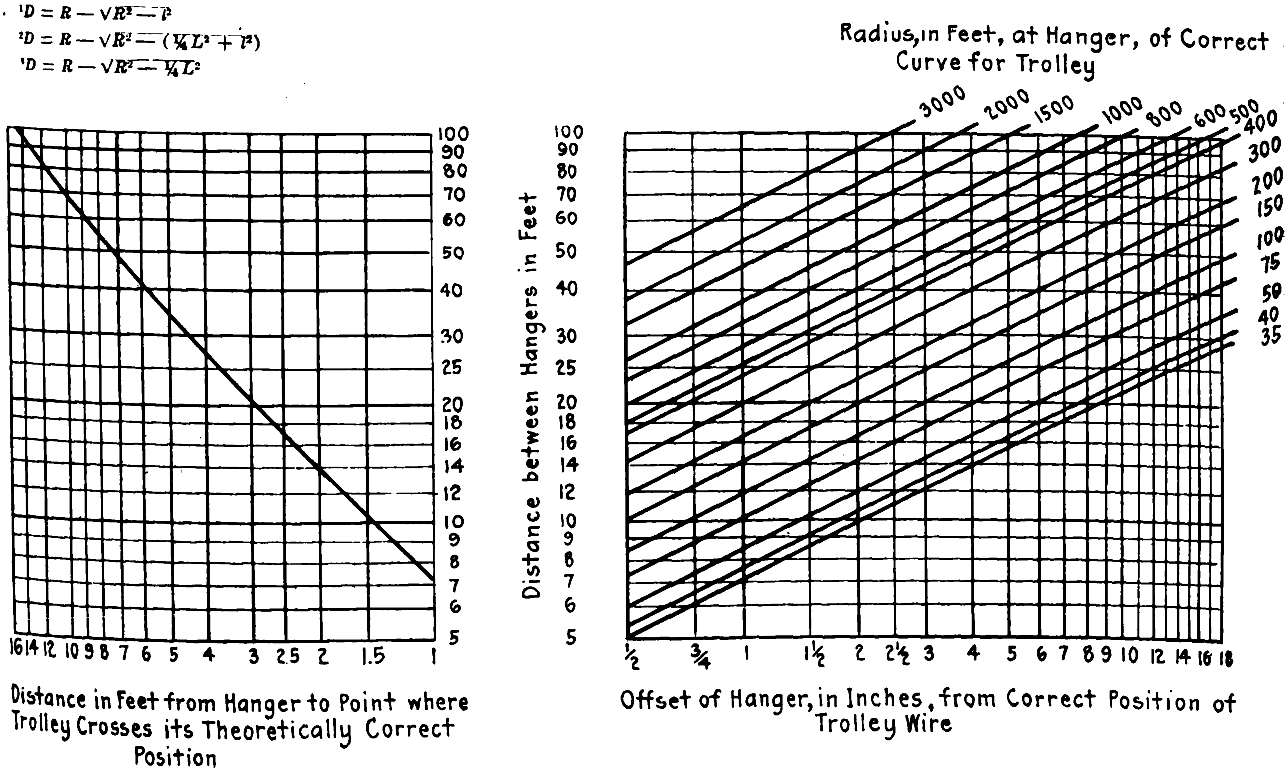


FIG. 9—CHART FOR USE IN LOCATING HANGERS

values of H on the left-hand portion of the chart shown in Fig. 9. The remainder of the chart gives values of d for different degrees of track curvature. This can be used for locating hangers in conjunction with the trolley square. The position of the trolley is first found with the latter and the distances d to offset the hangers may be read from the chart. The accuracy of the suspension may be checked by comparing the distance h with that given on the chart, the point P being determined with the trolley square.

---

[1] $D = R - \sqrt{R^2 - l^2}$

[2] $D = R - \sqrt{R^2 - (\frac{1}{4}L^2 + l^2)}$

[3] $D = R - \sqrt{R^2 - \frac{1}{4}L^2}$

[4] $d = \frac{H^2}{16S}$

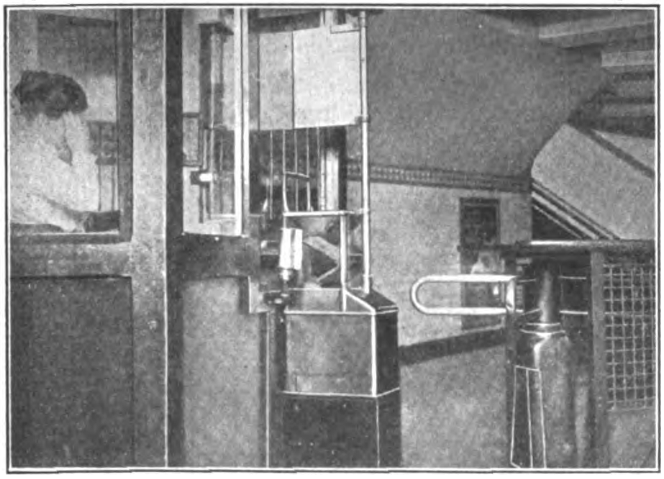
[5] $h = \sqrt{4dS} - \sqrt{2dS - d^2}$

Combining Fare Box and Turnstile Service at Boston

Plan Used on Boston Elevated Railway to Reduce Fare Collection Costs by Use of Mechanical Devices

Important economies are being secured by the Boston Elevated Railway in three trial installations of International motor-driven station registers used in conjunction with turnstiles at those subway and elevated stations where the volume of traffic is not large enough to warrant the employment of a coin inspector in addition to a change maker. About one-fourth of the stations on the Boston Elevated Railway are in this class. The other stations are already equipped with motor-driven station registers of the same manufacture, as described in the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 8, 1916, page 77.

The accompanying halftone illustrates a recent installation by the company in which the functions of fare box and turnstile are combined in such a way as to eliminate the usual gateman. In the view shown, which was taken in the Boylston Street station of the Washington Street tunnel, a five-arm turnstile manufactured by the H. R. Langslow Company, Rochester, N. Y., occupies the usual position opposite the change booth. In front of the latter the coin register is located, with a 10-watt reflector lamp mounted at the side so that the attendant in the booth can watch the coin cylinder rotation in connection with the unlocking of the turnstile. When the latter is locked a space of about 2 in. is left between the fare box and the end of the arm, but when the turnstile is released the space between the top shield and the fare box is about 18 in. wide.


FARE BOX USED WITH TURNSTILE AND CHANGE MAKER

The entire supervision of the fare box is transferred in this installation to the change maker, who also collects transfers. The passimeter records every passenger entering the station past the booth; the fare box totals the cash passengers, and the difference is the number of transfers collected. In various other installations where no turnstile is in use, passengers tendering transfers are admitted after handing them to the gateman, and no mechanical check upon the transfer is available. Two gatemen are eliminated by the combined use of the fare box and turnstile at each entrance, one man being eliminated per shift.

The coin cylinder in the fare box can be stopped by a button in the change booth if the change maker wishes to scrutinize any coin closely, and a switch is also provided for stopping and starting the motor. The automatically-locked coin box is in a cabinet at the bottom of the box. According to the volume of traffic at a station each change maker is supplied with from $50 to $100 in change each morning, the remainder being collected at night.

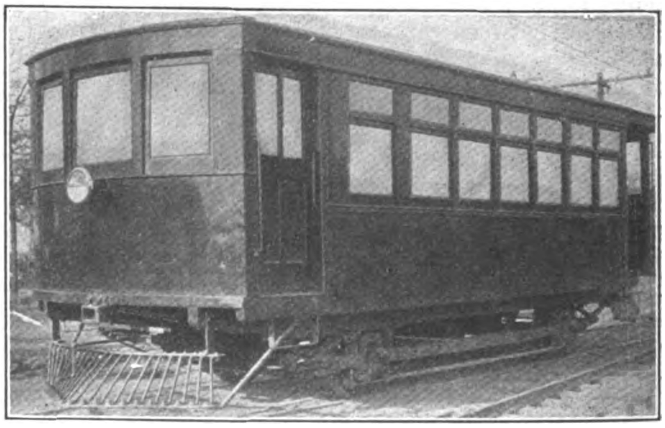
Car Built in Small Shop Is Driven by Automobile Motor

BY J. A. HILL

Superintendent of Equipment and Maintenance Fairburn & Atlanta Railway & Electric Company

An automobile engine furnishes power for the railway car shown in the illustration on this page. The car was built in the small machine shop of the Fairburn & Atlanta Railway & Electric Company, according to the design of the writer.

The motor, which was taken from an old Mitchell automobile, has six cylinders, 4¼ in. by 6 in. Automobile transmission gears are used, giving three forward speeds and one reverse. The car turns on Y's at each end of the line. It is mounted on a Brill 21-E truck, which was sawed in two and lengthened by inserting a section of angle iron to make the wheelbase 12 ft. long. The body is 8 ft. wide and 26 ft. long, including one 4-ft. platform and a 7-ft. engine room. The total seating capacity is twenty-eight.


INTERURBAN CAR DRIVEN BY OLD AUTOMOBILE ENGINE

The car runs from Fairburn to College Park, a distance of 10.6 miles, making the trip in forty minutes, including the time required for ten stops. For eight round trips, about 168 miles, 18 gal. of gasoline and 2½ gal. of lubricating oil are required.

In a recent issue of the Newark, N. J., *Sunday Call* there was given an extensive and well-illustrated article on the Plank Road Shops of the Public Service Railway. The article described in detail the several departments of the shops, giving statistics as to floor area, men employed, etc. One of the illustrations was an outline bird's-eye view of the entire shop property and adjoining tracks.

Cost of Erecting Overhead Work—I

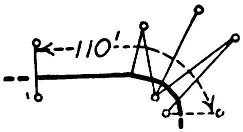
(From the records of a large Eastern company)

The following is the first group of a series of diagrams with cost figures to show actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. Each group, as published, will be printed on only one side of a leaf so that readers may cut up the pages for their data books.

The data in each case include a simple diagram, a brief description thereof and the three sets of labor and trucking costs. It may be pointed out that the average lineman was paid $3 a day and his foreman (gangs varying from five men to six men) $4 per day. The company uses both auto trucks and horse-drawn vehicles.

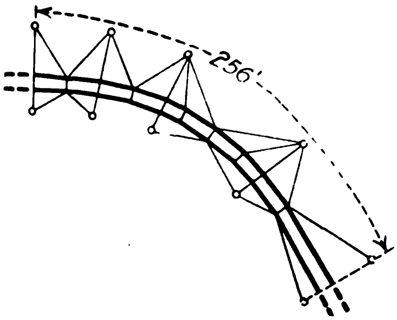
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Single track, plain curve, angle 90 deg.



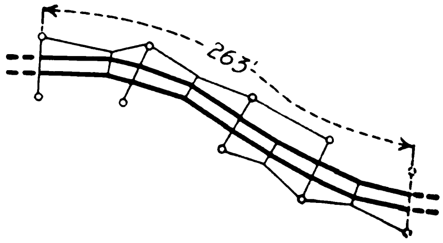
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
1	$7.98	$3.30	$12.76	$5.28	$15.95	$6.60

Double track, plain curve, angle 60 deg.



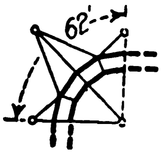
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
3*	$18.15	$13.20	$21.78	$15.84	$25.41	$18.48

Double track, reverse curve



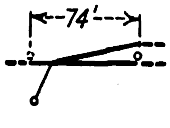
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
2*	$14.52	$10.56	$18.15	$13.20	$21.78	$15.84

Double track, plain curve, angle 90 deg.



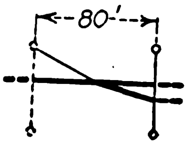
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
4	$9.57	$3.96	$12.76	$5.28	$15.95	$6.60

Left-hand turnout



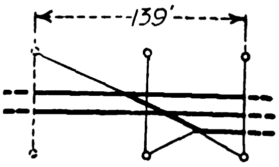
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
5	$9.57	$3.96	$12.76	$5.28	$15.95	$6.60

Right-hand turnout



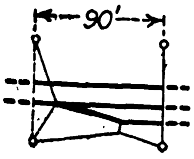
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
6	$7.98	$3.30	$11.17	$4.62	$14.36	$5.94

Right-hand turnout crossing, single track to siding



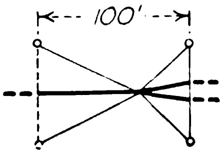
	Light		Ordinary		Congested	
No	Labor	Trucking	Labor	Trucking	Labor	Trucking
7*	$18.15	$13.20	$21.78	$15.84	$25.41	$18.48

Right-hand turnout to siding



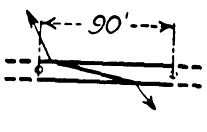
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
8	$15.95	$6.60	$19.14	$7.92	$22.33	$9.24

Diamond turnout



	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
9	$7.98	$3.30	$11.17	$4.62	$14.36	$5.94

Right-hand crossover



	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
10	$9.57	$3.96	$12.76	$5.28	$15.95	$6.60

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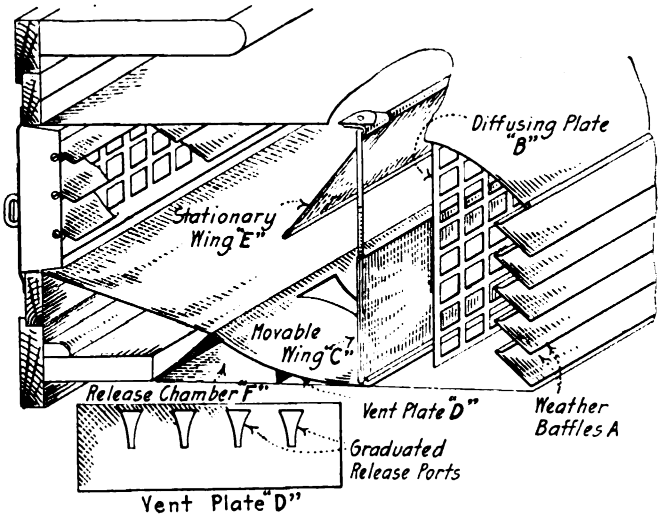
*Trucking includes cost of extra reel truck. The figures not starred do not include cost of superintendence and engineering.

A Natural Ventilating System Adjustable for Speed Variation

A new intake ventilator is the feature of the system of ventilation being advocated by the Railway Utility Company of Chicago. The complete system comprises a means of natural ventilation whereby the air is taken in through this new patented automatic intake in the car roof at the front end and is exhausted through Utility exhaust-type ventilators along the sides. The readers of this paper are familiar with the design and construction of the Utility exhaust-type ventilators, as they have been described and in use for about four years.

The intake ventilator is a new development in the natural ventilation field, its principal feature being a movable wing which is designed to compensate automatically for the variations in car speed and thus to permit a uniform flow of fresh air into the front end of the car. One of these devices is located at each end of the monitor deck, or in a corresponding position on an arch-roofed car, the one at the front end acting as an intake and the one at the rear end as an exhaust ventilator.



INTAKE VENTILATOR WITH MOVABLE WING WHICH COMPENSATES FOR SPEED VARIATION

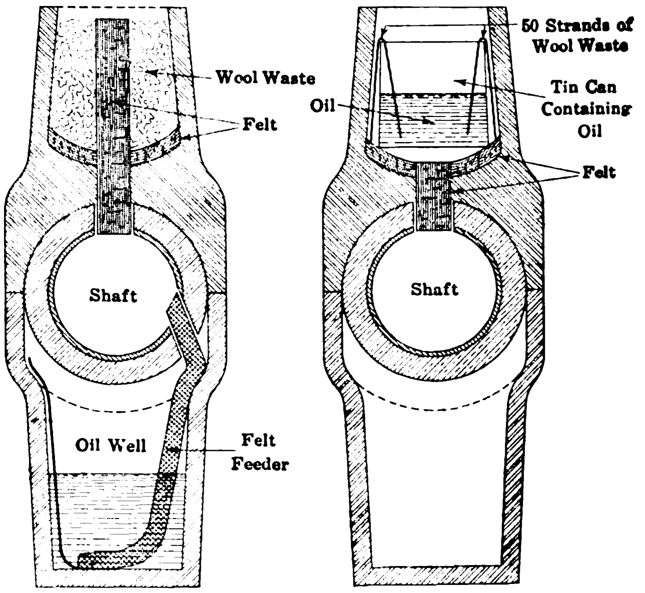
Referring to the accompanying drawing, it is seen that the air enters between a number of baffle plates, *A*, which are designed to exclude rain or snow. Just behind the baffle plates is a vertical diffusing plate, *B*, which tends to equalize the air pressure beyond it. Passing through this, the air strikes and passes over the movable wing *C*, then under the stationary wing *E* and through the grille into the car. As the car moves forward the inrush of air causes a pressure on the front of the movable wing and forces it backward, reducing the size of the opening between it and the permanent partition *E*. The position of the movable wing is thus largely dependent on the speed of the car. As it is forced backward it reduces the opening into the car to compensate for the increased pressure, and is said to admit a practically uniform quantity of air under all conditions.

Below this movable wing is a plate *D* in which are cut four vent openings. These ports in the vent plate are graduated so that the opening is increased as the movable wing is forced farther back. This releases a part of the pressure to the chamber *F* and thence to the atmosphere, tending to hold the movable wing more steady, and to prevent it from constantly moving back and forth. At a speed of about 15 m.p.h., the ventilator ceases to operate, the leakage in the car then giving sufficient ventilation. The intake is designed to admit about 15,000 cu. ft. of air per hour, while the leakage factor of approximately 25,000 cu. ft. of air per hour makes a total of 40,000 cu. ft. per hour.

In view of the fact that the Department of Health of the city of Chicago has approved this ventilating system as conforming to the requirement of the ordinance that the carbon dioxide content in a car be kept below twelve parts to 10,000 parts of air, the Chicago Surface Lines has placed orders for installing this system of ventilation on all its cars except those now equipped with mechanical systems of ventilation. About 1920 cars will be equipped each with two intake ventilators, eight exhaust-type ventilators and the thermostatic heat control. The orders include a total of 15,396 Utility Honeycomb exhaust-type ventilators, 3840 intake ventilators, 1144 round vestibule-type ventilators, and 2302 Utility thermostatic regulators for controlling the heating current.

Lubrication of Old-Type Motors Improved

The lubrication of the old-type motors of the San Antonio (Tex.) Traction Company has been improved, and the money spent for oil has been greatly reduced by a novel system developed by Henry Fink, master mechanic of the railway. The accompanying illustration shows the alterations made in the method of feeding the oil to the bearing. In the new scheme the oil is held in a tin container which fits into the stuffing box over the bearing. Strands of woolen waste feed the oil over the brim of the container and down to the felt pad, which in turn conducts the oil to the bearing. The oil-well under the bearing is not used.



SECTIONS SHOWING OLD AND IMPROVED METHODS OF LUBRICATING OLD-TYPE MOTOR BEARINGS

After a considerable amount of experimenting it was determined that about fifty strands of woolen waste would provide the proper constant supply of oil to the bearing. This number was used, and the scheme has been in successful operation for a year. With the old system the bearings were filled with oil every night, and the lubrication cost per 1000 car-miles was about 25 cents for double-truck cars. With the improved method of lubrication the cost per 1000 car-miles has been reduced to 16 cents.

News of Electric Railways

Traffic and Transportation

Financial and Corporate Personal Mention Construction News

Cleveland Problem Acute

Congestion in Public Square Grows—Papers Protest Against Service Dominated by Idea of Preserving Three-Cent Fares

The transportation problem in Cleveland, Ohio, has become acute. It is perhaps impossible for the Cleveland Railway to operate many more cars, with the Public Square as a terminal for all lines. Moreover, the addition of cars during the rush hours would add greatly to congestion and increase appreciably the expense of operation, something which all city officials wish to escape, because it would mean an increase in the rate of fare. Apparently the city authorities feel that the elimination of congestion in the business district can be brought about only by the use of underground tracks that will emerge to the surface well out of the busy zone, and several officials have expressed themselves as favorable to this plan. Mayor Harry L. Davis, however, is opposed to placing the ownership of underground lines in the hands of a private corporation, unless the Cleveland Railway will undertake their construction on the basis of the Tayler franchise. He feels that the city should build the subways and lease them to the railway.

The renewal of the franchise of the Cleveland Rapid Transit Railway is in the hands of the City Council. This company, in order to retain its franchise, was to have spent at least $500,000 in preliminary construction work by February, 1917. This has not been done, and there is opposition among the city officials and members of the Council to making a renewal of the present rapid transit grant to the company.

In discussing accidents and delays to service, the Cleveland *Leader* on Jan. 15 said:

"The traditional 3-cent policy of running only enough cars barely to carry the traffic has been stretched to a point where a rush-hour ride in a Cleveland street car has become an ordeal of discomfort, indecency, suffocation, infection, exhaustion, and danger to life and limb. Whether all this results from failure on the part of the company, the street railway commissioner, the city administration, or the City Council, or whether it is the best that can be had for 3 cents in these times, the people have a right to know. Because they have full power to apply the remedies, they will very soon insist on being told."

In order to secure relief from the long hauls, Mayor Davis is inclined to agree with Fielder Sanders, street railway commissioner, who suggested recently that a proposition be made to the Nickel Plate Railroad to build electric railway tracks on its right-of-way for service to East Cleveland and Lakewood, either by operating the cars itself or by leasing the tracks to the Cleveland Railway. O. P. Van Sweringen, chairman of the board of directors of the Nickel Plate Railway, said a proposal would find the company in a receptive mood.

Councilman J. E. Smith has suggested that the 3-cent fare be limited to an area of 5 miles from the Public Square. This may be brought up in connection with the renewal of the franchise in East Cleveland. The 5-mile line would come close to the western boundary of Cleveland. Mr. Smith contends that the zone system is bound to come, and that it is the only thing that will save the 3-cent fare to any considerable proportion of the population.

The street railway committee of the City Council will report adversely on Councilman Kadlecek's ordinance prohibiting the interurban cars from using the tracks of the Cleveland Railway as an entrance to the city. More than fifty business men appeared at the hearing on the ordinance and entered a protest.

Emergency Petition Denied

Plea of Milwaukee Companies for Eight-Hour Day and Higher Wages, However, Will Be Considered Later on Its Merits

On Jan. 16 the Wisconsin Railroad Commission dismissed the application of the Milwaukee Electric Railway & Light Company and the Milwaukee Light, Heat & Traction Company for increased rates under the emergency clause of the public utilities act. As noted in the ELECTRIC RAILWAY JOURNAL of Jan. 13, the emergency petition had in view the securing of sufficient additional revenue to permit the establishment of an eight-hour day and the payment of increased wages to offset the higher cost of living. In denying the petition, the commission held that no such emergency existed under the public utility law as would warrant its granting the petition at this time. It was said, however, that the questions involved would be considered on their merits when hearings were held on the original petition of the companies for increased fares, this having been filed on Nov. 6, 1915. The new valuation of the companies' property, it was stated, would probably be completed by the commission in about two months, and the original petition would then be taken up. In commenting upon the action of the commission, J. D. Mortimer, president The Milwaukee Electric Railway & Light Company, stated:

"It is clear that in any subject of this magnitude, involving many complicated facts as to cost of service, time is necessary to inquire into and weigh the evidence submitted. It must be remembered in this connection that the Wisconsin Railroad Commission as now constituted is entirely different from the commission which in previous years made a very thorough study of the traction situation, and it is necessarily unfamiliar with the facts as they have been presented in earlier years. This change in personnel of the commission and its staff necessitates a much more elaborate presentation of evidence than would have been necessary if the case could have been presented as a continuation of the previous fare cases, with commissioners thoroughly familiar with every aspect of the case.

"The matter is further complicated by a revaluation of the companies' entire property, now nearing completion, the results of which the commission has expressed its desire to have in its hands prior to giving a final decision on the company's original petition, dated Nov. 6, 1915, for increased fares. While we are disappointed that no relief was granted upon the emergency as disclosed to the commission, we expect to accomplish the same result from the hearings on the merits of the original petition, to be held some time in the near future, and carry out the plans for change in hours of work and the making of allowances in compensation comparable with increases in the living cost."

New York Commission Review

The Public Service Commission for the First District of New York submitted to the Legislature on Jan. 10 its report for the year. The report blames the war and other "unforeseen difficulties" for the failure of the contractors to finish the new dual system rapid transit lines by Jan. 1, 1917, as provided in the contracts. A review of the progress under these contracts was published in the ELECTRIC RAILWAY JOURNAL for Jan. 6, page 47. Other features of the report are a review of the traffic increases in Greater New York and a summary of accidents. Concerning the street railway strike of 1916, the report says the commission has drafted a number of amendments to the public service law, which, if passed, will enable the commission to prevent a recurrence of such a situation.

Commission Discusses Railway Problems

Massachusetts Body Recommends Paving Tax Change—Will Carefully Scrutinize Further Consolidations—Says Improved Service Is Needed

In its fourth annual report to the Legislature, the Massachusetts Public Service Commission discusses the general economic problems of electric railways within its jurisdiction and renews its recommendation for legislation relieving the companies of the present commutation tax by placing all paving work squarely in the hands of municipalities, and by requiring the companies to meet only the reasonable cost of any such work done within their track locations. Referring to the recently decided Bay State Street Railway rate case, the board reviews the difficulties entailed in reaching a decision dealing with a system of this kind, which is a combination of city and rural lines operating in ninety-one municipalities and suffering from a paucity of interurban patronage. The fact that a 6-cent fare is now charged on certain portions of the system and a 5-cent fare on other portions, has caused some complications which may require adjustment at the end of the experimental period of one year. The board is of the opinion that the investigation of the company's operating methods by B. J. Arnold has had, and will continue to have, a beneficial effect on street railway operation throughout the State.

The commission believes that the terms of any further consolidations of street railways must be scrutinized with great care. In the past, the tendency has been to overestimate the virtue inherent in such consolidations and to permit them freely, provided the total outstanding capitalization remained unchanged. The result has been that prosperous companies have frequently taken over companies with low earning power on the basis of an exchange of stock share for share, when these latter properties might have been consolidated on a more favorable basis corresponding more nearly to their market value. In this way the resources of the prosperous companies have at times been spread so thin that their financial strength has been impaired. The board also holds that any further extension of the control of voluntary associations over Massachusetts public utilities should be prevented by appropriate legislation.

The commission states that there is ground for doubt, from the experience so far gained in the cases where it has been adopted, whether the introduction of the 6-cent fare unit is likely to be of great benefit to the average street railway. It is of the utmost importance that every effort should be made to invite additional traffic through faster, better or generally more attractive service and to decrease expenses through improved operating methods. In this connection, type of rolling stock is of particular importance. The economy from large semi-convertible cars or trailers, easy to load and unload, is marked, and it is now possible (under Chapter 671, Acts of 1914) to capitalize temporarily replacements involved in substituting such cars for older types, spreading the charge to operating expense over a series of years. The report states that the economy through proper attention to paint, cleanliness and general maintenance of cars is also marked. Because of the importance of this subject, the commission desires, if it can secure a slight increase in appropriation, to centralize and further develop the inspection of street railway rolling stock throughout the State, making this the special duty of one man. If this plan is carried into effect, the inspector will be expected not only to direct his attention to the cleanliness and upkeep of the cars, but also to keep himself informed as to the progress of car designing and maintenance throughout the country.

Some extension of the right of eminent domain is considered desirable for street railways. The commission believes that it is possible that if a broad power were granted by the general law, companies like the Bay State Street Railway would be able gradually to convert certain existing lines of low earning power into high-speed routes, similar to the one in very successful operation between New Bedford and Fall River.

The report states that the general condition of the street railway properties in Massachusetts continues to be unsatisfactory. The financial condition of the roads, the scarcity and high cost of labor and of material and the delays in delivery of the latter have resulted in few improvements. Recognizing the great need of the companies for capital, the commission admits that rate increases in some cases may be the lesser evil, but believes that the present regulative policy will in the long run lead to the most satisfactory results.

Electrification of West-Side Lines

Form of Agreement Between City and New York Central for West Side Improvement Made Public

A "form of agreement" reached between representatives of the city of New York and the New York Central Railroad was made public on Jan. 16. It was asserted that it disclosed that the road was willing to make what it considered important concessions for the right to carry out its west side improvement, and especially its plans in Riverside Park. The agreement, which contemplates an expenditure by the road of between $60,000,000 and $100 000,000, provides that its rails in the park be completely hidden by roof of subsoil and fill carried over the right-of-way to the waterfront. This arrangement, the road contends, will not only increase the attractiveness of the park, but actually add twenty acres to it. The draft also proposes that the city convey to the railroad properties and easement rights totaling $11,094,381 and receive in return lands owned by the road valued at $4,984,482. The difference of $6,109,899 is to be contributed by the city as its share in bringing about a development which will, it is contended, add greatly to its commercial greatness and railroad facilities.

It is provided that the railroad completely electrify its entire line in four years. All construction work south of Seventy-second Street must be completed within six years. Below the yards at Sixtieth Street it is the intention of the company to operate its trains on elevated structure to Canal Street, and to turn over its rights-of-way on Hudson Street, Eleventh Avenue, etc., below that to the city, in return for property and concessions to be received by the road from the city.

As explained by Controller Prendergast of New York City, none of these provisions can go into effect until the "form of agreement" has been submitted to the Board of Estimate and Apportionment of the city and discussed at additional public-hearings.

Anti-Strike Plan Offered

Senator Cummins Presents Bill as a Substitute for the Newlands Measure

Senator Cummins of Iowa presented to the Senate interstate commerce committee on Jan. 17 a bill designed as a remedy for the conditions that might arise in case of a long-drawn-out transportation strike, and as a substitute for the plan proposed in Senator Newlands's bill giving the President power to take over railroads temporarily in time of emergency, by the use of the military power. Under the Cummins proposal, if a road were tied up by a serious strike or similar cause, the Department of Justice would apply for the appointment of a receiver, who would then operate the road. After three months if the road was still unable to take care of itself, the Government would take over the property permanently.

The committee also discussed on Jan. 17 a bill proposed by Senator Newlands to prevent the physical obstruction of trains in strikes, and another measure suggested by Senator Cummins providing for the investigation of railroad disputes, by a committee consisting of the Vice-President and four Governors of States appointed by the President. The latter was offered as a substitute for the "Canadian disputes act," voted down on Jan. 16, which was designed to prohibit strikes and lockouts during the course of a Government investigation. No vote was taken on any of the suggestions made on Jan. 17.

Plea for Rhode Island Company

Federal Trustee Says Company Cannot Be Run Successfully Unless Relieved of Burdens

Rathbone Gardner, chairman of the trustees appointed by the United States Court to manage the Rhode Island Company, in addressing a public gathering in Providence, R. I., on Jan. 15, declared that the company could not be successfully run by trustees or anyone else, unless it be relieved of some of its burdens or allowed to increase fares. He favored the increased fare proposal. He said in part:

"The present 5-cent fare is evidently inadequate. If it was the proper thing ten years ago, everyone realizes that it is inadequate now. Everything used by a railroad has increased in cost. Wages have gone up and may go still higher. The street railway industry is the only one I know of which, with increased cost of operation, cannot increase the price of its product."

Mr. Gardner said that the company is paying to lessors of its various component lines approximately $1,153,794 as rentals each year. An expert valuation of the company is now being made. Mr. Gardner told of the various franchises and other taxes the road has to pay. In this connection he said:

"Neither the present nor any other administration can continue to run the road in Providence successfully unless relieved of some of its burdens or allowed to increase the present 5-cent fare. At present the company has no means of raising money, as an issue of stock upon a road not paying dividends would not be apt to prove an attractive investment to purchasers. Neither has the company any property upon which a substantial sum of money could be raised. Just what is to be done I do not know. We of the board of trustees have been doing the best we know how, but we are most seriously handicapped."

The company has announced that it is making a systematic study of its car schedules, with a view of making a general shift to better the service. Figures kept by the city's public service engineer show that during the rush hours fifteen minutes are consumed by some cars in making one loop of less than 2000 ft. about the center of the city.

Trial of Strike Damage Case

Verdict of $2,800 Awarded to Railway for Damages to Its Property

All efforts have been unavailing which were made by counsel representing the county of Erie to have Justice Louis W. Marcus in Supreme Court at Buffalo, N. Y., dismiss the action brought against it by the International Railway in an effort to recover $108,410 damages for property alleged to have been destroyed during the street car strike riots in the spring of 1913. Under the decision of Justice Marcus, the county of Erie can be made defendant in the damage action because of its alleged failure to provide adequate protection to the company's property and the International Railway's additional complaint that the county can be held responsible for the company's earnings during the period when service was curtailed.

Scores of witnesses were examined during the first three days of the trial, which was started on Jan. 8. The company has closed its case and Thomas A. Sullivan, former county attorney, who appears for the defense, started the examination of witnesses for the county during the early part of the week of Jan. 15. A great mass of evidence was introduced by James O. Moore, of Norton, Penney, Spring & Moore, of counsel for the International Railways, all of which tended to show that rioting prevailed in the city during the strike period. Newspapermen who gave evidence for the company told of rioters who hurled bricks and stones off the eighteen-story Marine Bank building onto passing street cars. Others told how members of the two regiments of the New York National Guard sympathized with the strikers and rioters and did damage to the company's cars while engaged in patroling the streets and apparently protecting the company's property. Michael Regan, who was chief of police during the strike, testified that the mobs were so riotous that he was unable to handle them, even with hundreds of special police and deputy sheriffs.

Employees of the International Railway testified as to the condition of cars when they left the various carhouses and of their damaged condition when the cars returned. Windows had been broken, vestibules smashed, car bodies damaged and wires cut in all parts of the city. Loyal employees who operated cars during the few days of the strike told how they were intimidated and threatened by strikers and rioters.

Rebuttal testimony was introduced by members of the Buffalo police department who told of specific damage done by strike breakers who were brought to Buffalo by the International Railway.

On Jan. 18 the company was awarded a verdict of $2,800 against Erie County for property damage during the strike.

Report on Omaha Franchise

Attorney for Railway Replies to Demand of City That Portion of System Be Abandoned

John Lee Webster, counsel for the Omaha & Council Bluffs Street Railway, Omaha, Neb., has reported to G. W. Wattles, president of the company, with respect to the claim of the city to the reversion of the property of the Omaha Horse Railway. Mr. Webster suggests several points to sustain the position of the company as adverse to the demand now made upon it, that it vacate certain streets which form the heart of its system. Mr. Webster recites the history of the franchises and the terms under which they were granted, and the fact of the consolidation of the Omaha Horse Railway and the Omaha Cable Tramway into the Omaha Street Railway under the law of 1889. He reviews the organization of the Omaha & Council Bluffs Street Railway, and its succession to the franchises and property of the Omaha Street Railway, and further cites the fact that the city not only acquiesced in the removal and extinguishment of the Omaha Horse Railway's property, but actually ordered that some of it be removed, which order was carried out at a considerable cost to the present company. In his conclusion, Mr. Webster says:

"If the city should undertake to interfere with the property or franchises of the company at the present time, when it is conceded that the company is the legal holder of the franchise granted to the Omaha Cable Tramway, which does not expire until May 22, 1928, this company should insist on the full limit of its rights under the street railway act of 1889, to wit: 'to hold said properties and franchises in perpetuity.'"

Los Angeles Subway Reagitated

Subway agitation has been renewed in Los Angeles, Cal. On Jan. 5 plans were submitted to Mayor Woodman of that city for building a subway to connect the Hill Street station of the Pacific Electric Railway with the Vineyard station, together with a proposal that the railway build a cutoff line from Vineyard station to Highland Avenue, and thence through the Cahuenga Pass to the San Fernando Valley. In discussing the matter, the Mayor said:

"One of the imperative needs of Los Angeles is relief from the congestion of traffic on its main streets. Some years ago steps were taken toward a diversion of the traffic of outside towns by a subway from Hill and Fourth Streets to Vineyard, and distributing from that point.

"For ten years there has been talk of the development of a rapid transit subway, but down to date little has been done actually to realize the project. Millions of dollars already have been expended in acquiring rights-of-way for this subway, and it would certainly seem to be expedient to awaken the project into activity at the earliest possible moment.

"I understand that legal hindrances to the construction of the proposed subway will soon be removed and necessary rights-of-way acquired. The traffic problems of the city have reached an acute stage, so that it seems unquestionably the time to press the development of this subway rapid transit service. It was thought justifiable ten years ago. If it was justifiable then it certainly is many times more so now."

A Plausible Impostor

A warning has been issued by Anton H. Classen, president, Oklahoma Railway, Oklahoma City, Okla., in regard to a man calling himself Chester Williams. This man visited the office of the Oklahoma Railway a short time ago and represented himself as an ex-convict who had reformed and desired to secure work. He had a letter that he claimed had been written by Thomas Mott Osborne, former warden of Sing Sing prison, New York. A certain part of the man's story made Mr. Classen suspicious, and he took the matter up with the Prison Association of New York. The testimony from that organization indicates that the same man, working under the name of George Colgate, had been soliciting funds in St. Paul and Minneapolis. He is said to be "one of the smoothest crooks in the business." Mr. Classen sends this word about him so that other companies may be warned.

Service Suspended in Cleburne.—The Cleburne (Tex.) Street Railway has again discontinued service, and this has led to the inauguration of a jitney line in the city. In February, 1916, service was resumed on the line after having been suspended for more than a year.

Bonus for Pacific Electric Railway Employees.—J. McMillan, general manager of the Pacific Electric Railway, Los Angeles, Cal., announced on Jan. 2 that the company would give all employees who had been in service two years and were receiving less than $2,000 a year a bonus of 10 per cent of their salaries. Half the amount will be paid in January and the remainder in July.

Newspaper Reviews Railway Work.—The *Daily Journal* of Springfield, Ill., published a column article recently giving detailed information of the interurban railways centering in that city and praising the work of the Springfield Consolidated Railway. The work of the Illinois Traction System was noted carefully. Several roads which are projected from that city also received attention.

Completing the St. Paul Electrification.—Finishing touches are being put on the last 25-mile stretch of electrified territory of the Chicago, Milwaukee & St. Paul Railroad. It is expected that the entire mountain division will be electrically operated by Feb. 1. Early in December the line from Harlowton to East Portal, 406 miles, was in operation for passenger and freight service.

Another "Conscience" Contribution—"God forgive me" was the footnote of an unsigned letter, accompanied by $50, which the Public Service Railway, Newark, N. J., received recently. Above the footnote was written, "Conscience Money—N. & S. O. Ry." The letter was mailed in Newark. It is supposed to be from a conscience-stricken conductor on the Newark and South Orange line.

Danbury Hatters' Judgment.—In a new phase of the old "Danbury hatters'" case the Supreme Court on Jan. 8 decided that Dietrich E. Loewe, Danbury, Conn., hat manufacturer, and not the United Hatters' Union, is entitled to $20,000 in interest accrued on union hatters' savings bank deposits attached toward satisfying Loewe's $353,000 judgment secured under the Sherman law for union boycotting in 1903.

Railway Men Arraigned for Failure to Heat Cars.—The seven officials of the Brooklyn (N. Y.) Rapid Transit Company who were summoned to court for failing to maintain a minimum temperature of 40 deg. Fahr. in the cars on their lines appeared before Magistrate Walsh in the Adams Street Police Court on Jan. 16. Through their attorney they waived examination and were held in $100 bail each for Special Sessions.

Refuse Officially to Call Off Strike.—Sixty members of Division 709 of the Amalgamated Association on Jan. 10 unanimously voted "to continue" the strike called on July 16 on the lines of the Harrisburg (Pa.) Railways. More than seventy-five members of the union are back at work under the new working agreement made by the company with its men, and the places of the other men were long since filled with new men.

Interurban Road Increases Wages.—The Rockford & Interurban Railway, Rockford, Ill., increased wages 1 and 2 cents an hour, effective on Jan. 1. The wage increase affects 200 men. The younger men will receive the 2-cent increase, as the older men received the larger advance last year. The present wage scale is from 21 to 28 cents an hour. The increase involves an additional expense to the company of about $10,000 a year.

Check of Minneapolis Valuations Suggested.—The economy and efficiency committee of the new City Council of Minneapolis, Minn., on Jan. 4 discussed the suggestion of Mayor Van Lear that an expert be retained to check the valuations submitted by the Twin City Rapid Transit Company and by City Engineer Cappelen in connection with the application of the Minneapolis Street Railway for a renewal of its franchise in Minneapolis.

Pittsburgh Subway Legislation Proposed.—C. K. Robinson, assistant city solicitor of Pittsburgh, Pa., is preparing for introduction into the Legislature of Pennsylvania a general measure providing for rapid transit subway construction in Pittsburgh. It is said that the basic idea of Mr. Robinson's plan is to provide for a city-built downtown subway loop or make legal the provision of funds for the construction of such a line by a private corporation.

Franchises Made Uniform in Expiration.—On Dec. 29 the street railway committee of the City Council of Cincinnati, Ohio, decided to approve an extension of ten years in the franchise of the Interurban Railway & Terminal Company. It provides for certain changes in route to conform to improvements made at the Delta Avenue crossing, but makes no reference to the rates of fare. The franchises of the company will now all expire at the same time.

Municipal Employees Seek Increase.—The trainmen in the employ of the San Francisco (Cal.) Municipal Railway have renewed their request to the Board of Works for an increase in wages of 5 cents an hour. While the last annual statement of the lines showed a profit, T. A. Cashin, superintendent, issued a note of warning against overextension. The cost of the increase now requested is placed at $72,000 for the year, and T. A. Reardon, president of the Board of Works, has intimated that the board will support Mr. Cashin in the stand that he has taken and that no unnecessary outlays will be made.

Adamson Law Argument Concluded.—Argument in the Adamson law case was concluded before the Supreme Court of the United States on Jan. 10 and that body now has before it for decision the question of whether the Adamson statute is constitutional. In their closing arguments the railroad attorneys, Walker D. Hines and John G. Johnson, maintained that there was a lack of authority by Congress to enact "railroad wage legislation." They insisted that the new law was incapable of operation with judicial interpretation. They contended, furthermore, that the act took away property without due process of law and that it interfered with liberty of contract.

Affairs of United Railways, St. Louis, Reviewed.—The St. Louis *Post-Dispatch* in its issue of Jan. 16 published a review of the affairs of the United Railways, including a summary of the history of the company's organization, both financial and legislative, presented in the light of the appeal by the company to the city for release from the so-called mill tax. Richard McCulloch, president and general manager of the company, was quoted as giving among other reasons for the problems that confront the company now the severe general panic of 1907, continuous and unprecedented increases in the prices of labor and materials, the increase in the use of the transfer and the higher standards of service required by the Public Service Commission.

Commissioner Wood to be Tried in February.—Assistant District Attorney James O'Malley of New York City applied on Jan. 4 to Judge Mulqueen, in General Sessions, to have the case of ex-Public Service Commissioner Robert Colgate Wood, under indictment on a charge of having solicited a bribe, put on the regular calendar for an early trial. Judge Mulqueen assigned the trial to the February term of Part VI, where Judge Nott will be sitting. Judge Nott last month denied a motion made by District Attorney Swann to dismiss the indictment against Mr. Wood, on the ground of insufficient evidence. In his decision, Judge Nott said that as Mr. Wood was a public official, he should be tried on the indictment, and either be vindicated or convicted.

Franchise Referendum in Dallas.—The City Commission of Dallas, Tex., on motion of Mayor Lindsley, has passed a resolution submitting the railway and lighting franchises granted by the city of Dallas to J. F. Strickland and C. H. Hobson to a referendum election. This action was taken by the Mayor when it was disclosed that the petitions being circulated asking a referendum election on the franchises were void through being improperly drawn. These franchises have been approved by the City Commission substantially as first drawn. They are to be passed in connection with the plan under which control of the present local railway and light properties will pass from Eastern to Dallas interests under terms reviewed previously in the ELECTRIC RAILWAY JOURNAL.

Man Shortage in Bridgeport.—Charles H. Chapman, local manager of the Connecticut Company in Bridgeport, Conn., was quoted in the Bridgeport *Standard* of Jan. 8 as follows: "All big organizations have found it extremely difficult to secure the kind of men they want to work for them. Especially has this been true within the last year or so, when the demand for workers has far exceeded that of any other year. Just as an instance of this, the Connecticut Company for the year just ended hired 1111 men. Of these, there are exactly 218 now in our employ. We can't always secure the kind of men that we want. In fact, I may go so far as to state that at times dismissals reached as high as four a day. We were compelled temporarily to retain men we otherwise would have discharged through fear that we wouldn't have enough on hand to man the cars the next morning."

Toledo Paper Gets an Appeal.—On Jan. 10 Judge Denison of the United States Circuit Court allowed the Toledo Publishing Company, publisher of the Toledo *News-Bee*, an appeal from the decision of the United States Court of Appeals to the United States Supreme Court. The Circuit Court recently affirmed the sentence of the United States District Court at Toledo in which a fine was assessed upon the paper and N. D. Cochran, its editor, in contempt proceedings which grew out of articles, editorials and cartoons published in the paper, following the action of the District Court in a street railway decison. The case was appealed on error, and in its assignment of errors the publishing company claims the Circuit Court of Appeals erred in affirming the judgment of the District Court; that it should not have held the lower court had jurisdiction, and that it should have reversed the judgment on the ground that there was no evidence that the publications complained of had been read by United States District Judge J. M. Killits of the District Court at Toledo. The case grew out of the negotiations between the city and the Toledo Railways & Light Company for a renewal of the franchise of the company.

Railway Business Association Meets.—The annual dinner of the Railway Business Association was held at the Waldorf, New York, N. Y., on the evening of Jan. 16. George A. Post, president of the association, said that he hoped the Newlands joint Congressional committee, recently constituted to canvass the whole railway situation, would approach its task with breadth of mind and a desire to solve the problem for the benefit of the public. Alfred P. Thom, general counsel of the Railway Executives' Advisory Committee, expressed his belief "that every member of the joint committee on interstate commerce is convinced of the need for a real remedy." Frederic A. Delano, a member of the Federal Reserve Board, recited some fallacies which he thought were at the bottom of the public misunderstanding concerning the railway problem. At the annual meeting of the association the members re-elected as president Mr. Post, and as vice-presidents W. H. Cottingham, Cleveland; W. B. Leach, Boston; E. B. Leigh, Chicago; Henry Elliot, East St. Louis; J. S. Coffin, New York; Irving T. Hartz, Chicago, and J. C. Bradley, Buffalo. M. S. Clayton, of New York, was re-elected treasurer. In his annual address before the business meeting Mr. Post made a plea for support of the Chamber of Commerce of the United States.

Financial and Corporate

Annual Report

Bay State Street Railway

The comparative income statement of the Bay State Street Railway, Boston, Mass., for the years ended June 30, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Operating revenue	$9,996,484	100.0	$9,538,406	100.0
Operating expenses	7,764,880	77.7	6,897,752	72.3
Net operating revenue	$2,231,604	22.3	$2,640,654	27.7
Taxes	609,062	6.0	653,380	6.9
Operating income	$1,622,542	16.3	$1,987,274	20.8
Non-operating income	62,811	0.6	66,459	0.7
Gross income	$1,685,353	16.9	$2,053,733	21.5
Deductions from gross income:				
Rent of leased roads	$189,253	1.9	$182,228	1.9
Interest on funded debt	1,037,109	10.4	1,039,077	10.8
Interest on unfunded debt	86,769	0.8	104,279	1.1
Miscellaneous	27,249	0.3	25,599	0.3
Total deductions	$1,340,380	13.4	$1,351,183	14.1
Net income	$344,973	3.5	$702,550	7.4
Dividends:				
First preferred stock	$164,916	1.7	$164,916	1.7
Common stock	102,586	1.0	512,930	5.4
Total dividends	$267,502	2.7	$677,846	7.1
Surplus for year	$77,471	0.8	$24,704	0.3

The foregoing statement is based on that appearing in the latest report of the Massachusetts Electric Companies, the controlling organization. The business of the Bay State Street Railway was favorably affected during the last fiscal year by the great manufacturing activity in parts of the territory served by its lines. As a result, its operating revenue increased $458,077 or 4.8 per cent. The operating expenses, however, increased in greater proportion, by $867,128 or 12.5 per cent, resulting in a diminution of $409,051 or 15.4 per cent in net operating revenue. The operating expenses included $120,000 for depreciation of equipment, the same charge as in 1915, and $379,759 for reconstruction non-betterment, an increase of $196,909. Prior to 1915 no charge was made for depreciation of equipment, and reconstruction non-betterment was charged off to profit and loss.

Taxes and income deductions showed slight decreases for the last year, so that the falling off in net income totaled $357,576, or more than half. The divisible remainder was not sufficient to enable the declaration of dividends in such an amount as would permit any dividend on the preferred shares of the Massachusetts Electric Companies. After paying the interest on its coupon notes, the controlling organization had, on Sept. 30, 1916, a deficit of $4,737, a decrease of $404,215 from the net income before dividends of the year previous. Since the end of the fiscal year, however, and up to Dec. 6, the date of the annual report, the gross and net income of the Bay State Street Railway has shown increases. This result has been obtained in spite of the jitney competition, which still exists, although without any increase above the estimated figures of a year ago.

During the year the following amounts were spent on new property and reconstruction: Track construction, $57,978; track reconstruction and State and municipal requirements, $374,929; cars and electrical equipment, $84,070; electric lines and feeders, $154,599; power stations, $43,426; land and buildings, $15,189; and sundry equipment, $4,264; total, $734,457.

Most of the latest annual report is devoted to a detailed consideration of various points in connection with the decision of the Massachusetts Public Service Commission in the Bay State Street Railway fare case. After taking issue with the commission in various matters, the report concludes:

"The trustees believe that the result will prove the company to have been fairly entitled to all the increases in fares which it originally requested, but it will take time to show who is right about that. We think the greater part of the criticisms contained in the opinion of the commission are unfounded, and that the ignoring of all the necessary elements of credit is a dangerous error, but no reasonable person can quarrel with the caution which desires to see doubtful matters rendered certain by actual trial before taking further action. The position adopted by the commission that the Bay State Street Railway may apply again for leave to increase fares if the changes they have permitted do not produce a proper net income, apparently indicates that the necessary relief has merely been postponed to ascertain the result of the changes allowed. The concessions granted by the commission may prove sufficient; if so, the desired result has been obtained; if not, it will be necessary to show the commission that they are insufficient.

"In the course of their opinion the commissioners stated that the present situation of the Bay State Street Railway is not one which need cause discouragement. For somewhat different reasons than those set forth in the opinion, the trustees agree with that conclusion. If the non-paying lines are made to pay, the property ought to do well enough. There can be no question that the earning possibilities of the company are better since the commission's decision than they were before. The officers of the company are making an honest and strenuous effort to do all the things advised by the commission for which the necessary means can be found, and to procure therefrom every possible dollar of increased revenue. We see no reason why the Bay State Street Railway should not resume its former condition of prosperity if it receives fair treatment from the public and the regulating authority, and we believe that it will in the end receive that treatment."

New York Lines in 1916

Railway Operating Revenues Increased 5 Per Cent During Last Fiscal Year—Net Income Gained 72 Per Cent

According to the latest annual report of the Public Service Commission for the Second District of New York, the falling off of railway operating revenues during the fiscal year ended June 30, 1915, for the electric railways under its jurisdiction did not persist during the last fiscal year. On the contrary, the railway operating revenues for the year ended June 30, 1916, represented at $32,668,000 (in round numbers) an increase of 5 per cent over those of the preceding fiscal year, while the net income showed a gain of 72.2 per cent. This was in decided contrast to the showing made in the previous year, when the railway operating revenues for the first time since the formation of the commission in 1907 showed a decrease, which in comparison with 1914 was 2.9 per cent, with the net income dropping 46.3 per cent.

To give the showing more in detail, it may be said that the railway operating expenses totaled $21,318,000, an increase of 5.4 per cent for the year, so that the net revenue from railway operation at $11,350,000 showed an increase of 4.1 per cent. The operating ratio rose from 64.99 to 65.26. Railway tax accruals increased very slightly by 0.1 per cent to a total of $1,993,000, and the railway operating income therefore rose 5 per cent to $9,357,000. The railway operating income was nearly as high as that in the highest preceding year of the series, 1914. The net revenue from other operations increased 5.5 per cent, but the non-operating income fell off 4.5 per cent, so that the gross income at $10,725,000 showed a gain of 4.5 per cent. Interest charges, which amounted to $7,636,000, showed a substantial decrease of 4.4 per cent, this being partly offset by an increase of 10.6 per cent in the $1,433,000 of other deductions, including rentals, amortization of suspense items, etc.

The net income at $1,607,000, while showing a gain of 72.2 per cent for the last fiscal year, represented a decrease of 44.0 per cent from that secured in 1907. In the ten years for which the commission has electric railway reports, in only three instances, 1910, 1911 and 1912, has the net income been greater than that in 1907. The decrease in 1916 was next to the largest during the period, the preceding decreases in 1913, 1914 and 1915 being respectively 28.4 per cent, 39.5 per cent and 67.5 per cent.

In the last fiscal year, the dividends at $2,985,000 represented an increase of 7.2 per cent, their excess over the net income figure showing that to some extent they were paid out of accumulated surplus. The total fares and transfers amounted to 643,472,000, a gain of 5.8 per cent, and the total revenue car miles to 104,396,000, an increase of 1.0 per cent. The traffic total was greater than in any preceding year, and the number of revenue car miles was greater than for any year except 1914.

The miles of road operated within New York State during the last fiscal year were 2027. It should be remembered, however, that this mileage figure is not comparable with the income and traffic statistics. While for the electric railways under the commission's supervision the traffic on lines outside the State is very much less important than in the case of steam railroads, it is still considerable. A decrease of 10 miles from the 1915 mileage figures was caused by the abandonment of the road of the Lima-Honeoye Light & Railroad Company and the St. Lawrence International Electric Railroad & Land Company.

In connection with a point emphasized in last year's report of the division of capitalization, *i.e.*, the desirability of utilities analyzing their plant account in order to learn their investment in the different classes of property and also in different localities, it is now reported that work of this character is being actively carried on by corporations owning and operating 1090 miles of track, one-third of the electric railway track mileage in the State. The fixed capital being analyzed, verified and distributed by these corporations amounted on June 30, 1916, to about $82,000,000. In previous years electric railways operating 613.33 miles of track, which represented a reported fixed capital of approximately $51,000,000, completed such work and have since continued to maintain a correct record of their investment in various classes of facilities and in the communities served. According to the commission, the verified returns of corporations which have completed such an allocation of plant costs, show a general and steady increase in the selling prices of their securities. The improvement in the market for practically all classes of securities is partly responsible for this, but it is believed by the commission that its inquiries into the balance sheet accounts, which have resulted in a verification of assets and liabilities, have had a beneficial effect upon the salability of the securities of the utilities concerned.

Boston Report Decided Upon

Legislative Committee Decided Not to Grant Boston Elevated Plea for 6-Cent Fare

The special commission created by the Massachusetts Legislature of 1916 to investigate the financial condition of the Boston Elevated Railway decided on Jan. 11 in executive session not to approve the proposed increase of fare from 5 to 6 cents when it reports to the Legislature. Lieutenant-Governor Coolidge, chairman of the commission, is reported to have said:

"The Elevated has been very anxious to have the 6-cent fare authorized. Our great problem has been to get the Elevated out of its troubles without such an increase."

He further stated that the commission has determined to recommend taking the Cambridge subway off the company's hands, together with the remission of certain franchise and compensation taxes amounting in the aggregate to about $600,000.

The commission will recommend to the Legislature that the Public Service Commission undertake a thorough investigation and examination of the financial condition of the company as well as a comprehensive study for the development and improvement of the transportation service and facilities within the metropolitan district. To Prof. George F. Swain was delegated the work of drafting the report for the committee to submit to the Legislature.

Atlanta Petitions Opposed

Leader of Recent Agitation Against Georgia Railway & Power Company Seeks to Upset Company's Financial Program

At the insistence of the committee raised at a mass meeting of sympathizers with the agitation to compel the Georgia Railway & Power Company to permit the organization of its conductors and motormen by the Amalgamated Association, the Georgia Railroad Commission on Jan. 11 postponed to Jan. 16 its scheduled hearing of the two petitions filed by the power company and of the one petition filed by the Georgia Railway & Electric Company.

One of the power company's petitions is for authority to issue non-interest bearing scrip in the sum of $420,000 for payment at the rate of $30,000 semi-annually of that amount accrued during the past four years, less $60,000 to be paid in cash, on its $2,000,000 issue of 6 per cent first preferred cumulative stock. The other petition by the power company seeks authority to issue $459,000 of first and refunding mortgage bonds. The electric company's petition is for authority to issue $283,000 of refunding and improvement bonds.

Marion Jackson, editor of *The Way*, a weekly Atlanta publication, and one of the leaders in the agitation against the power company, insisted upon the postponement. He declared that he and his associates intended to protest each of the issues, and that their attorney, Thomas B. Felder, was unavoidably absent from the city. He asked for postponement to Jan. 23. He submitted a lengthy document attacking the power company and its affiliated companies on the grounds of low wages, unsatisfactory working conditions, exorbitant charges, undue earnings and several similar grounds. The reading of the petition was interrupted and stopped by C. M. Candler, chairman of the commission, who stated that it was totally irrelevant to the issue of the hearing. Mr. Jackson stated that this document was based upon a report by F. W. Ballard & Company, Cleveland, Ohio, following an investigation by that company of the power company's affairs at the instance of himself and his associates. Among other things, the report suggested that the city of Atlanta construct and operate a municipal electric plant.

Readers of the ELECTRIC RAILWAY JOURNAL will recall that in the course of the trial of William Pollard, strike agitator, in the criminal court of Atlanta upon the charge of inciting to riot, sworn evidence was adduced that the offer had been made to the power company to call off the Ballard investigation if the power company would recognize the Amalgamated Association. This offer was characterized by President P. S. Arkwright, on the witness stand, as an attempt to blackmail the company.

Securities of Nova Scotia Company Offered

A syndicate of bankers in which Lee, Higginson & Company; Potter, Choate & Prentice and Stone & Webster are participants, are making two offerings of the securities of the Nova Scotia Tramways & Power Company, Ltd., Halifax, N. S. The offerings consist of (1) Nova Scotia Tramways & Power Company, Ltd., first mortgage 5 per cent gold bonds due Dec. 1, 1946, at 95½ and interest to yield about 5.30 per cent, and (2) Nova Scotia Tramways & Power Company, Ltd., preferred and common stock in blocks of ten shares of 6 per cent cumulative preferred stock and three shares of common stock each of a par value of $100 for $1,000.

The Nova Scotia Tramways & Power Company, Ltd., was incorporated under a special act of the Legislature of Nova Scotia in 1914 and is the successor to the Halifax Electric Tramway, Ltd. It does the entire electric light, power and gas business and also the entire electric railway business in Halifax and serves a population of about 65,000. In addition, it is empowered to acquire water powers, land, etc., on the Gaspereaux River, 55 miles from Halifax, capable of a hyroelectric development of approximately 12,608 hp. The company has authorized $10,000,000 of first-mortgage 5 per cent gold bonds due in 1946, $2,500,000 of 6 per cent cumulative preferred stock and $3,500,000 of common stock. Of these amounts $2,250,000 of bonds, together with $1,500,000 of preferred stock and $2,500,000 of common stock, have been issued. It is explained that the purpose of the present issues of stocks and bonds of the company is to provide for the acquisition of the properties of the Halifax Electric Tramway, Ltd., and the water power rights on the Gaspereaux River and to provide adequate working capital.

Hearing on Frontier Railway

Pennsylvania and D., L. & W. Railroads Seek to Purchase Stock of Frontier Electric Railway

The Pennsylvania Railroad and the Delaware, Lackawanna & Western Railroad presented an application before the Public Service Commission for the Second District of New York at Albany on Jan. 15 for permission to purchase the capital stock and the right-of-way of the Frontier Electric Railway between Buffalo and Niagara Falls, paralleling and contiguous to the high-speed line which the International Railway now has under construction. The applicants, however, did not disclose enough of their plans and proposed developments of the road to satisfy the commission and the case was adjourned subject to call.

All of the railroad interests at Buffalo and the Niagara frontier were represented at the hearing. Assurance was given that the road would be run only as an electric line, but the proponents of the scheme did not deny that it might be used for freight as well as for passenger business.

The stock of the Frontier Electric Railway, it developed, is owned by Marshall J. Dodge of the New York banking firm of Bertron, Griscom & Company. He also holds title to the right-of-way. He owned the right-of-way of the old Buffalo, Thousand Islands & Portland line and has already sold to the International Railway space for its double track line. E. G. Connette, president of the International Railway, was present at the hearing and registered no opposition to the plans.

L. L. Babcock, representing the Delaware, Lackawanna & Western Railroad, told the commission that it was important that the plans for the development of the Frontier Electric Railway be hurried along as its powers lapse within the next few years. The company was organized in 1906, under the authority of the old railroad commission.

Brooklyn (N. Y.) City Railroad.—Frank Lyman, president of the Brooklyn City Railroad, which is operated under lease by the Brooklyn Rapid Transit Company, on Jan. 15 addressed the following communication to the stockholders of the Brooklyn City Railroad: "You have been previously advised that your directors expected to resume the payment of the full dividend of 10 per cent per annum on Oct. 15, 1917. Since the completion of the payment of the current obligations of the company on account of the settlement of the suit on Oct. 23, 1913, the books show we now have $168,000 in current cash and invested in real estate mortgages and securities. Your directors feel there should be a substantial increase in said amount of $168,000 by adding thereto $60,000 on April 1, 1917, from the quarterly rent of $300,000 to be received on said date from the lessee, so as to bring the amount up to and over $228,000 before resuming the payment of said 10 per cent dividends. Therefore, your directors now expect to resume the payment of the full dividend of 10 per cent per annum on July 15, 1917, instead of Oct. 15, 1917, as previously announced. The directors on Jan. 2, 1917, declared a quarterly dividend of 2 per cent upon the capital stock of the company, amounting to $240,000, payable on Jan. 15 to stock of record on Jan. 3."

Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio.—The Cleveland Trust Company, trustee of the first mortgage 5 per cent bonds of the Cleveland, Painesville & Ashtabula Railroad, has notified holders of the bonds that no funds were deposited to pay the coupons maturing on Jan. 1. There are $1,000,000 of the bonds outstanding, and a protective committee has been organized in the interest of the holders. In 1906 the Cleveland, Painesville & Eastern Railroad acquired control of the Cleveland, Painesville & Ashtabula Railroad. The bonds on which the interest remains unpaid are dated July 1, 1902, and are due July 1, 1922. They are not guaranteed, and the section of the road which they cover is understood to have failed for some time fully to cover its charges. E. V. Hale and J. A. House, bankers of Cleveland, have been named as the protective committee, and bonds are to be deposited with the Cleveland Trust Company.

Columbus, Delaware & Marion Railway, Cincinnati, Ohio.—The Cleveland Trust Company, Cleveland, Ohio, as trustee of the first mortgage bonds of the Columbus, Delaware & Marion Railway, has filed an answer and cross petition in the receivership proceedings of that company asking foreclosure of the first mortgage. The trustee avers that the company defaulted in the payment of interest of $25,000, due on Nov. 1, 1916, on $1,000,000 of first mortgage bonds. The receiver of the company had paid practically all interest charges up to last November, but the demand for improvements in 1916 caused the expenditure of all surplus earnings, and no money was available to pay the interest maturing in November.

Commonwealth Power Company of Nebraska, Lincoln, Neb.—Liggett, Hichborn & Company, New York, N. Y., are offering for subscription at 100 and interest $750,000 of first mortgage 6 per cent gold bonds of the Commonwealth Power Company dated March 1, 1914, and due March 1, 1944, callable at any time at 105. The bankers say: "The Lincoln Traction Company of Lincoln, Neb., by agreement, reference to which is indorsed upon each bond, obligates itself to pay from the amounts due the power company, the interest charges and the sinking fund of the Commonwealth Power Company of Nebraska. By this agreement the interest charges of the Commonwealth Power Company become a part of the operating expenses of the Lincoln Traction Company, and are a prior charge to all interest charges on its bonds."

General Gas & Electric Company, New York, N. Y.—The holding of the General Gas & Electric Company in the securities of its subsidiaries on Jan. 13, 1917, was as follows: 14.8 per cent of the total bonds outstanding, 70.6 per cent of the total preferred stocks outstanding, and 95.2 per cent of the total common stocks outstanding.

Hagerstown & Frederick Railway, Frederick, Md.—Nelson, Cook & Company, Baltimore, Md., are offering for subscription at 100 and interest to yield 6 per cent first and refunding 6 per cent thirty-year sinking fund gold bonds of the Hagestown & Frederick Railway dated April 1, 1914. The authorized issue is $10,000,000 and there are outstanding at present $1,224,000. The bonds are in coupon form in the denomination of $1,000, $500 and $100. They are redeemable at 105 per cent of par with interest, at any interest period. The letter from Emory L. Coblentz, president of the railway, to the Fidelity Trust Company, Baltimore, trustee of the issue, explains that the bonds are secured by a first mortgage on practically the entire street railway system in Frederick, on almost the entire line from Frederick to Thurmont, on the company's new modern power plant, and high-tension transmission lines and substations throughout the system; and upon the entire street railway trackage in Hagerstown, as well as the branch line from Hagerstown to Williamsport, and the line from Hagerstown running eastward to Funkstown. The bonds are in addition a direct mortgage on the remaining properties of the company subject to $850,000 prior lien bonds. By a covenant in the deed of trust securing the first and refunding bonds, the mortgages securing prior lien bonds of constituent companies have been closed.

Ohio Valley Electric Railway, Huntington, W. Va.—The Fidelity Trust Company, Baltimore, Md., heads a syndicate which has bought an issue of $800,000 of Ohio Valley Electric Railway first mortgage 5 per cent bonds. With this issue the outstanding bonds of the railway amount to $1,679,000. The bonds are a direct first mortgage upon all railway property now owned or hereafter acquired.

Philadelphia (Pa.) Rapid Transit Company.—A semi-annual dividend of 2½ per cent, or $1.25 per share, has been declared out of the surplus earnings of the current fiscal year beginning July 1, 1916, upon the capital stock of the Philadelphia Rapid Transit Company, payable on Jan. 31, 1917, to shareholders of record at the close of business on Jan. 22, 1917. Last October $1 was paid on the stock, being the first disbursement since the company was formed in 1902.

West End Street Railway, Boston, Mass.—The Massachusetts Public Service Commission has authorized the issue by the West End Street Railway of thirty-year bonds to the amount of $2,700,000 bearing interest at not more than 6 per cent for the retirement of a like amount of bonds due on Feb. 1, 1917. The West End Street Railway is operated under lease by the Boston Elevated Railway.

Dividends Declared

Columbus Railway, Power & Light Company, Columbus, Ohio, quarterly, 1¼ per cent, preferred B; quarterly, 1¼ per cent, common.

East St. Louis & Suburban Company, East St. Louis, Ill., quarterly, three-quarters of 1 per cent, preferred.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., quarterly, 1½ per cent, preferred.

Electric Railway Monthly Earnings

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.					
1m., Nov., '16	$168,131	*$120,526	$47,605	$35,741	$11,864
1 " " '15	156,441	*106,097	50,344	35,616	18,728
5 " " '16	932,957	*616,072	316,885	179,546	137,339
5 " " '15	869,759	*568,757	301,002	182,741	118,261
CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.					
1m., Nov., '16	$103,536	*$73,866	$29,670	$29,735	†$65
1 " " '15	98,812	*61,537	37,275	29,623	7,652
12 " " '16	1,230,205	*798,411	431,794	355,949	75,845
12 " " '15	1,071,013	*730,036	340,977	357,315	†16,338
CONNECTICUT COMPANY, NEW HAVEN, CONN.					
1m., Nov., '16	$759,716	*$636,392	$123,324	$96,488	‡$49,557
1 " " '15	679,900	*487,961	191,939	100,575	‡114,719
5 " " '16	4,262,684	*3,214,988	1,047,696	487,891	‡703,142
5 " " '15	3,747,870	*2,496,831	1,251,039	493,014	‡874,177
EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.					
1m., Nov., '16	$278,467	*$168,019	$110,448	$63,410	$47,038
1 " " '15	219,595	*127,551	92,044	62,679	29,365
12 " " '16	2,970,054	*1,777,194	1,192,860	754,265	438,595
12 " " '15	2,442,300	*1,441,179	1,001,121	765,081	236,040
GRAND RAPIDS (MICH.) RAILWAY					
1m., Nov., '16	$102,921	*$67,706	$35,215	$17,322	$17,893
1 " " '15	99,020	*66,024	32,996	14,223	18,773
12 " " '16	1,290,412	*840,470	449,942	181,654	268,288
12 " " '15	1,190,353	*823,215	367,138	164,874	202,264
LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO					
1m., Nov., '16	$125,610	*$86,790	$38,820	$36,263	$2,557
1 " " '15	112,682	*74,626	38,056	35,992	2,064
11 " " '16	1,468,736	*924,797	543,939	400,089	143,850
11 " " '15	1,263,331	*821,245	442,086	397,107	44,979
LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.					
1m., Nov., '16	$207,397	*$139,243	$68,154	$52,353	‡$35,795
1 " " '15	190,556	*114,943	75,613	53,363	‡34,408
12 " " '16	2,471,871	*1,518,110	953,761	630,493	‡468,476
12 " " '15	2,056,875	*1,204,387	852,488	665,246	‡323,387
NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.					
1m., Nov., '16	$199,981	*$120,520	$79,461	$42,314	$37,147
1 " " '15	185,260	*11,567	67,693	42,902	24,791
12 " " '16	2,370,491	*1,445,906	924,585	509,791	414,794
12 " " '15	2,136,817	*1,313,008	823,809	498,720	325,089
NEW YORK (N. Y.) RAILWAYS					
1m., Nov., '16	$837,383	$614,547	$222,836	$361,681	†‡$76,272
1 " " '15	1,134,595	672,139	462,456	370,532	‡140,729
5 " " '16	4,447,489	2,972,433	1,475,056	1,824,760	†‡80,416
5 " " '15	5,795,652	3,420,963	2,374,689	1,853,975	‡748,004
NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.					
1m., Nov., '16	$22,650	*$22,367	$283	$7,987	†‡$7,659
1 " " '15	25,092	*24,301	791	7,998	†‡7,157
5 " " '16	164,268	*127,606	36,662	39,935	†‡3,004
5 " " '15	186,660	*135,332	51,328	40,003	‡11,638
NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.					
1m., Nov., '16	$52,414	*$47,276	$5,138	§$5,972	†‡$266
1 " " '15	44,264	*41,804	2,460	§5,421	†‡1,628
5 " " '16	259,309	*231,588	27,721	§31,767	‡747
5 " " '15	214,340	*208,158	6,182	§30,460	†‡16,040
PHILADELPHIA (PA.) RAPID TRANSIT COMPANY					
1m., Dec., '16	$2,487,287	$1,396,094	$1,091,193	$813,921	$277,272
1 " " '15	2,213,472	1,237,668	975,804	815,497	160,307
6 " " '16	13,857,145	7,703,819	6,153,326	4,887,234	1,266,092
6 " " '15	12,416,972	6,959,936	5,457,036	4,895,793	561,243

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*Includes taxes. †Deficit. ‡Includes non-operating income. §Excludes interest on bonds, charged income and paid by the New York, New Haven & Hartford Railroad, under the guarantee; also interest on notes held by the New York, New Haven & Hartford Railroad not credited to income of that company.

Traffic and Transportation

B. R. T. Efficiency Campaign

Surface Transportation and Mechanical Departments Start Series of Weekly Efficiency Bulletins as Educational Mediums

Plans in connection with the recently inaugurated joint efficiency campaign of the men and management of the Brooklyn Rapid Transit system, an announcement of which appeared in the ELECTRIC RAILWAY JOURNAL of Jan. 13, have matured rapidly enough to allow departmental educational work under the efficiency program to be instituted in the surface transportation and mechanical departments.

According to the *B. R. T. Monthly*, departmental notices announced the establishment in the surface transportation and mechanical departments respectively of a series of weekly efficiency bulletins, each of which the participants in the campaign would be expected to read one every day until the next bulletin appeared. The notices also invited suggestions and particularly solicited the co-operation of safety committees. Enrollment blanks were distributed in the various surface depots during the week of Dec. 4 to 9 and about 4800 out of a total of 5200 surface transportation department employees voluntarily signed them and turned them in as evidence of their desire to participate in the joint efficiency campaign.

In both the surface transportation department and the mechanical department the efficiency bulletin service was started with a bulletin entitled "Your Heart in Your Work and Your Mind on the Job." In the mechanical department this bulletin was followed by a bulletin on "Rules," dealing with the necessity of self-discipline, pointing out the uselessness to himself and everybody else of the man who refuses to impose upon himself any rules and the fact that such a man generally comes into conflict with the "Rules" or laws of the community and by suffering prosecution and punishment is made to feel their existence more forcibly than anyone else.

Investigation of Blue Hill Fares

Seven-Cent Fare Unit with Old Three-Zone System Discussed as Possible Solution for Any Equitable Adjustment

Financial results of the existing fare units and zone system on the Blue Hill Street Railway were discussed before the Massachusetts Public Service Commission at Boston on Jan. 3, upon petition of the selectment of Canton asking for the restoration of the former three main-line zones with three 6-cent fares. A. Stuart Pratt, vice-president of the Stone & Webster Management Association and of the railway, represented the company.

Mr. Pratt said that speaking broadly, the results of the last year and a half under the four-zone main-line system have not proved financially satisfactory for the company. The total gain on the entire Blue Hill road, resulting from the fare and zone changes ordered, was $1,862 in the year ending Oct. 31, 1916. The total revenue passengers carried, including those riding on all classes of revenue tickets, increased from 1,471,393 to 1,731,522 during the year, in comparison with those riding in the previous year, when four fare zones were in effect on the entire system, five zones being in operation under the commission's order, taking main and branch lines into account, since July, 1915.

On behalf of the company it was contended that this increase is inadequate, especially in view of the recent large increase in expenses which has unavoidably resulted from rising cost of labor and materials. Mr. Pratt said that while it has been impossible to analyze the earnings of the system sufficiently to determine the principal cause of the addition to revenue, the increased prosperity of the communities served has unquestionably been a substantial factor. At this time the company is not prepared to recommend any further fare increase, but J. A. Murphy of the Canton board of selectmen suggested that a compromise solution worked out in the board favors the establishment of a 7-cent fare unit under the old three-zone system, with workingmen's tickets at the rate of ten for 60 cents. Mr. Pratt stated that while he desired not to give a final opinion as to the merits of the proposal for a 7-cent fare unit at the time of the hearing, he was inclined to favor its trial, but for a shorter period than one year. There is no way of ascertaining, Mr. Pratt said, what the maximum practicable fare unit is on such a road, without the test of experience. The use of one-man cars is being considered, but no conclusion has as yet been reached. Mr. Pratt said that he anticipated a double-truck design for one one-man car service would be developed in the street-railway field in due course.

Courtesy a Medium for Safety Training

Application of This Principle Is Being Urged by the New York & Queens County Railway as a Direct Method for Preventing Accidents

Courtesy is the keynote of a series of educational classes for employees recently started by the New York & Queens County Railway, Long Island City, N. Y., and held in its Woodside carhouse. According to a statement made by Martin F. Lynch, assistant attorney of the company, to a representative of the ELECTRIC RAILWAY JOURNAL, the inauguration of this movement, although partly inspired by similar educational talks held in the depots of the New York Railways under the direction of James L. Quackenbush, general attorney of that company, became imperative in order to reduce the unusual number of accidents suffered by the company last fall, owing to certain local conditions. When this company was involved in a labor strike during last September, October and part of November, it became necessary to employ an unduly large number of new platform men, thus handicapping the work of administering proper instruction.

The handling of cars by untrained crews, together with the overcrowding caused by an inordinate growth of suburban travel in premature anticipation of the yet uncompleted rapid transit facilities in Queens County, contributed to an alarming number of accidents. Mr. Lynch stated that the legal department of his company met with accident cases wherein it was impossible to obtain a favorable verdict from the jury, because, as some of the jurymen afterwards admitted, they had based their judgment on previous ill-treatment which they themselves had suffered at the hands of discourteous motormen and conductors.

The new educational lectures are divided into two classes: accident prevention, given by Mr. Lynch, and proper car operation, covered by S. H. Serena, superintendent of transportation. The talks, now given three times a day when feasible, will be continued until all the employees on the system have been included, and will probably be supplemented later by moving pictures. During the February meetings it is expected to have J. W. Gerke, superintendent of maintenance, discuss the handling of car equipment from the safety standpoint. The meetings are held in a most informal manner and the men have been encouraged to participate freely in the discussions, ask questions and report any complaints they may have heard from passengers. Mr. Lynch has devoted particular attention toward encouraging polite insistence by conductors that their passengers be not permitted to stand on the platforms, a frequent source of accidents, but pass into the interior of the car. There are many patrons on this line, who, although they have been accustomed to obey the rule against platform riding on the pay-as-you-enter cars in Manhattan with which they are familiar, have shown obstinacy in this matter when riding on the non-prepayment cars of the New York & Queens County Railway.

The new lectures are claimed to have had highly successful results, the rate of accidents during the last three weeks having decreased about 50 per cent, with a marked reduction also in the number of collisions.

Autoists Warned of Danger

Secretary of State of New York Sounds Note of Warning in Letter Accompanying 1917 Registrations

In an effort to bring about a decrease in the number of grade crossing accidents 400,000 folders impressing the need of a more strict observance of "Stop, Look and Listen" are being mailed New York State automobilists by Secretary of State Hugo. In this the State automobile bureau is co-operating with one of the main trunk lines, the latter bearing the expense. A folder is now being sent with each 1917 certificate of registration.

The folder calls attention to the fact that more than 1000 persons are killed in grade crossing accidents each year in the United States and that a tenth of the number are from New York State alone. Twice the number are seriously injured. There has been a 100 per cent increase in grade crossing accidents in the last five years.

Secretary Hugo urges motorists to use care when approaching a grade crossing. The folder also carries the suggestion that motorists take no chances, but always stop or slow down and then both look and listen. So far as is known the present effort is the first of its kind between railroad and State automobile bureaus.

As has been noted previously in the ELECTRIC RAILWAY JOURNAL, the electric railways of New York are also busy at work in co-operating with automobile clubs and Secretary Hugo's office in the hopes of bringing about like results. Sunday casualties at grade crossings have become altogether too numerous. A meeting along safety-first lines will be held in the near future. Among the recommendations to be made at that time will be the following:

That warning whistles on trolley cars be of a type not producing sound which can be confused with those of an automobile horn.

That automobile horns be standardized as to volume of tone.

That steps be taken to secure legislation requiring vehicles, including horse drawn as well as automobiles, to carry lights by night that will be visible from front, rear and both sides.

That obstructions on highways outside of cities and villages precluding a proper length of vision at crossing be removed at public expense.

That obstructions on railroad companies' private rights-of-way precluding a proper length of vision at crossings be removed by the railroads at their own expense.

That obstructions on private property outside of cities and incorporated villages precluding a proper length of vision at crossings be removed by the town, county or State, legislation being enacted to that end. If such obstructions are not removed that the Public Service Commission have power upon its own initiative to order such.

That all public highway crossings of electric railways outside of cities and incorporated villages including those protected by gates or flagmen be equipped with stationary crossing signs illuminated after dark.

That stationary district signals be installed on the highways bearing the words: "Railroad Crossing, 500 ft.," the State, county or town bearing the expense.

That warning whistles on electric road begin not less than 800 ft. from a crossing and continue until the crossing is reached.

War Fund for British Columbia Employees

When the European war broke out in August, 1914, and the necessity of the Canadian Patriotic Fund was foreseen, and subscriptions were being solicited throughout the Dominion of Canada, the British Columbia Electric Railway, Ltd., Vancouver, B. C., through George Kidd, general manager, volunteered until further notice to take care of the dependents of its employees who enlisted for war service. Monthly payments to dependents were made direct by the company until the end of October, 1916, when owing to many married men who enlisted during 1916, the monthly payment aggregated a sum in excess of what the company considered it could afford to contribute. Therefore, a new arrangement was made, whereby the company, instead of making the payments direct to dependents of employees, agreed to make a monthly contribution of $2,000 direct to the Canadian Patriotic Fund, and the managing committee of the Vancouver Branch of the fund, took over the payments to the families of employees on the basis of the regulations governing the distribution of the fund.

With regard to the company's employees and their contributions to the fund the employees formed a committee at the beginning of the war and solicited subscriptions to the Canadian Patriotic Fund. Many of the employees agreed to contribute 1 per cent of their wages each month, the contribution to be deducted from the payrolls and paid over to the honorary treasurer of the fund. This amounted to approximately $480 a month. The straight 1 per cent has been adhered to until recently when Sir Herbert Ames, the honorary secretary of the Canadian Patriotic Fund, visited British Columbia for the purpose of arranging additional voluntary subscriptions, and immediately following his visit a general canvass of the cities and districts was undertaken and a large percentage of the company's employees has already increased the monthly subscriptions, and it is expected that when the canvass is completed the total monthly contribution by the employees of the railway and its subsidiary companies will be $800 or more.

Serious Head-on Collision in Western New York.—In a head-on collision on Jan. 2 on the Jamestown, Westfield & Northwestern Railroad, Jamestown, N. Y., the motormen of the cars were killed, three passengers were seriously injured and about a score of other passengers were injured slightly.

Cleveland Council Considers Street Railway Matters.—Two resolutions were introduced in the Cleveland City Council on Jan. 15, one asking the Cleveland Rapid Transit Railway Company to show cause why its franchise should not be revoked, and the other for the immediate revocation of its franchise. Both were referred to the committee on streets.

Mayor Vetoes Measure for Seats for Motormen.—Mayor George Karb of Columbus, Ohio, on Jan. 12 vetoed the Alcott ordinance which made it compulsory for the Columbus Railway, Power & Light Company to install seats on its cars for motormen and conductors. The Mayor is of the opinion that the best means of providing rest for the car crews will be determined by experiments now being made by the company.

Two-Cent Fares Upheld in Illinois.—The supremacy of the Illinois 2-cent rate for passenger travel within the State was affirmed on Jan. 13 by Judge Landis in the United States District Court, when he dismissed, for want of equity, the petition of twenty-eight railroads operating in Illinois for an injunction to restrain the State authorities from prosecuting them for establishing a 2.4-cent rate, indirectly authorized by the Interstate Commerce Commission.

Rooke Registers in Brooklyn.—The Brooklyn (N. Y.) Rapid Transit Company has begun the use of the Rooke register in the collection of fares on the Hamburg Avenue surface line of the Canarsie Division, which also includes the Ralph-Rockaway, New Lots, Church and Ralph Avenue shuttle surface lines. In a statement to the public the company says: "Please have your nickel ready. This will ultimately promote the convenience of both passengers and conductors, because the making of change involves discomfort to both."

Skip-Stop Discontinued.—The operation of the skip-stop on the Bloomfield line of the Public Service Railway, Newark, N. J., has been discontinued. The Board of Public Utility Commissioners of New Jersey refused formally to approve the plan, although it took occasion to say that it believed such a method of operation would benefit the people of the several communities along the line. At the same time, as certain representatives of these communities objected to a continuance of the skip-stop, because of a division of opinion among their people, the commission decided not to act against the expressed wishes of the municipalities.

Ohio Men May Urge Eight-Hour Day and Seats for Motormen and Conductors.—Street railway men in Ohio are preparing to ask the Legislature for the enactment of laws that will give them an eight-hour day and seats for both motormen and conductors. They claim that their duties are fully as exacting as those of railroad engineers and conductors, and that they should receive the same consideration. On the other hand, they allege that the railway managers are urging greater speed all the time, and that cars are becoming more overcrowded every day. This, they say, is increasing their responsibilities to such an extent that, for the safety of themselves and their passengers, the work-day should be limited to eight hours. They expect to work through the Ohio State Federation of Labor for the legislation desired.

Spokane Jitneys Worked Overtime.—According to figures given out by the Spokane Motor Bus Association, jitneys in Spokane, Wash., during the past year carried more than 4,500,000 passengers. According to the figures of the association, there are seventy-two jitney buses operating in Spokane at the present time. While some of the jitney drivers take in as high as $14 a day, a fair average is $10 per day per jitney. Some of the jitneys have two drivers; that is, the car is operated on two separate shifts. Some of the drivers run as high as twelve hours a day, but a fair average is ten hours. A large percentage of the jitneys are Fords, and they average close to 20 miles on a gallon of gasoline; other jitney buses have special carburetors, and they make between 18 and 20 miles to the gallon. Each bus in Spokane covers approximately 200 miles a day.

Prizes for Safety Records in Dallas.—Plans for "safety first" and greater courtesy on the street railways of Dallas, Tex., have been announced by Richard Meriwether, superintendent of the Dallas (Tex.) Consolidated Street Railway. Cash prizes amounting to $500 will be awarded the team making the best accident record. The award will be made at the end of the year 1917. A democratic plan has been worked out whereby the trainmen will elect the captains of the different teams. A new council of efficiency has also been created, to meet on the first Tuesday of each month. It will be composed of seven captains of the teams, the inspectors, superintendent of transportation, claim agent, and general superintendent. The council will discuss the working conditions among trainmen and all matters pertaining to the safe operation of the local street railways.

Hearing on Jan. 31 on Closed Vestibules in New York.—On recommendation of C. W. Wilder, its electrical engineer, the Public Service Commission for the First District of New York has called a hearing for Jan. 31 at which will be considered the matter of minimizing the number of accidents to passengers boarding or alighting from surface cars. Reports made to the commission indicate that the chief means of eliminating or at least minimizing such accidents appears to be the installation of closed vestibules. The question of requiring this safeguard on all cars will be considered. In his memorandum to the commission, Mr. Wilder pointed out that studies of statistics gathered by the commission showed that boarding and alighting accidents "have practically disappeared in connection with cars equipped with closed vestibules and with center entrance cars."

Street Cars Have Right of Way Over Vehicles in Oakland, Cal.—A new traffic ordinance adopted by Oakland (Cal.) City Council on Dec. 15, 1916, contains some important provisions for facilitating the movement of traffic and insuring safety. According to the new ordinance, street cars have the right of way over all vehicles at all intersecting streets not controlled by police traffic officers. In approaching street cars which have stopped or are about to stop to permit passengers to alight or board, vehicles moving in the same direction as such cars must stop 10 ft. to the rear, unless they can pass the cars leaving 6 ft. between the vehicles and the steps of the cars, in which case they may proceed at a speed not greater than 10 m.p.h. Vehicles shall not approach or cross any intersecting street upon which there are street car tracks at a greater rate of speed than 10 m.p.h.

Conference Asked on Missouri-Illinois Fares.—The public utilities committee of the Board of Aldermen of St. Louis, Mo., was asked on Jan. 10 by the Illinois Traction Company to hold a public conference with officials of Venice, Granite City and Madison, Ill., at which the passenger fare question could be threshed out. The chairman of the committee said the committee was "very busy with other matters," and expressed doubt whether a hearing would be scheduled in the near future. The company was authorized some time ago by the Interstate Commerce Commission to increase the single fare between St. Louis and the so-called tri-cities across the river in Illinois from 5 cents to 10 cents and to establish certain commutation rates at an average fare between 5 cents and 10 cents. Threats of reprisals were made by the municipalities affected and in the case of St. Louis there is a bill pending before the public utilities committee of the Aldermen seeking to repeal the company's franchise there.

Buffalo Traffic Increase Taxes Railway Facilities.—Rush-hour traffic over the Buffalo, N. Y., city lines of the International Railway is breaking all previous records. More than 250 additional trainmen are being employed and within the next few weeks forty-one new and rebuilt cars will be placed in operation. Owing to the shortage of cars during the early morning and evening rush hours, the company has been forced to use large interurban cars on some of its lines. N. H. Brown, general superintendent of transportation, says that the company is making every effort to improve its service. Additional cars have been placed on all lines; more trainmen are being employed than ever before and on the East and West Utica lines, where passengers are forced to transfer, through service is maintained during the evening rush hours; express service is maintained from the large industries in the north end of the city to all parts of the east side, and the company is meeting the shortage of electric power by generating at its reserve plants power from steam.

Buses Owned by Traction Company Operate at Loss.—The Pacific Gas & Electric Company, which operates the electric railway system in Sacramento, Cal., has in service two gasoline-driven buses which were put on in response to a demand for service in certain outlying districts not reached by the company's tracks. The buses run over different routes in the eastern annexed portions of the city, one route being about a mile long and the other about 2 miles. Both buses are Ford automobiles, fitted with special bodies, and have a seating capacity of twelve each, including driver. Although the buses have been operating several months and the routes are well established, the company states that the revenue they bring in does not cover the operating cost. Several applications for similar bus service in other suburban districts have been refused by the company after a traffic count showed what traffic could be counted upon. It is the plan, however, to continue the bus service now operating for the convenience of the patrons served.

Company Move in Interest of Public Health.—The Beaver Valley Traction Company, New Brighton, Pa., through Superintendent W. H. Boyce, has given official notice in an advertisement in the Beaver *Times* that the most rigid rules for the protection of the health of passengers on Beaver valley cars will be observed. Owing to the prevalence of pneumonia, persons are asked to use more than usual care when sneezing or coughing while riding in the cars. The order also states that the rules against spitting in the cars will be rigidly enforced without the customary warning. In commenting on this action of the company the *Times* said: "In enforcing these regulations the company has in mind only the welfare of the traveling public and it desires to make traveling as safe as possible by taking every precaution against the spread of diseases. This is only another important step in the safety first campaign which the railway has been conducting through various lines of activity for several years. To promote the safety of the public, especially that portion of it which uses the street cars daily, or occasionally, the company has spent thousands of dollars. They will continue this good work through publicity work and other effective agencies in the future."

Personal Mention

Arthur C. Hume has been elected president of the Babylon (N. Y.) Railroad.

M. Cummings has been appointed roadmaster of the Oklahoma (Okla.) Railway.

T. F. Kaap has been appointed purchasing agent of the Evanston (Ill.) Railway.

A. Gardiner has been elected secretary of the Saskatoon (Sask.) Municipal Railway.

John MacDonald has been appointed track foreman of the City Railway, Dayton, Ohio.

Walter N. Munroe has been appointed manager of the Paris (Tex.) Transit Company.

E. S. Koller has been elected president of the Denver & Interurban Railroad, Denver, Col.

F. D. Aiken has been elected president of the City & Suburban Railway, Brunswick, Ga.

Harry Murphy has been appointed roadmaster of the Columbus, Magnetic Springs & Northern Railway, Richwood, Ohio.

John Treanor has been elected vice-president of the Glendale & Montrose Railway, Glendale, Cal., with office in Los Angeles.

J. A. Spaulding has been appointed auditor of the Lake Charles Railway, Light & Water Works Company, Lake Charles, La.

John F. Esch has been appointed purchasing agent of the Cripple Creek & Colorado Springs Railroad, Colorado Springs, Col.

H. C. Pinnock has been appointed claim agent of the Cripple Creek & Colorado Springs Railroad, Colorado Springs, Col.

J. J. Cogan has been appointed general manager of the Cripple Creek & Colorado Springs Railroad, Colorado Springs, Col.

Dwight M. Lewis has been appointed a member of the Iowa Board of Railroad Commissioners, succeeding Clifford Thorne, resigned.

E. L. Byington has been appointed chief inspector of the United Railroads of San Francisco, San Francisco, Cal., succeeding W. J. Wright.

M. McCants has been appointed assistant to William Von Phul, general manager of the United Railroads of San Francisco, San Francisco, Cal.

J. A. Guiher, a member of the Iowa Board of Railroad Commissioners, has been appointed chairman of the board, succeeding Clifford Thorne, resigned.

M. L. Ross has been appointed superintendent of the Vincennes (Ind.) Traction Company to succeed Louis J. Fohr, resigned to enter the insurance field.

George D. Murphy, master mechanic of the Columbus, Magnetic Springs & Northern Railway, has been appointed general manager to succeed Charles J. Fifer.

Edmund I. Bowen, formerly superintendent of the Rochester electric division of the Erie Railroad, has been transferred as superintendent to the Marion division of this railroad.

A. G. Hoyt has been elected president of the American Public Service Company, New York, N. Y., which controls the Marshall (Tex.) Traction Company and other utilities in Texas.

Matthew C. Brush, president of the Boston (Mass.) Elevated Railway, was elected to the board of directors of the Second National Bank in Boston at its annual meeting on Jan. 10.

H. W. Wischmeyer, superintendent of electrical equipment of the Louisville (Ky.) Railway, will hereafter also have charge of the steam equipment for the company, succeeding Frederick L. Ray, resigned.

J. A. Vandergrift, of J. A. Vandergrift & Company, engineers and contractors, New York, has been elected president of the Slate Belt Electric Street Railway, Pen Argyl, Pa., succeeding C. H. Latta, resigned.

H. D. Swain has been appointed superintendent of the Peekskill Lighting & Railroad Company, Peekskill, N. Y. He is also secretary and treasurer of the Putnam & Westchester Traction Company, Peekskill, N. Y.

A. L. Mathews has been elected a vice-president of the J. G. White Management Corporation, New York, N. Y., to take charge of a new department which has been organized for the management of sugar properties.

Henry C. Paul, treasurer of the Fort Wayne & Northern Indiana Traction Company and president of the Old National Bank of Fort Wayne, Ind., has resigned the former office to give his entire time to his duties with the bank.

J. W. Osborne, formerly master mechanic of the Chicago & Milwaukee Electric Railroad, Highwood, Ill., has resigned that position to become master mechanic of the Terre Haute, Indianapolis & Eastern Railway, at Lebanon, Ind.

Frederick L. Ray, superintendent of steam equipment of the Louisville (Ky.) Railway, has resigned his office and gone to Indianapolis, Ind., where he has become superintendent of power plants for the Merchants' Heat, Light & Power Company.

F. S. Nicholson, for the past eight years vice-president and general manager of the Sayre (Pa.) Electric Company, will succeed Byron T. Burt as vice-president and general manager of the Rutland Railway, Light & Power Company, Rutland, Vt. He will remain a vice-president of the Sayre property.

F. J. Haas, who has been secretary of the Public Utilities Company, Evansville, Ind., has been elected vice-president and general manager of the company to succeed A. C. Blinn, whose election as vice-president, treasurer and general manager of the Northern Ohio Traction & Light Company was noted in the ELECTRIC RAILWAY JOURNAL of Dec. 2, 1916.

Charles J. Fifer, general manager of the Columbus, Magnetic Springs & Northern Railway, Richwood, Ohio, has been appointed general manager of the Cleveland, Alliance & Mahoning Valley Railroad, with offices at Ravenna, Ohio. Mr. Fifer still retains the secretaryship of the former company. He was formerly general manager of the Philadelphia, Coatesville & Lancaster Passenger Railway, Parkesburg, Pa.

Winthrop More Daniels on Jan. 10 had his nomination confirmed by the United States Senate as a member of the Interstate Commerce Commission. Mr. Daniels, who has served two years as a member of the commission, was reappointed early in December by President Wilson for a full seven-year term. Mr. Daniels has served as chairman of the Board of Public Utility Commissioners of New Jersey. He was formerly professor of political economy at Princeton University, a chair which he held from 1892 to 1911.

Dwight Burroughs, who came to the United Railways & Electric Company, Baltimore, Md., last May as publicity manager, is editor of the new employees' magazine, *The United Railways Forum*, the first issue of which has just been published, and which was described in the News Department of the ELECTRIC RAILWAY JOURNAL for Jan. 13. Mr. Burroughs has been principally a newspaper man, although he has done some magazine and book writing and has at different times acted as publicity manager for various causes. For a number of years and up to the time of his recent position he was city editor of the *Baltimore News*.

Byron T. Burt, for the past two years vice-president and general manager of the Rutland Railway, Light & Power Company, and allied interests in and near Rutland, Vt., has resigned to take a responsible position with another organization. Mr. Burt was formerly manager of the Chattanooga (Tenn.) Electric Company until its consolidation with the Chattanooga Railway & Light Company. When the Chattanooga & Tennessee River Power Company was organized to construct the hydroelectric plant at Hale's Bar, on the Tennessee River, he was made general manager of the company. He later resigned that position to become vice-president of the Rutland Railway, Light & Power Company.

M. F. Flatley, formerly master mechanic at the Lebanon shops of the Terre Haute, Indianapolis & Eastern Traction Company, in charge of equipment on the Northwestern, Martinsville, Crawfordsville and Lebanon divisions, resigned on Jan. 1 to become master mechanic of the Dayton & Troy Electric Railway. Mr. Flatley became master mechanic of the Terre Haute, Indianapolis & Eastern Traction Company's property in June, 1915, and was previously employed for six years as master mechanic on the Rochester, Syracuse & Eastern Railway. He was also employed by the Brooklyn Rapid Transit System as foreman of the elevated division for four and one-half years, and served three years as foreman of car equipment on the elevated division of the Interborough Rapid Transit System. He began his experience in electric railway work with the Westinghouse Electric & Manufacturing Company, where he spent three years. Mr. Flatley is the inventor of a number of car appliances.

James M. Barrett has resigned as president of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind. He has been associated with the road since it was an insignificant horse-car line, the law firm of which he is a member having continuously looked after the legal affairs of the company. Mr. Barrett resigns the presidency in order to give himself entirely to the business of his law firm. Mr. Barrett was born on a farm in La Salle County, Ill., on Feb. 7, 1852. He entered the University of Michigan in 1871, and was graduated in the academic department in 1875. He studied law at Chicago and Princeton, Ill., and afterward at Fort Wayne, Ind., and was admitted to the bar in 1876. In 1881 Mr. Barrett was elected a director and appointed counsel for the local street railway system in Fort Wayne, and thereafter he continued as director and counsel until the organization of the Fort Wayne & Wabash Valley Traction Company, which acquired the local street railway systems in Fort Wayne and the interurban lines running from Fort Wayne to Peru and Lafayette, and from Fort Wayne to Bluffton, Ind. He was then appointed general counsel for the Wabash Valley company, and continued as such until its property and franchises were acquired by the Fort Wayne & Northern Indiana Traction Company, after which he became vice-president, director, general counsel and president of that company, until his recent resignation. Mr. Barrett served as a member of the Indiana Senate in the sessions of 1887 and 1889, and was a trustee of Purdue University, Lafayette, Ind.

C. F. Handshy, assistant general manager, Illinois Traction System, was elected president of the Illinois Electric Railway Association at its annual meeting in Chicago Jan. 19. Mr. Handshy is one of the successful railway operators who has come up through the ranks to places of responsible activity. He began his career in the steam railway field as a telegraph operator for the Wabash Railroad in 1884. Six years later he became train dispatcher of the same company and in 1902 was promoted to the position of assistant chief dispatcher at Decatur, Ill. Two years later he succeeded to the position of chief dispatcher and then to trainmaster in 1905. On Sept. 15, 1907, the Illinois Traction System secured his services and he entered the electric railway field as general superintendent of transportation of interurban lines for this company. In January, 1910, he was appointed general superintendent of interurban lines, and on June 1, 1913, became assistant general manager. Mr. Handshy's nine and one-half years' experience with the problems of electric railways in Illinois should bring a constructive program to the year's activities in the Illinois Association.

C. F. HANDSHY

Obituary

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H. G. STOTT

Henry Gordon Stott, superintendent of motive power of the Interborough Rapid Transit Company and the New York Railways of New York, died at his home in New Rochelle on Jan. 15 after an illness of many months. He was a native of the Orkney Islands, Scotland, where he was born in 1866. On leaving the Watson Collegiate School, Edinburgh, he entered the College of Arts and Sciences at Glasgow, and began a course in mechanical engineering and electricity, graduating in 1885. In the year previous he had entered the employ of the electric illuminating company of Glasgow. Shortly after graduating he was made assistant electrician on board the steamship *Minia*, belonging to the Anglo-American Telegraph Company. The next four and one-half years saw him engaged with those duties, during which period he undertook a number of experiments that resulted in the introduction of improved methods of handling cable repairs. He was also identified with the "duplexing" of the United States Cable Company's main cable, 2750 knots, the longest duplex cable in the world.

In 1889 Mr. Stott was made assistant engineer of the Brush Electric Engineering Company at Bournemouth, England. The following year he was offered a position by Hammond & Company as assistant engineer in the construction of an underground cable and power plant at Madrid, Spain. He remained there until 1891, coming to the United States in that year to install an underground cable and conduit system for the Buffalo Light & Power Company, now the Buffalo General Electric Company. Later he became engineer of the company, and during the next ten years was one of the most active figures in the industrial progress of Buffalo. His efforts attracted wide attention, and in 1901 he was appointed superintendent of motive power of the Interborough Rapid Transit Company, New York City, a position which he filled with signal success. At the time he took up these duties the Interborough had not yet been organized, the company having the title of the Manhattan Railway Company. The position to which Mr. Stott was called had just been created, and it devolved upon him to organize the operating force, in connection with which he completed the Seventy-fourth Street power plant of the company, various substations and transmission lines. When the Manhattan system was amalgamated with the Interborough in 1904 Mr. Stott retained his office with the new corporation and immediately took over supervision of the construction of the power plant on Fifty-ninth Street.

Mr. Stott was elected president of the American Institute of Electrical Engineers for the term 1907-1908, vice-president of the American Society of Mechanical Engineers for the term 1912-1914, director of the American Society of Civil Engineers in 1911, and was vice-president and trustee of the United Engineering Society at the time of his death. Up to the last Mr. Stott was a recognized power in the American Institute of Electrical Engineers and was a member of the standards committee, the Public Policy Committee, the Committee on Development of Water Power, the United States National Committee of the International Electrotechnical Commission, the Power Stations Committee, the Committee on Economics of Electric Service, the Edison Medal Committee, and was one of the institute's representatives on the joint committee on the metric system, of which he was an ardent advocate. Among the large number of papers which Mr. Stott wrote on engineering problems are "The Conversion and Distribution of Received Currents," "Power Plant Economics," "Notes on the Cost of Power," "Steam Pipe Covering and Its Relation to Station Economy," "Tests of a 15,000-Kw. Steam Engine Turbine Unit," "Power Plant Design and Operation," etc.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

FRANCHISES

Fullerton, Cal.—The Los Angeles Railway has asked the City Council for a fifty-year franchise to construct a line in Fullerton.

Gary, Ind.—Charles D. Davidson, receiver of the Gary & Interurban Railroad, has asked the City Council of Gary for a franchise to construct extensions on Broadway, Fifth Avenue, Eleventh Avenue, Clark Road, Ninth Avenue, Buchanan Street, Virginia Street, Mississippi Street and Taft Street.

Cincinnati, Ohio.—It is reported that an ordinance has been introduced in the City Council granting authority to the Cincinnati, Newport & Covington Railway to construct a line on Third Street between Vine and Walnut Streets. The ordinance further provides for the abandonment of the present track on Second Street and on Walnut and Vine Streets, south of Third Street.

Elyria, Ohio.—The Cleveland, Southwestern & Columbus Railway has announced it would accept the franchise which had before been rejected by the company and had been twice vetoed by Mayor Charles E. Tucker and passed by the Council over his veto. The franchise grants six tickets for 25 cents and provides for extension of service to the factory district of the East End.

Dover, Pa.—The Dover-Rossville Transit Company, recently granted a franchise to operate trackless trolley cars in York County, will ask the Public Service Commission of Pennsylvania next week for permission to exercise its franchise.

Oakhurst, Pa.—The City Council of Oakhurst has repealed the franchise granted to the Johnstown Traction Company for a line through that borough. The company failed to begin work within the required period of two years after the granting of the franchise.

Union, S. C.—A franchise has been granted by the City Council for the construction of an electric railway in Union. Under the franchise the work must be begun by April 1 and some of the lines must be in operation by Jan. 1, 1918. E. F. Kelly, B. F. Kennedy and A. G. Kennedy, Union, are interested. [Jan. 6, '17.]

Salt Lake City, Utah.—The Emigration Canyon Railroad has received a franchise from the Council to construct an extension up Big Cottonwood Canyon and Little Cottonwood Canyon.

TRACK AND ROADWAY

San Diego (Cal.) Electric Railway.—The San Diego Electric Railway will begin immediately the construction of an extension from the east gate of Balboa Park to University Avenue, past the Normal School, to Adams Avenue, approximately 1½ miles. A 114-lb. rail will be used. The line will traverse a private right-of-way and will cross Powder Canyon and two smaller canyons. Steel for bridges across these canyons has been ordered.

Hillsborough-Pinellas Interurban Railway, Tampa, Fla.—The Hillsborough-Pinellas Interurban Railway has placed $2,000,000 of bonds, and construction of its proposed line to connect Tampa, Tarpon Springs, Clearwater, St. Petersburg and intermediate points, about 60 miles, will probably begin within a month. Martin Carabello, Tampa, secretary. [July 29, '16.]

Savannah (Ga.) Electric Company.—This company plans to construct an extension south on Abercorn Street to a point beyond Fiftieth Street.

Honolulu Rapid Transit & Land Company, Honolulu, Hawaii.—This company reports that it will construct 8600 ft. of new track during 1917, material for which has been ordered.

Chicago, Fox Lake & Northern Electric Railway, Chicago, Ill.—The Chicago, Fox Lake & Northern Electric Railway has purchased a terminal site on North Clark and Howard Streets, and will utilize the roadbed constructed five years ago by a company which abandoned its plans before any track was laid. The Public Utilities Commission of Illinois has approved a bond issue of $750,000 and enough stock has been sold to assure the immediate construction of the proposed line. L. K. Sherman, Chicago, chief engineer. [Jan. 13, '17.]

Chicago Heights Street Railway, Chicago, Ill.—This company will construct 1 mile of new track during 1917.

Kewanee & Eastern Electric Railway, Kewanee, Ill.—The Public Utilities Commission of Illinois has granted a permit to the Kewanee & Eastern Electric Railway to construct a line from Kewanee to Henry Junction, about 42 miles. C. G. Lampman, Cedar Rapids, is interested. [Sept. 9, '16.]

Union Traction Company, Anderson, Ind.—This company is erecting a new bridge at Summitville, Ind.

Cincinnati, Bluffton & Chicago Railroad, Huntington, Ind.—It is reported that J. M. Wilson, Cincinnati, who has recently purchased the Cincinnati, Bluffton & Chicago Railroad, will construct an extension from Portland to Cincinnati via Union City, Richmond and Hamilton, and from Huntington to South Bend via Columbia City and northern lake resorts.

Rumford Falls & Bethel Street Railroad, Rumford, Maine.—The Public Utilities Commission of Maine has rendered a decision authorizing the Rumford Falls & Bethel Street Railway to issue and sell at par its common stock, in an amount not exceeding $70,000, and its 6 per cent preferred capital stock, in an amount not exceeding $50,000, proceeds of such sales to be used in the work of constructing and equipping its proposed line in Mexico and Rumford. [Nov. 4, '16.]

Detroit (Mich.) United Railway.—A report from the Detroit United Railway states that the company plans to construct 29 miles of new city track and 47 miles of interurban line between Highland Park and West Utica and between Oakwood and Dearborn.

Duluth (Minn.) Street Railway.—This company reports that during 1917 it will construct 3.13 miles of city track.

Salem & Pennsgrove Traction Company, Salem, N. J.—Through operation on this company's line from Salem to Pennsgrove was not begun on Jan. 15, as announced by the company. Work had not progressed as far as had been hoped, and it is not known definitely when the line will be completed. Cars have been operated by the company for several months between Pennsgrove and the du Pont powder villages and camps at Carney Point.

International Railway, Buffalo, N. Y.—This company reports that during 1917 it will construct 32 miles of new track between Buffalo and Niagara Falls and 8.8 miles of new track in Buffalo.

Panama Traction Company, Jamestown, N. Y.—Track construction has been begun on this company's proposed line from Ashville to Panama. One bridge has been completed near Ashville and work has been begun on another bridge over Goose Creek, near Blockville. The line will be operated by motor car. B. L. Davis, Lakewood, is interested. [Dec. 30, '16.]

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York recently received bids for the construction of the Livonia Avenue elevated extension of the Eastern Parkway Subway in Brooklyn. In the effort to obtain the lowest prices in steel and steel erection, bids for the work were received in three forms. Under one form bids were received for construction including the supply of steel and under two other forms for construction, and for furnishing steel. The lowest bid for construction including the supply of steel was received from the Oscar Daniels Company, New York, at $1,775,508. The lowest bidder for construction exclusive of furnishing steel was W. G. Cooper, New York, whose bid was $257,164. The lowest bid for furnishing steel was that received from the American Bridge Company, New York, whose proffer was $1,431,755.

Toronto (Ont.) Railway.—An order was recently issued by the Ontario Railway and Municipal Board requiring the Toronto Railway to construct a double-track line on Carlaw, Guelph and Pape Avenues, and to operate a car service thereon in order to relieve the traffic congestion in the east end of the city. The company is ordered to commence work not later than April 1 next and to have it completed by July 1. Plans for the work are to be submitted to the board for approval not later than Feb. 1. The city, however, is given permission to object against the route ordered, and may suggest an alternative route. Should the city recommend an alternative plan, the board reserves the right to either approve or reject it. Should it be rejected, the order issued will stand.

Portland & Oregon City Street Railway, Portland, Ore.—It is reported that a bond issue of $350,000 will soon be made by the Portland & Oregon City Street Railway to construct an extension of its line from the present terminus 15 miles southeast of Portland to the Viola-Highland country. No plans have as yet been made for beginning the construction work.

Allen Street Railway, Bethlehem, Pa.—The Public Service Commission of Pennsylvania in an opinion handed down Jan. 15 by Chairman Ainey approved the plans for an overhead crossing to be constructed by the Allen Street Railway over tracks of the Lehigh & New England Railroad near Bath. The opinion states that the entire cost of the construction and payment of consequential damages is to be borne by the street railway company, but the railroad company, having offered to pay $2,000 toward the improvement, is directed to do so.

Hull (Que.) Electric Company.—This company reports that it will construct about 2½ miles of new track in Hull during 1917.

Jackson Railway & Light Company, Jackson, Tenn.—Improvements totaling an expenditure of about $90,000 were begun during the past year by the Jackson Railway & Light Company, which will be finished during the first half of 1917. The sum of $65,000 will be spent on laying new steel rails over the city and $20,000 will be used to enlarge the present power house of the company, on South Royal Street, to handle the increased light and power business. New rails are now being laid on Royal Street from the Nashville, Chattanooga & St. Louis Railroad depot to Allen Avenue, and work will soon be started on the laying of new rails on Highland Avenue from Main Street North. Main Street will be double-tracked to facilitate traffic from Royal Street West to Market.

El Paso (Tex.) Electric Company.—The El Paso Electric Company has increased its capital stock $1,000,000 to take care of improvements to its system. The installation of the underground wire system in the business district will cost about $300,000, it is said. Other improvements include the installation of a substation for supplying power to the Government Hill and Fort Bliss lines.

Marlin-Temple Interurban Company, Marlin, Tex.—Surveys have been completed by the Marlin-Temple Interurban Company on its proposed line from Marlin to Temple, and work of grading the line will soon be begun. S. D. Hanna, Temple, chief engineer. [Nov. 11, '16.]

San Angelo, Tex.—J. D. Sugg, formerly president of the San Angelo Power & Street Railway, has been ordered by the City Commission to remove the tracks and equipment of the San Angelo Power & Street Railway from the streets. The line will be replaced by a system to be constructed by the Interstate Electric Corporation of New York.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—It is reported that the Salt Lake & Utah Railroad has under consideration the construction of an extension to Salina Canyon.

Steubenville, Wellsburg & Weirton Railway, Wellsburg, W. Va.—It is reported that the West Penn Power Company, Connellsville, Pa., has purchased the Steubenville, Wellsburg & Weirton Railway, which operates an electric railway between Wellsburg, Follansbee, Steubenville, Holiday's Cove and Weirton. Extensions and improvements will be made.

Madison (Wis.) Railways.—This company will construct ¾ mile of new track during 1917.

SHOPS AND BUILDINGS

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has awarded to the Seventh Avenue Construction Company, New York, a contract for finishing six of the stations on the underground portion of the Southern Boulevard and Westchester Avenue extension of the Lexington Avenue subway. The stations will be located at Brook Avenue, Cypress Avenue, East 143d Street, East 149th Street, Longwood Avenue and Hunts Point Road, the station last named to be an express stop. All work is to be completed within six months, the contract price being $239,616.05.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.—Practically all arrangements have been completed by this company for the construction of a passenger and freight station at the corner of Liberty and Lincoln Way East, Galion.

Toledo Railways & Light Company, Toledo, Ohio.—It is reported that a contract has been awarded by Henry L. Doherty & Company, New York, to A. Bentley & Son, 210 Belmont Avenue, Toledo, for the construction of the new power station at Toledo.

Eastern Pennsylvania Railways, Pottsville, Pa.—The carhouse and power house of the Eastern Pennsylvania Railways at Palo Alto, recently damaged by fire, will be rebuilt immediately.

Salt Lake & Ogden Railway, Salt Lake City, Utah.—This company plans to construct new stations at Kaysville and Sunset this year at a cost of about $10,000. Improvements will also be made in the track facilities at the Salt Lake Union Stock Yards and it is probable that a station will be erected there.

POWER HOUSES AND SUBSTATIONS

Danville Street Railway & Light Company, Danville, Ill.—The Danville Street Railway & Light Company plans to install a 5000-kva. General Electric turbine in its powerhouse.

Iowa Railway & Light Company, Cedar Rapids, Iowa.—Plans are being prepared by the Iowa Railway & Light Company for the construction of a powerhouse on North Sixth Street East, to cost about $20,000.

Northern Ohio Traction & Light Company, Akron, Ohio.—It is reported that the Northern Ohio Traction & Light Company plans the construction of a substation at Massillon.

Reading Transit & Light Company, Reading, Pa.—This company has just placed in service a 12,500 kw. turbo-generator in addition to its former equipment. Power business already contracted for will absorb this capacity and an additional generator of 25,000-kw. capacity has been ordered for delivery in 1918 to take care of further business in prospect.

Beaumont (Tex.) Traction Company.—Plans are being considered by the Beaumont Traction Company for the erection of an electric transmission line between Beaumont and Port Arthur, and also for increasing the output of the two power plants.

Southern Traction Company, Dallas, Tex.—Plans have been made by the Southern Traction Company and the Texas Light & Power Company for the construction of a power plant on the Oklahoma side of the Red River north of Denison. The site for the plant has been acquired in Bryan County and the Oklahoma Legislature will grant the easement asked.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—A contract has been awarded by the Milwaukee Electric Railway & Light Company for the construction of an addition to its power plant at Racine to the J. F. Greene Engineering Company, Racine.

Sheboygan Railway & Electric Company, Sheboygan, Wis.—The Milwaukee & Fox River Valley Railway, which is leased by the Sheboygan Railway & Electric Company, contemplates the construction of a hydroelectric plant, including dam across the Mullett River.

Manufactures and Markets

Discussions of Industrial Conditions
A Department for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Business Announcements Trade Literature

An Invitation to Discuss Purchasing Problems

This Department an Open Forum—Discussions of Problems of Mutual Interest to Buyer and Seller Are Invited—One Subject Is Suggested

The purchasing agent of the present must be alive. Things are happening every day to change the well-laid plans of yesterday. To fulfill the requirements of his job well the purchasing agent must keep informed on the trends of the general market so that he may better be able to sense the many ups and (few) downs of his own market. He must be active in locating available sources of supply and in accelerating deliveries. In fact, the purchasing agent of to-day has a bigger job than any of his predecessors ever had.

The columns of this department have presented much evidence of purchasing activity. They have set forth the views of many important men on manufacturing and marketing conditions, and have discussed those topics which are of great mutual interest to the buyer and seller.

In the many interviews with purchasing agents and manufacturers a desire to be helpful to both has been kept in mind. This department is an open forum. Are there not questions which now might well be jointly discussed? If so, the ELECTRIC RAILWAY JOURNAL would appreciate the opportunity of presenting them.

Consider, for example, the topic of "Buying Repair Parts on an Annual Basis," which was presented on page 1184 of this paper for Dec. 2, 1916. Should an electric railway buy its material on an annual basis, with specified prices and deliveries? There are, no doubt, some materials and supplies which lend themselves very well to this method of purchase and the net results benefit both buyer and seller. Such being the case, how are prices to be fitted to possible fluctuations of the industrial labor and material market? Unless some such provision is made, long-term buying becomes speculation, and a public utility should not speculate.

In consideration of these facts, the buying of electric railway materials on an annual basis might well be discussed. The ELECTRIC RAILWAY JOURNAL will be pleased to receive the views of purchasing agents and manufacturers on this and any other topics of interest.

Railways Show Co-operative Spirit

Brakeshoe Manufacturer Reports Roads as Showing Appreciation of Present Industrial Situation

Everybody has his troubles these days, and particularly the manufacturer who supplies service and materials on a long-time contract basis. Hence, when one of them reports the cheerful co-operation of his customers tending to relieve the stress, it is a pleasure to record the facts. Frank Gordon, western sales manager, American Brake Shoe & Foundry Company, says that he and his associates deeply appreciate the way in which the electric railway managers have come to the front and have shown their appreciation of the exceptional conditions at present surrounding the sale of materials and service contracted for long in advance of the present market conditions.

Many roads purchase brakeshoes on a guaranteed basis of cost per 1000 miles. Contracts are made for a term of years. These contracts contemplate much which falls under the name, "service." They are intended to express the true spirit of co-operation. For one thing, the manufacturer supplements the work of the railway company's engineers by making extended studies of operating conditions, and by regular expert supervision, all of which is intended to reduce the cost of braking and brakeshoes. The road benefits from a reduction of costs as well as the manufacturer.

With the advent of complex manufacturing conditions, the manufacturers found that many long-term contracts were being filled at a loss due to circumstances over which neither the railway nor the manufacturer had any control. At the time contracts were made no provision for meeting present conditions could possibly have been foreseen. The prices of the metals now required for manufacturing purposes—cast-iron, steel plate, crucible steel and scrap iron—are sky-high. Steel plate, for instance, has risen from $40 to $100 a ton, and the average rise of all materials has been between 100 per cent and 200 per cent.

Relief from contract prices made earlier seemed a reasonable expectation, and this has come voluntarily from many roads which, appreciating the situation, are now cheerfully co-operating.

Warning Sounded by Wire Manufacturing Company

While Prospects for the 1917 Wire Market Are Bright Buyers of Insulated Wire and Cable Are Warned to Purchase for Actual Needs Only

Speculation is running wild over the prospects for the new year. One thing, however, is certain. The first sign that the nations of Europe are ready to consider peace proposals will be accompanied by a break in the raw-materials market and a slump in the value of stocks on hand. This statement is well borne out by the reaction in the copper market on the news of Teutonic peace proposals. Prices of raw materials are undoubtedly inflated and will therefore tumble, not far, perhaps, for some time, when peace becomes somewhat certain.

In view of these facts the following paragraphs from the current number of *The Wire Message*, published by Habirshaw Electric Cable Company, Inc., and The Electric Cable Company, are significant.

"In the insulated wire and cable industry we find evidence of sound prosperity. Statistics show that in 1914 less than 2 per cent of our total production of insulated conductors left the country, and in the favorable conditions of 1915 between 4 per cent and 5 per cent. Exporters of goods manufactured in this country, who were able previous to the war to successfully compete with European goods, certainly can do so after the war. Reasonable profits have made possible increased facilities and higher efficiency. Most factories are working overtime and orders are booked that cannot be delivered until well into 1917. Reports from all sections of the country indicate no curtailment of demand in the near future. Some decrease in purchasing activity that would bring demand near to maximum production should be welcomed rather than feared. The industry as a whole has never faced a new year with brighter prospects. It has but one thing to fear.

"WARNING

"When great business activity exists and supplies of all kinds are difficult to obtain, there is a strong temptation to over-buy. Speculation of this kind, especially at top prices, may lead to disastrous results, though basic conditions of business may be sound. Our warning is to buy for actual needs only and we cannot make this warning too strong. We reiterate our belief that the wire and cable industry, and business in general, faces a year of great prosperity, but it would be fatuous to believe that abnormal conditions will continue to prevail. Sooner or later there must be an adjustment to the normal. When this comes those who have bought in excess of their needs will be under strong temptation to pass along their losses by endeavoring to cancel unfilled orders and outstanding contracts. This attitude is wrong, and a much harsher term might rigidly be applied to it. We are not speculating in raw materials, but are buying only to take care of orders and contracts in hand. We assume these were given us in good faith and to supply legitimate needs, and we shall insist upon the acceptance of all goods covered by such contracts and orders, under the exact terms and conditions on which they were accepted. To avoid misunderstanding we stamp all quotations and invoices as follows:

"'Owing to the extraordinary conditions which now exist, and the cost of labor and materials, all quotations made and orders accepted with the absolute understanding that material will be taken in full quantities and without change of specifications.'"

Foreign Trade Conference

At Meeting in Pittsburgh, Foreign Markets, Trade Development, and the Webb Bill Will Be Principal Topics

According to present appearances there will be a large attendance at the national foreign trade conference to be held at Pittsburgh on Jan. 24, 25 and 26 for the discussion of all after-the-war problems. The call for this trade conference has been issued by James A. Farrell, chairman of the National Foreign Trade Council and president of the United States Steel Corporation. The call asks for a study of the problems of America's foreign markets after the war, such as the foreign trade aspect of the American tariff system; co-operation in foreign trade development; the American merchant marine; foreign investment of American capital as an aid to oversea commerce; and problems of the smaller manufacturer and merchant.

An entire session will be devoted to the necessity of legislation, authorizing co-operation among American exporters who are now individually obliged, through the doubt surrounding the application of the anti-trust laws, to cope with government-encouraged combinations of foreign rivals. The legislation is provided by the Webb bill, advocated by the federal trade relations commission.

Air Brake and Signal Companies Merged

The plan for the merger of the Union Switch & Signal Company into the Westinghouse Air Brake Company, noted in the ELECTRIC RAILWAY JOURNAL of Dec. 16, 1916, page 1279, was formally declared effective on Jan. 12. At a special meeting of the board of directors of the air brake company it was anounced that practically all of the stock of the Union Switch & Signal Company had been deposited in assent of the plan.

Later a meeting of the directors of the switch company was held for the purpose of reorganization and giving air brake officers representation on the board of directors.

The officers of the Westinghouse Air Brake Company chosen are as follows: Chairman of the board, W. D. Uptegraff, formerly president of the Union Switch & Signal Company; president, A. L. Humphrey, first vice-president and general manager of the air brake company; vice-president, John F. Miller, president of the air brake company; vice-president and treasurer, T. W. Siemon, formerly vice-president of the signal company; vice-president in charge of sales, G. A. Blackmore, formerly manager of sales of the signal company; acting vice-president and secretary, T. S. Grubbs, formerly secretary of the signal company; controller, C. A. Rowan, controller of the air brake company; auditor, F. V. Shannon, formerly auditor of the signal company; assistant treasurer, M. K. Garrett, who was associated with George Westinghouse's private office in an accounting capacity for twenty-five years.

The directors of the air brake company have called a special meeting of stockholders for March 15 to ratify the merger and also to approve an increase in the capital of the company from $20,000,000 to $30,000,000 to finance the transaction. Out of the increased capital it is proposed to declare a stock dividend of 20 per cent to holders of air brake stock, including the shares exchanged for the stock of Union Switch & Signal Company.

Car Shortage Decreased 50 Per Cent in Last Two Months

The freight car shortage which in November was becoming increasingly serious has decreased almost 50 per cent since that time, according to the figures for Jan. 1, 1917, which the American Railway Association has just made public. On Nov. 1 there was a shortage of 114,908 freight cars; on Dec. 1, as noted in the ELECTRIC RAILWAY JOURNAL of Dec. 30, 1916, page 1372, it was 107,778, and on Dec. 31 it had fallen to 59,892 cars.

This decrease in the car shortage is attributed more than anything else to the co-operative efforts of the Interstate Commerce Commission, shippers and the railroads. The latter for the past two months have had a special committee of the American Railway Association to deal with the subject. Emergency measures have been adopted to meet the abnormal situation, and progress has been made in getting cars out of the congested districts into the territory where they are most needed.

CURRENT PRICES FOR MATERIALS

Quoted Thursday, Jan. 18

Copper (electrolytic)	New York, 29 cents per pound
Rubber-covered wire (base)	New York, 38 cents per pound
Tin (straits)	New York, 45 cents per pound
Lead	New York, 7.65 cents per pound
Spelter	New York, 10 cents per pound
Rails, A. S. C. E., O. H	Mill, $40 per gross ton
Rails, A. S. C. E., Bess	Mill, $38 per gros ston
Wire nails	Pittsburgh, $3 per 100 pounds
Cement (carload lots) without rebate for sacks	New York, 1.97 per barrel
Cement (carload lots)	Chicago, $1.96 per barrel
Cement (carload lots)	Seattle, $2.20 per barrel
Linseed oil (raw, 5-bbl. lots)	New York, 94 cents per gallon
Linseed oil (boiled, 5-bbl. lots)	New York, 95 cents per gallon
White lead (100-lb. keg)	New York, 9¾ cents per pound
Turpentine (bbl. lots)	New York, 56½ cents per gallon

OLD METAL PRICES

Copper (heavy)	New York, 28.5 cents per pound
Copper (light)	New York, 24 cents per pound
Red brass	New York, 17 cents per pound
Yellow brass	New York, 17.5 cents per pound
Lead	New York, 6.75 cents per pound
Steel car axles	Chicago, $40 per net ton
Iron car wheels	Chicago, $19 per gross ton
Steel rail (scrap)	Chicago, $24.50 per gross ton
Steel rail (relaying)	Chicago, $30 per gross ton
Machine shop turnings	Chicago, $9.50 per gross ton

ROLLING STOCK

Columbus Railway, Power & Light Company, Columbus, Ohio, expects to purchase ten cars and, in addition, will rebuild eight cars of the summer type during the year.

Smolensk (Russia) Municipal Tramway has purchased the property of the Smolensk Electric Company. It is expected that American manufacturers will supply the necessary material and equipment to develop this property.

Cleveland (Ohio) Railway, on Dec. 26, had its plan of rebuilding fifty trail cars approved by the city council. The company has agreed to build three all-steel cars as a test but the remainder of the fifty will be a combination of steel and wood, similar to those in use at the present time.

Preston Car & Coach Company, Preston (Ontario), Canada, on Jan. 7 lost eight cars in a fire which completely destroyed the company's large erection shop. It is estimated that the total loss will be about $150,000. D. M. Campbell, managing director of the company, said that work would be resumed at once in the company's other buildings.

TRADE NOTES

Templeton, Kenly & Company, Ltd., Chicago, Ill., have furnished the Havana (Cuba) Central Railroad with two No. 318 simplex pole jacks.

Cambria Steel Company, Johnstown, Pa., is contemplating the erection of two new blast furnaces and a new plant to make car wheels. The total estimated cost is $7,000,000.

H. Denton White has been elected president of the Laconia Car Company to succeed C. S. Hawley, who resigned to accept the position of treasurer of the Remington Arms-Union Metallic Cartridge Company.

Charles Houchin Higgins, 165 Broadway, New York, N. Y., engineer and architect, announces the removal of his offices from the Hudson Terminal to the City Investing Building. Joseph R. Greenwood will be associated with Mr. Higgins in the future.

R. N. Chipman, who for a number of years has been manager of the Atlas Preservative Company of America, Inc., is now president of the Chipman Chemical Engineering Company, Inc., which has acquired the business of the former company, as noted in the ELECTRIC RAILWAY JOURNAL of Jan. 6.

Consolidated Car Heating Company, Albany, N. Y., announces that at a meeting of the board of directors, held at Albany on Monday, Jan. 15, Frederic Pruyn was elected secretary succeeding Edward A. Groesbeck, deceased. W. S. Hammond, vice-president in charge of sales, was elected a director of the company.

Bound Brook (N. J.) Oil-Less Bearing Company announces the appointment of A. K. Smith as production manager. Mr. Smith came to this company three years ago from the American Engine & Electric Company and this appointment has been made in recognition of his faithful and valuable services.

W. F. Cutler, who has just returned from service with the troops at the Mexican border, will resume his work as vice-president of the Southern Wheel Company with offices in the McCormick Building, Chicago, instead of the Railway Exchange Building, St. Louis. In addition to his duties for the Southern Wheel Company, Mr. Cutler has been appointed assistant to the vice-president of the American Brake Shoe & Foundry Company, with headquarters at Chicago.

Moulton Engineering Corporation, Consulting Engineers, New York, N. Y., in association with the Electron Chemical Company, announces the opening of a New York office in the Woolworth building. The office will be under the direction of Horace W. Flashman, who for a number of years has been associated with the Westinghouse Electric & Manufacturing Company. The corporation is prepared to render prompt and efficient service in general, civil, mechanical, chemical and power engineering, and in addition offers the co-operation of a trained corps of experts for the development of special processes and apparatus in connection with any of the industrial arts.

A. W. K. Billings has returned from Barcelona, Spain, where he has been for the past five years as manager of construction, managing director and vice-president of the Ebro Irrigation & Power Company, Ltd., and allied interests, in charge of extensive hydroelectric construction and other work. More than 110,000 hp. has already been developed, one interesting feature being the construction, under very unusual conditions, of the largest dam in Europe. Previous to his work in Spain and elsewhere for the Pearson interests, Mr. Billings spent two years in Pittsburgh and ten years in Cuba, principally on electric railway and power plant construction, and two years in New York as engineering manager of the J. G. White & Company, Inc. He has opened an office as consulting engineer at 115 Broadway, and will devote considerable attention to work in Europe and in Latin America.

Holden & White, Chicago, Ill., general sales agents for the Joliet Railway Supply Company, announce that they have received orders from the following companies for Perry anti-friction side bearings and Hartman self-centering center plates: Des Moines City Railway, Chicago & West Towns Railway, Buffalo & Lake Erie Traction Company, Lehigh Valley Transit Company, Southern Texas Traction Company, McGuire-Cummings Manufacturing Company, Fort Wayne & Northern Indiana Traction Company, Chicago, South Bend & Northern Indiana Railway, Gary & Interurban Railroad, Baldwin Locomotive Works, Cleveland, Painesville & Eastern Railroad, Union Traction Company of Indiana, New York, West Chester & Boston Railway, St. Louis Car Company (for the Michigan Railways), Lowell & Fitchburg Street Railway, Mason City & Clear Lake Railroad, York Railways Company, and Cleveland & Eastern Traction Company.

ADVERTISING LITERATURE

Roth Brothers & Company, Chicago, Ill., has issued an illustrated bulletin describing direct-current motors and generators. The motors are shown in various industrial applications suitable for shop work.

Ohmer Fare Register Company, Dayton, Ohio, is distributing a booklet on "The Ohmer Way" of properly collecting and accounting for fares. The maintenance of these fare registers is described and sample reports from different types of Ohmer fare registers are shown.

Vanadium Alloys Steel Company, Pittsburgh, Pa., is distributing a folder descriptive of "Vasco-Marvel," a semi-high-speed steel. This folder contains considerable information regarding the treatment of this metal, together with the high speed steel standard classifications of extras adopted July 22, 1915.

General Electric Company, Schenectady, N. Y., has issued bulletin No. 46104-A describing a new type of demand meter. It is used in connection with a watt-hour meter, and consists of a demand-registering element and a timing element which record graphically the energy consumption during a definite time interval.

Portland Cement Association, 111 West Washington Street, Chicago, Ill., has issued a bulletin entitled "Concreting in Cold Weather." This describes and illustrates methods suitable for protecting the work under extreme conditions. A simple set of rules suitable for posting on the job is also ready for distribution.

Barrett Company, New York, N. Y., is distributing a booklet on the "Long Life for Wood at Low Cost," which explains where and how to use Carbosota grade 1 liquid creosote oil. Numerous illustrations are given showing decay in wooden structures due to improper or non-treatment, and in addition plans and specifications of a simple and inexpensive wood-treating plant are given. The open-tank treatment and other treatments are illustrated and described.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued leaflet 3953 on its HLD control, which is a combination of lightweight HL and PK, with all parts assembled in a single box for convenience in installation. This control was designed especially for use on the low-floor car of the fully inclosed type without platforms, which is being widely adopted for city and suburban service. This control has been developed with a capacity for handling quadruple equipment of 40 hp. motors, or the largest size ordinarily employed for low-floor cars.

New Publications

Awakening of Business. By Edward N. Hurley. Doubleday, Page & Company, New York, N. Y. 240 pages. Cloth, $2, net.

This book, presenting the individual views of the former chairman of the Federal Trade Commission, is designed to assist business men in bettering business conditions and working out sound co-operative methods, and to bring about a closer harmony between business and government. In Mr. Hurley's opinion, business men must not be narrow-minded, and government must be a counselor rather than a policeman. As a whole, the book is a timely warning of what is demanded by the new era of business upon which the world seems to be entering.

Mathematics for the Practical Man. By George Howe, M. E. D. Van Nostrand Company, New York, N. Y. 153 pages. Cloth, $1.25, net.

Written especially for practical self-instruction, this book affords a simple and quick explanation of the elements of algebra, geometry, trigonometry, logarithms, co-ordinate geometry and calculus. It is a most valuable compendium of the general phases of mathematics which are so necessary for the understanding of technical works, and which are so easily forgotten even by the engineer when not constantly used. The book "begins at the beginning," and presents fundamentals in a straightforward yet scientific manner, without useless discursions into theory. As the title indicates, therefore, it satisfies a big want of the practical man.

Electric Railway Journal

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Consolidation of STREET RAILWAY JOURNAL AND ELECTRIC RAILWAY REVIEW

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STRAWS SHOW THE DIRECTION OF THE WIND

The news pages of this paper are a pretty good barometer of the activity along different lines of electric railway endeavor. A striking feature of these columns recently, especially in the department of Traffic and Transportation, has been the number of important steps taken by railway companies to improve public relations. In several cases it has been the appointment of publicity agents, in others it has been the advertising for suggestions for needed improvements in the service, in still others the establishment of employees' magazines, or of schools for instructing the men in courtesy, or of other means for allaying public criticism. More and more is there in evidence a recognition of the necessity of better public relations, not as a means for obtaining privileges from the public as compensation, but because such a policy is part of the duty of every public utility. The increasing amount of attention being given to this subject is naturally gratifying to us as we have been consistent advocates of such a policy for years.

THE FUNDAMENTAL MOTIVE

The fundamental motive of all successful campaigns toward better public relations must be that the public is entitled to good service and fair treatment. It may be that the company considers that it is not receiving fair treatment from the public, but this is no excuse for a neglect of its own duties. Let the company carry out its part of its written and unwritten bargain to supply good service, and if the public recognizes that this is being done we believe that it will reciprocate with fair treatment to the utility. Concrete instances often point a more easily understood moral than general statements, and several such are mentioned in this week's issue. One of these relates to the city of Buffalo. Here a complaint by a certain newspaper that good service was not being given was answered by a general request to the public for any constructive criticism on the transportation furnished. The daily paper could do nothing but make its criticism concrete, and submitted twelve ways in which it suggested improvements might be made. The company promptly issued a statement entitled "How We Meet Criticism." In this it acknowledged that some of the points were well founded and explained the physical conditions which had prevented their earlier correction. It then agreed to make such changes as were immediately practicable, promised to introduce such others as could be carried out and, where actual opportunities for improvement were beyond the power of the company, presented an explanation of the reasons therefor. Such a policy cannot but have its effect. Still other instances of the way in which proper publicity can make the position of a public utility clear to the public are given in a contributed article, also in this issue.

USELESS REPAIRS TO STREET PAVING

A trip over a large city property recently disclosed the surprising fact that repairs to pavement were being made at points where battered rail joints had destroyed the surface but that no attention was being paid to the joints causing the trouble. Presumably no recognition had been given to the hopelessness of maintaining pavement adjacent to loose joints, whose working in a vertical plane is generally sufficient to displace even the most rugged class of surfacing for streets. The cause of such bad spots ought to be obvious enough, especially when it is not uncommon to find that, when all of the joints in a stretch of track are weak, the paving surface is badly broken up at regular intervals along the rail, each disturbed area having a radius of a few feet that centers exactly on the joint. The remedy ought to be equally obvious—the repair of the joint. Certainly it cannot be that repairs to paving at such points are anything more than patch work, and patch work of such a kind invariably means wasted money. Since the primary cause of the trouble has not been removed, there can be no doubt that the repaired pavement will promptly return to its original condition and that the expense for labor devoted to relaying the pavement, even though this might be small in amount, could far better have been applied to the renewal of a few of the worst track joints.

LOCOMOTIVES IN SUBURBAN SERVICE

The probable purchase, in the near future, of locomotives rather than multiple-unit equipments for the New Haven's suburban service brings up a phase of the locomotive versus motor car problem that is worth consideration. This is that when locomotives are used to haul suburban trains during the morning and evening peaks, the same motive power may be used for through trains of passenger coaches during the rest of the day (provided the schedule may be so arranged as to permit it) and thus the service factor of the costly electrical equipment may be raised. Normally, of course, the motor car is considered preferable for this class of traffic because it is not unusual for suburban equipments to make only one round trip each day owing to the limited duration of the peak loads, and because a train of multiple-unit cars costs less than a train of trailers with a locomotive, first cost being, of course, of greatest importance where such low service factors exist. If, however, sufficient freight, or through-passenger traffic that cannot be handled in motor cars, exists during the hours when suburban traffic is at a standstill, it is easily conceivable that the locomotive may furnish the more economical, or less expensive, type of motive power.

SOMETHING TO TALK ABOUT The paper on the training of motormen for the Chicago Elevated System, published elsewhere in this issue, sets forth the long and thorough training to which all motormen on the system are subject before being intrusted with the responsibility of train operation. This training is an extremely important matter on the elevated roads in view of the disastrous results which might follow dependence on careless or irresponsible motormen. The splendid record of the Chicago system reflects the wisdom of this long-term student period, and the company's patrons must feel a sense of safety in the knowledge that such competency is required of the men in whose hands their lives are daily intrusted. But do the people know about it? Isn't such activity on the part of the transportation companies to safeguard their passengers—not only in Chicago but elsewhere—of popular interest? The fact is that it is just this sort of thing that makes a good "human interest" story, although it is only one of the many phases of electric railway operation in which the companies profit by a better knowledge of their work on the part of the public.

SPECIFICATIONS FOR MEN!

Why not? Time and again experience has shown that when material not up to specifications is used in a machine or structure costly accidents happen, early replacements are required, and in the end the final cost is as great or greater and the final results less satisfactory than as if good material had been used in the first place. The organization of men necessary to operate a railway can be likened to a machine, and from the very nature of its structure and functions it is necessarily a delicate machine. For satisfactory operation the parts must be well balanced and carefully co-ordinated. The better the individual units which compose the machine conform to a properly specified ideal, the better will be their team work or co-ordination. The elimination of the physically unfit, the mentally incapacitated and the careless reduces the number of accidents and makes for better service. The elimination of the faultfinder, the grumbler and the restless type of individual decreases the strike hazards and promotes good public relations.

A purchaser usually feels that he can afford to pay higher prices for material that conforms to specifications than for material which does not. The same thing might indeed apply to labor. A part of the savings in accident claims, strike losses and replacement costs might well be paid out as wages to competent employees who, by good and faithful service, have made such savings possible. The higher rates of pay thus afforded would attract a higher and more stable class of men to the service.

We recognize that the caliber of a man cannot be calipered, and that when labor is as scarce as it is at present employment officials are glad to be able to find material of any kind. It seems to us, however, that the present tendency, as evidenced by a number of papers and discussions at recent association meetings, to exercise great care in the selection of recruits for the operating department is a far step in advance of the older and more haphazard methods.

HANDLING WAY MATERIALS

That way engineers are alive to the possibilities of saving money by judicious use of mechanical devices is clear enough from the number and tone of the articles which this paper has been printing recently. The fact is that there is no more prolific topic of conversation around the way department of any railway. In this issue there are four articles on the subject, all prepared with the idea of showing for the benefit of the industry in general the results which have been obtained by applying certain definite and fundamental principles on particular properties.

We hope that before this discussion is closed there will be at the disposal of managers and way engineers all of the information which they will need in answering these questions while solving problems in materials handling or planning to perform a given special or routine operation: (1) What is the general practice on a job of this sort? (2) What apparatus is available for performing it? (3) Among available devices which is most economical for this case? (4) What savings are to be obtained by using the best available equipment? (5) Shall we purchase this equipment or build it or some makeshift for it ourselves?

So much for the particular job, but there is another angle from which the subject can be viewed, as suggested by such questions as these: (1) What devices are way departments finding useful generally? (2) Could any of these be used profitably on this property with our present organization? (3) If not, could the organization be modified so as to permit the use of such devices? and so on.

Some of the principles referred to in the first paragraph stick out prominently in this discussion. First, there is no question as to the expensiveness of human labor considered merely as mechanical work. Man-energy costs at least $2 per kilowatt-hour. But some investment in machinery is necessary if cheaper energy is to be utilized, and the economy of this machinery depends upon the number of hours per year during which it can be used. Power plant engineers use the term "load factor" in a somewhat analogous connection. The term "service factor," as used on the preceding page in a discussion on rolling stock is quite applicable to machines used by the way department. The second principle, then, is that machines must be kept busy if they are to be profitable. There are, of course, some instances when the possible savings are so great that a machine will pay for itself in a short time. In the run of cases, however, sensational savings are not to be expected and the general principles of economics apply.

The securing of high service factor implies adaptability. Hence we note the popularity of the mobile crane car or derrick car which can perform many functions, as is splendidly illustrated elsewhere in this issue. There is here, then, a third principle, namely, that in general the equipment which is most adaptable to a wide variety of uses is likely to prove most economical.

The present discussion started with the storage yard. It could not be confined there, and has broadened out to include labor-saving devices in all divisions of the way department. While the way department engineers "have the floor" they had better bring out all the available data. Later they must yield their place to other departments that are of equal importance in the operation of electric railways.

PREVENTING RAILWAY STRIKES

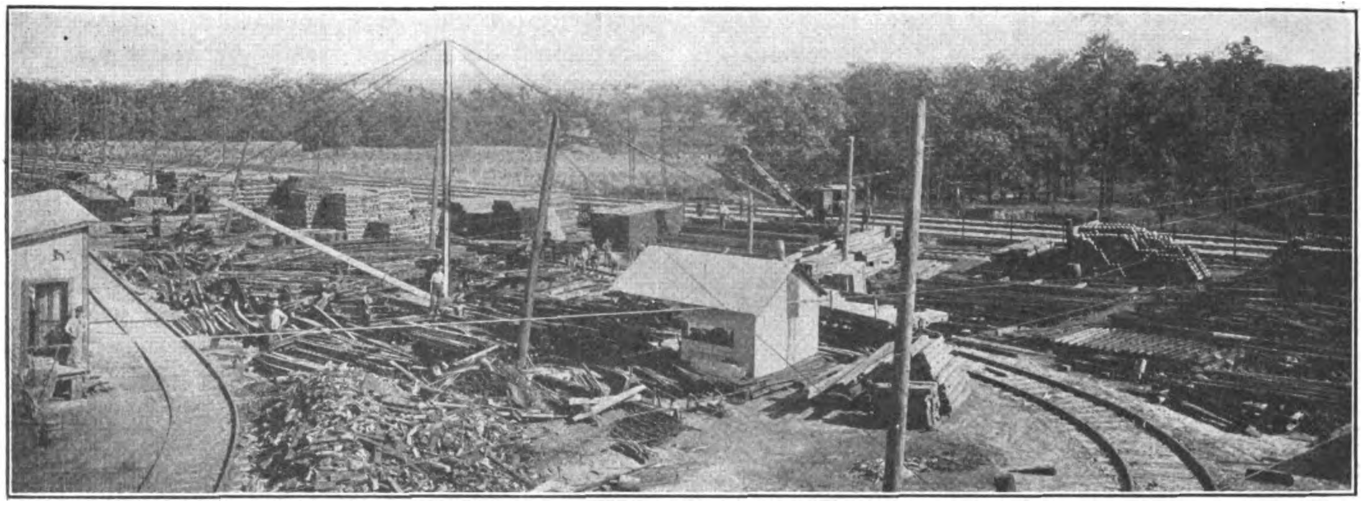
Out of the maze of discussion during recent months on the subject of strike prevention, there has at last appeared from an official source a proposition that should be carefully studied by electric railway officials. We refer to the labor plan, published in full on another page, of the Public Service Commission for the First District of New York. Confronted last August and September with the threat of an unparalleled tie-up of electric railway transportation in the metropolitan district, this commission has made a careful investigation into what it deems the defects of the existing public service law, and has now presented for constructive criticism a tentative statement of its recommendation for legislation.

The advantages which the commission itself asserts for the plan would seem to indicate that an earnest endeavor was made to consider the rights of all parties concerned—the railways, the employees and the public. For example, fair wages and working conditions would be determined by the companies and their employees, under the eye of an impartial and non-voting appointee of the commission, or by a wage board organized by the commission and composed half and half of company and employee representatives, or else by the commission itself. All questions of wage-fixing, etc., not settled by mutual consent would be referred to a wage board, but it is provided that applications to such a body should not be made until reasonable opportunity had been given for the companies and employees to reach a mutual understanding, the wage board or the commission being the judge of the reasonableness of such opportunity. The final approval of the settlement by any method would rest with the commission. The plan thus seems to allow a wide and fair latitude for the private settling of industrial disputes upon the basis of facts instead of coercion, commission supervision being reserved only to protect the rights of the public. In connection with wage increases it is supposed, of course, that the right of railway owners to a fair return would be preserved.

The questions of unionization and discipline appear to have been handled in a liberal manner. In the first instance it is provided that ten or more employees might form an association or union or branch of any such existing body, and that all such organizations (together with the unorganized men) would share in the membership of the wage board in a reasonably proportionate way, provided every six months they filed with the commission their rules, officer and membership lists, and a written consent to abide by all awards. The plan thus allows freedom of organization and collective bargaining, but it assures to any internal brotherhood and all unorganized employees an appropriate participation in wage and other adjustments. In regard to discipline, this would primarily be left, as it should be, in the hands of the employer, deserved redress, however, being obtainable on review from the wage board or commission.

From the point of view of the public, the most important part of the plan is the limitation on the right to strike. Not only does the idea of enlistment for public service find approval in the provision for an express or implied contract of service for one year (terminable upon thirty days' notice), but the right of the public to uninterrupted service is further recognized by the prohibition of strikes pending wage and other determinations. After the findings the employees would supposedly be bound both by their contracts of service and by their registered pledge of obedience to any award made. How to enforce such provisions is, of course, the crux of the problem. The plan provides that any violation would be classed as a misdemeanor punishable by a fine. Before such a punitive clause is adopted, however, the commission would do well to ascertain, if possible, how effective it would be in the case of the average employee. Might it not be desirable that all union organizations parties to such an agreement be required to file a bond, so that a better hold would be had on them for damages?

It is evident that the proposal in its fundamentals is designed to assert the public right only with a full recognition of the public obligation to both employers and employees. According to newspaper reports, however, the leaders of organized labor have been quick to denounce the plan, a move not unexpected in view of their general opposition to any system that will take from them their chief duty of fomenting strikes. Yet we believe that the public is becoming more deeply conscious of its right to continuous service, and the plan of the New York commission is a fair sign of the times. For this reason it behooves electric railways not only in New York City but throughout the country to examine the proposal carefully for unjust or impracticable provisions. The approaching hearings in New York will be on a subject of vital importance to the future prosperity of the industry, and every possible constructive and helpful suggestion is needed.



HANDLING WAY MATERIALS—STORAGE YARD CONGESTION DUE TO FAULTY USE OF EQUIPMENT

Handling Way Materials Economically

Practice of Kansas City Railways and General Principles Involved in Cutting Cost of Handling and Transferring Material

By A. E. HARVEY
Engineer Maintenance of Way, Kansas City (Mo.) Railways

THE cutting of cost in the handling of material in storage yards is an exceedingly important process. There are many points involved which, unless carefully considered, may be overlooked by the uninitiated in an attempt to cover them, and may cause unnecessary expense.

The most important point to consider in this connection is the keeping of the equipment which may be required for the work in proper balance with the amount of work to be performed. In other words, large sums of money should not be expended in the purchase of expensive machinery which may be used only a few days in the year. The interest, depreciation and upkeep of machinery of this kind will frequently amount to much more than the increased cost of handling material by other methods. Again, in the purchasing of machinery for purposes of this kind the selection of equipment that can be used for only one particular purpose and in one location should be avoided as far as possible. Machinery standing idle earns nothing, and the most economical results will be obtained in using machines that can be utilized for many purposes and kept constantly at work.

MATERIAL SHOULD BE HANDLED AS LITTLE AS POSSIBLE

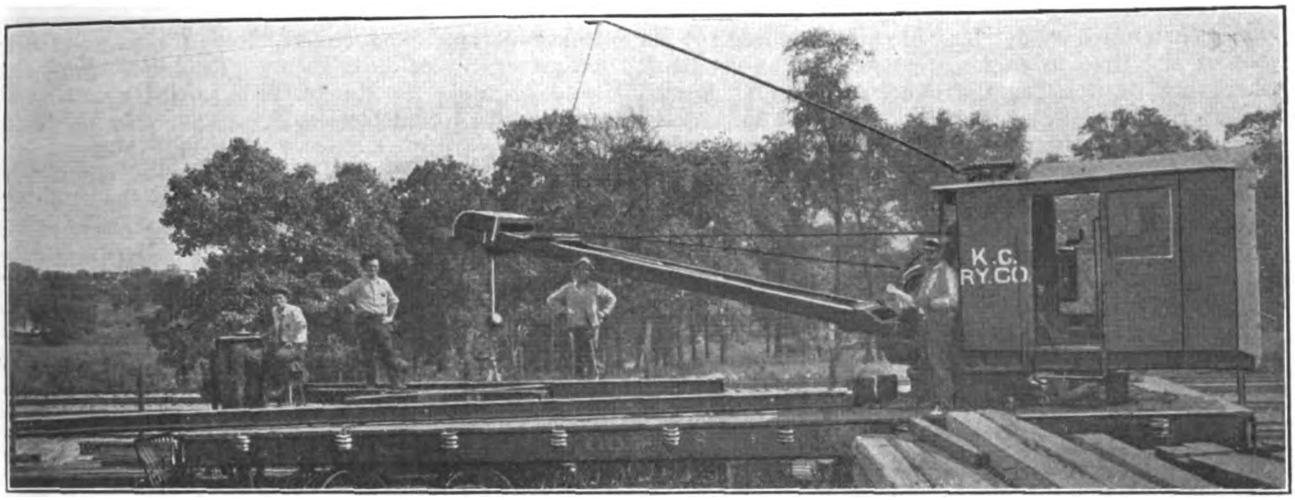
A third point, which in the estimation of the writer is more important than either of the others, and one which more than any other is overlooked by engineers, is the proper timing of the receipt of material for storage. The most economical proposition is that all material received should be transferred directly from the steam railroad cars to the cars of the traction company and delivered immediately upon the work, thus avoiding one handling.

The way in which this principle is applied in the handling of cement on the Kansas City properties is as follows: We used last year a total of 440,800 sacks of cement. Our storage capacity would take care of two cars only. The cement house was kept as full as practicable, but all orders were filled directly from cars. Seldom was cement transferred from the cars to the house, except where there was a small portion of a carload left at the end of a day's work which could be transferred to the house and thus release the car. Occasionally cement was taken from the house to fill the orders when for any cause there was a delay of a day or two in the receipt of material, but it was found that the amount of storage provided was ample to cover such emergencies. The net gain during the year on account of not having to rehandle this material would amount to about $2,000.

CO-OPERATION WITH THE PURCHASING DEPARTMENT IS NECESSARY

This ideal condition, of course, cannot be made to apply in all cases, but should be approached as closely as possible. This proposition necessitates close co-operation with the purchasing department. It involves the ordering of material at the proper time, governed largely by expected or possible delivery, and the careful following of such orders to see that the material is delivered at a certain time, so as to correspond to the progress of the construction work. Of course, the statement may be made that in these days it is impossible to specify and govern the actual delivery of material of almost any kind, on account of manufacturing and transportation conditions. But one can do the other thing, namely, regulate the work to conform to the delivery. Under this method, the store yard should act only as a reservoir to carry a sufficient amount of any commodity to tide over a break in the regular delivery, and take up a portion of the deliveries which may be made in advance of the requirements. The distinct advantage of this method of handling the store yard is not only in the saving of extra handling of the material made necessary by storage, but the space required for storage is decreased and money invested in stores is materially decreased.

In track work these matters, of course, can apply most generally to such materials as granite block, brick, stone, sand, drain tile and cement. Upon metals, where the deliveries are dependent upon manufacturing conditions at the mills, such as the time at which certain



HANDLING WAY MATERIALS—USEFUL DERRICK CAR ON KANSAS CITY RAILWAYS

rollings of rail are to be made, the time cannot be so closely gaged, and it is frequently necessary to store a considerable amount of materials of that class.

DIRECT TRANSFER OF MATERIALS TO JOB ECONOMICAL

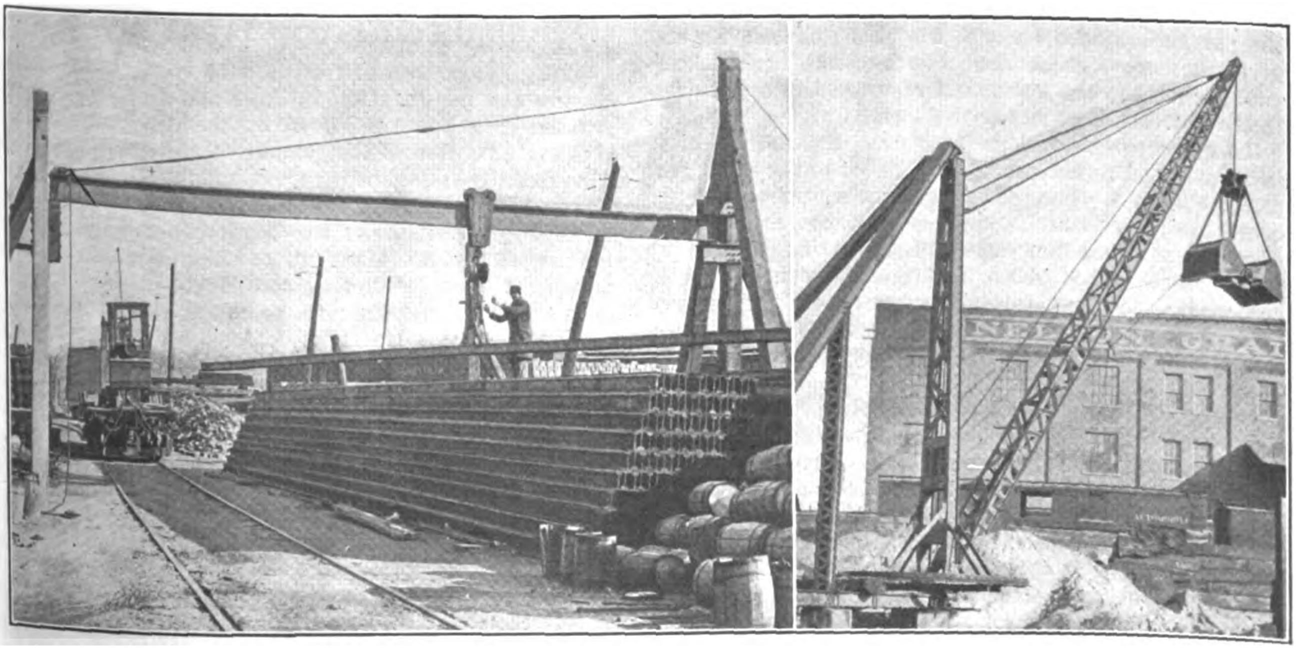
In Kansas City this policy in the handling of supplies has been followed partly through necessity on account of the limited storage capacity of the yards. There has been no material delay to any work on account of failure to receive standard material, however, and it is safe to say that in the past year 80 per cent of the granite block received has been handled and delivered by direct transfer to motor cars. More than 90 per cent of the brick received, 95 per cent of the cement, 80 per cent to 90 per cent of the sand, and all of the crushed stone have been handled in this way.

Taking these items in the volume used in Kansas City last year, the saving to the company in direct handling of this material amounted to $3,200 or more. The total actual saving may have been double this amount, for when material is unloaded from railway cars for storage more than the passing of material a short distance from car to car is involved. It must be moved back a sufficient distance from the track to provide proper storage space, and this distance has again to be covered in the reloading.

When one stops to consider that this procedure results in a saving of one handling of all material involved in the construction and reconstruction of 10 to 15 miles of track in this case, he must concede that it is a more important item in cutting down materials-handling costs than the difference in the cost of handling a comparatively small amount of material with expensive machinery instead of manual labor. The management of a store yard by such methods and under such conditions does not mean that it is not economical to use modern equipment in handling material wherever practicable. Care should, however, be taken in the selection of such equipment, and first cost, operating and maintenance cost should be carefully balanced with the requirements.

MACHINERY CAN BE USED EFFECTIVELY ALSO

The machine best adapted to the handling of material in the store yard of a street railway, and one which can be put to the most universal use, in some form of hoisting machine that can be used in any part of the yard. Such a machine is perfectly practicable, as the heaviest material which it must handle will be a large piece of special work, or crossings, or perhaps a clam shell for use with stone or sand. It has distinct advantages over fixed derricks on account of its large radius of action. It should be so constructed that it may be utilized upon the main tracks, in which case it will earn far more



HANDLING WAY MATERIALS—SIMPLE DEVICE FOR THE RAIL PILE; STIFF-LEG DERRICK MADE FROM BRIDGE MEMBERS money than any fixed derrick. It can be utilized 100 per cent of the time in earning money for the company, whereas a derrick for the handling of sand, special work, or miscellaneous material of any kind can be utilized only for the material that lies within the radius of its arm, and will probably stand idle more than 95 per cent of the time.

An accompanying illustration shows a derrick car that has given excellent service in Kansas City. The days and nights are not long enough for this machine to accomplish all the work that might be assigned to it. It can be used anywhere in the yard, in transferring and unloading material in the streets, in placing special work, in picking up scrap or other material, in picking up and transporting machines and in doing a thousand other things incidental to track construction.

If, however, there is sufficient work to keep a machine busy continually within the confines of the store yard, it would be better to use a slightly different type of machine, such as a locomotive crane. A machine like this, of less speed, carrying a longer boom and having a greater lifting capacity, is usable in any part of the yard. At the same time it has all the advantages that could be derived from a boom derrick.

AN EFFECTIVE DEVICE FOR HANDLING RAIL

The handling of rail in the yard is in itself a difficult and expensive job, ordinarily involving the use of a large gang of men. In this work the sliding, pulling and dropping of rail, with the tendency to kink or break it, should be guarded against. Rail cannot safely and to advantage be handled with a boom derrick or with a crane car. It is a material that ordinarily must be received and stored at such time as it can be secured, and a permanent arrangement for handling it is frequently justified.

Another illustration is shown of an arrangement that has proved exceedingly satisfactory and economical. It consists only of two uprights, 12 in. x 12 in., properly braced, between which an I-beam 50 ft. long is suspended. The beam is fastened with a pin at one end and it is hinged at the other. When in use the I-beam is swung across the rail pile and the car of rail and is secured by means of the pin. Rail is lifted from the car and transferred to the pile, or vice versa, by the use of a differential pulley. This can be done with a force of not more than five men. The cost of transferring is 7.3 cents per ton, as compared with the 53 cents per ton which was the cost when the rail was dragged out of the car and skidded up onto the pile. This device also gives us a more economical pile as the rail can be carried higher and the amount of required storage room is thus reduced.

This form of derrick is, of course, fixed and limited in its use and is necessarily in service but a small percentage of the time. It is, however, an economical device on account of its low first cost and the low cost of maintenance and operation. Its use is justified where a derrick costing $5,000 or $6,000, for the same service and where used only for such service, would be barred on account of its first cost and the cost of maintenance.

THE USE OF DERRICKS

In the handling of such commodities as sand and stone there is undoubtedly a vast advantage in the use of machinery. For this purpose we have made good use of a stiff-leg derrick built up of second-hand bridge members and operated by means of an electric hoist. A photograph of this is shown herewith. The volume of material handled at this place in sand and stone amply justifies the use of a fixed piece of equipment. A large storage capacity is supplied within the radius of a boom, but a very large percentage of material may at the same time be transferred directly from the railroad cars to the motor cars of the company. The cost of transferring sand or stone or its reloading with this equipment amounts to 1 cent per cubic yard for sand and 2 cents per cubic yard for stone.

This is an illustration of the proper use of equipment of this kind where the material handled is of but one or two classes. An improper use of equipment of this kind is shown at the top of page 150. Here the derrick is seen in use in handling and storing special work and material of that class. The congestion that occurs within the range of this boom is conspicuous in this picture. Frequently material that might be required first was stored at the bottom of the pile. This derrick has been replaced with a crane car, which has resulted in more methodical and economical storage.

SUMMARY AND CONCLUSIONS

While the use of modern equipment is beyond question economical, it should be reiterated that a grave mistake may be made in the selection of equipment and the investment of large sums which will be earning for the company but a very small percentage of their time. These, as has been pointed out, are expensive in maintenance and depreciation, and in some cases in operation, requiring special men with them at all times. Therefore, in the selection of equipment for use in the yards, that which can be most generally used should be chosen. A machine may be a mechanical wonder, but if usable only from 5 per cent to 10 per cent of the time it is economical only during that time.

The arrangement of tracks, also has a very important bearing on cutting costs in material yards. In fact, the trackage arrangement is the basis upon which the entire scheme for handling material should be built. It should be such that, whatever facilities there are for the handling of material, the material can be transferred directly from the original cargo to the motor cars, or into storage, without the necessity for moving cars. The arrangement should also provide for convenient handling from storage to the motor cars. A first-class track arrangement, laid out in accordance with this principle, supplemented by the use of a locomotive crane, and with such fixed hoisting arrangements or derricks as conditions may justify, will provide a yard where material may be handled and transferred in the most economical manner.

Bulletin on Troop Transportation

The gigantic task of transporting troops to the border during the mobilization in June and July, 1916, is described in a bulletin issued by the American Railway Association, New York, which contains extracts from the recently published report of the Quartermaster-General of the United States Army. To move the first 100,000 guardsmen to the border, the railroads furnished 350 trains made up of 4900 locomotives, 3000 passenger cars, 2000 stock cars, 1300 box cars, 800 flat cars and 400 baggage cars, rolling stock which, if combined in a single train, would have been 90 miles long. Troops were carried from 608 to 2916 miles, distances greater than on any European war front, with only one accident, and that a slight one.

The National Safety Council announces that the proceedings of the Detroit meeting, which were covered in abstract in the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 28, 1916, page 930, are ready for distribution. Members can secure at a nominal cost reprints of the electric railway and other section proceedings for distribution to employees.

Practical Results in Publicity Campaigns

Circumventing the Misguided or Unscrupulous "Reformer"

By CHARLES T. HEASLIP
New York City

[*Two instances are cited. In one the president of a gas company received his inspiration from the readiness with which his story was understood by a friend at his club. The same statement of facts was given to the public and the municipal ownership advocate lost his following. In the second the representatives of the company "took the stump" to neutralize the oratory of a political spellbinder.*]

TWO years ago a sincere but radical reformer attacked the validity of the franchise of a company that supplied gas for light, heat and power purposes in a small but rapidly growing city. The attack came at a time especially inopportune for the company, as its officials were trying to borrow money for extension work absolutely necessary to keep the company's service abreast of the growth of the community. With the franchise under fire, however, it was impossible to negotiate the needed loan, as capital always fights shy of a company whose franchise rights are being questioned.

Now the franchise had been granted in the old days, before it was the custom to limit such grants to a period of twenty or thirty years, and the company claimed that it was perpetual. But in order to halt the attack being made upon it, and incidentally to avoid expensive litigation, the company offered to waive that claim if the city would grant it a new and more modern franchise. Accompanying this offer the company submitted a draft of the kind of franchise which it would accept. This provided for generous discounts to consumers and for a revision of rates at five-year intervals.

Under ordinary circumstances the city officials would probably have accepted the company's offer, as the suggested franchise was both fair and modern. Moreover, the company itself had an exceptionally clean record in the community. But its reformer foe was rapidly blackening its reputation. As stated before, the reformer was sincere, but a radical; and illustrating that the first essential to being a radical is to eliminate all sense of fairness from one's system, he had raised the cry of "Stop Thief!" against the company.

Originally this cry had been based upon his assumption that the company's old franchise was invalid and that it was stealing rights from the city for which it should pay, but even the company's offer to buy a new franchise did not induce him to withdraw his charges. The proposed measure, despite its discount provisions, did not provide for rates which, in his estimation, were sufficiently low. Therefore, the company was still a thief; the city should take over the plant and conduct its own gas business. As a result of this tirade the city officials, most of whom were up for re-election, were afraid to consider the company's offer until they could see just how seriously the public was going to regard the reformer's charges.

While the matter was hanging fire the president of the gas company chanced to meet the president of the local Civic League one afternoon at the Elks' Club. Conversation turned to the subject of the franchise, and within five minutes the Civic League man was listening with interest to the public utility official's presentation of the company's case. When the latter had finished the Civic League man said to him:

"Harry, I wish you'd attend the next meeting of our league and tell the members the same story you've told me. We've been thinking of endorsing the municipal ownership movement started by Harris (the reformer), but before any vote is taken on the matter I want the league thoroughly to understand the company's position I think it would make a difference."

The president of the gas company accepted the invitation and on his way home that afternoon he did some hard thinking. He was a conservative man, and not in the habit of discussing company affairs outside his office; but his chat with the head of the Civic League had been an eye-opener. The Civic League executive was a social economist with ideas on the rights of corporations that differed materially from those of the corporation man. Yet they had been able to meet amicably in a club and discuss the gas company's case with perfect intellectual honesty and without calling each other names. On the one hand one man did not think that the other represented predatory wealth, and on the other hand the second man did not think that his companion represented predatory poverty. Moreover, at the conclusion of their chat the Civic League man had shown that he was not only interested in the public utility man's view on the rights of the gas company, but that he stood ready to respect them.

As the president of the gas company pondered this fact it suddenly dawned upon him that he had been able to accomplish what he had, not because men are more logical, tolerant or amiable in a club than on the street, but because he had trusted his one-man audience and had stated the gas company's case implicitly. And in doing so, he had made it vital, human and interesting.

"If I can do that with one man," he soliloquized, "I ought to be able to do it with the whole town."

Following out this line of reasoning, he engaged the services of a publicity man and told him the same story that had won for him the interest and respect of the head of the Civic League.

"Your job," he said to the publicity man, "is to get that story before the public in the most effective way possible. Do it any way that's legitimate, but get it over!"

In carrying out these instructions the publicity man gave his employer a job by arranging for him a personal speech-making campaign which took him before every club and civic organization in the town. Arrangements were made with the newspapers to give this "stumping tour" all the free advertising that its legitimate news features warranted.

Then, with public attention focused on the gas company, the publicity man supplemented the speech-making campaign of the president with a series of "Franchise Talks" in the advertising columns of the newspapers. These occupied a quarter page in each paper daily, and told the company's story in chapter form, each chapter setting forth an individual phase of the company's case. They were written in a frank, friendly, man-to-man tone and the public read them, partly because they were interesting and visualized the efforts which the company was making to earn a square deal from the community, and partly because the public is always ready to hear the other side of any controversy.

As this combination campaign progressed the city officials began to receive resolutions from the clubs and organizations before which the president had spoken, urging them to accept the company's offer. Gradually these communications increased in volume. Then came letters from individual citizens to the newspapers, supporting the company's cause, letters from business men urging the people to show by their attitude on the franchise that they belonged to a fair-minded community and were not prejudiced against capital merely because it was being attacked by a politician or reformer.

To make a long story short, the municipal ownership agitation, which had in the beginning threatened to become a real menace to the company, gradually subsided; the city officials accepted the offer made by the company, and within a period of two months the new franchise was granted.

Two significant deductions can be drawn from this incident. One is that if a public utility official will trust the public as he trusts an individual friend or acquaintance, it will not take him long to secure a degree of understanding between his corporation and the public that is of tremendous value in times of stress. The other is that it is possible for a corporation with an honest theory of its own existence and conduct to secure fair play from the public even when a reformer or politician has raised the cry of "Stop, Thief!" against it—providing, of course, that the company uses intelligent methods.

The question may now arise as to what constitutes "intelligent methods" for a company that is under fire. Does it always mean advertising plus speechmaking on the part of the company's chief executive, or are there other ways of convincing the public that a corporation is not necessarily a thief just because a reformer or politician sees fit to tack that appellation to it?

It has been the experience of the writer, that the answers to the above questions depend largely upon local conditions. One fact which stands out, however, is that the company under fire should waste no time in getting its case before the public.

This has been proved again and again during the past few years by the failure of eleventh-hour truth-telling campaigns on behalf of companies that have failed to see the handwriting on the wall and have let the politicians get ahead of them.

For the companies whose officials are ever on the alert, however, the task of checking an anti-corporation agitation that threatens to become dangerous is not impossible, pessimists to the contrary. A frank "public-be-told" campaign in the newspapers can nearly always be made to produce effective results, but its benefits may be materially increased if the company officials will supplement their "straight story" in the press by every other legitimate method of gaining an audience that opportunity affords.

A POLITICIAN DISCOMFITED

I remember, for instance, a campaign which I helped a Southern lighting company to conduct against a typical political demagogue who was a candidate for a place on the board of aldermen on an anti-corporation platform. He had selected the lighting company as a stepping stone to office because its franchise expired the following year and the new one proposed was to be the subject of a referendum vote of the people.

Under the proposed franchise the domestic service charge for electricity was to remain at the same figure which the company was charging—10 cents per kilowatt-hour. In a river town fifty miles away, where coal was cheaper and the expense of manufacturing current was less, the domestic service charge was only six cents per kilowatt-hour. Seizing this chance to draw the "deadly parallel," the politician made his campaign upon pledges of "six-cent electricity for our town."

When I arrived on the ground the company had already started to present its case to the public through a series of newspaper advertisements, but a preliminary canvass taken in the mill district of the town showed that the company's political foe was making more converts there than the company. An investigation by one of the company officials and myself showed that, like a number of anti-corporation candidates, he was a great believer in the doctrine of rant. He ranted about the tyranny of capital in general and that of the local lighting company in particular. He almost wept when he told his "dear brothers" how they were paying four cents a kilowatt-hour more for their electricity than was "justified," and how that four cents, which "multiplied itself into thousands of dollars during the course of the year," all went into the "capacious pockets of the greedy lighting corporation."

At that stage of his speech an illuminating incident occurred. One of his listeners, a quiet-looking man with shrewd gray eyes, made so bold as to heckle him.

"Look here, friend," he said, "what do you mean by this here kilowatt thing?"

The question startled the candidate and he sparred for time.

"So you want to know what a kilowatt is, eh?"

"I surely do," affirmed the heckler.

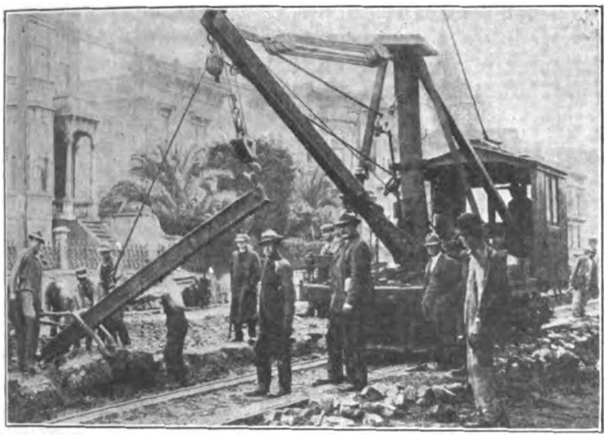
An inspiration came to the candidate and he grabbed it.

"A kilowatt, my friend," he said, "Hell—a kilowatt is something this robber company is charging you 10 cents for when you ought to be getting it for 6!"

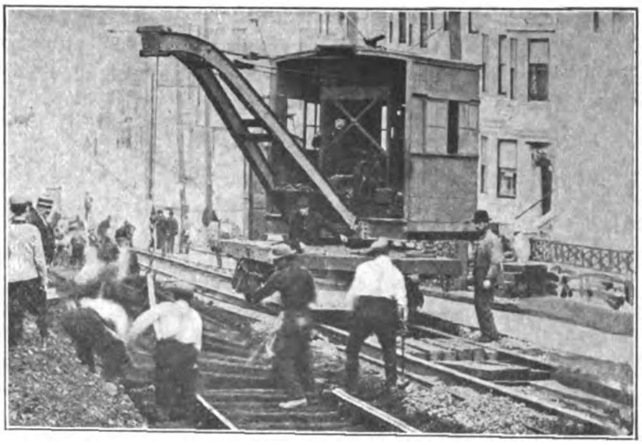
The answer raised a laugh and the speaker took advantage of it to hurry on to less dangerous ground. But a brief survey of the audience tended to indicate that he had underestimated the mentality of some of his listeners. Both the company official and myself were convinced that there was an excellent chance for the company to discount the vituperative arguments of the candidate with a personal campaign of honest explanation and reasoning. The upshot was that we decided to follow the candidate with a corps of clever and good-humored spellbinders who would speak at each place after him and riddle his accusations against the company with simple and specific explanations of the points raised against it.

In carrying out this idea we kept one man with our political foeman on all of his speechmaking tours. This man reported the candidate's speeches to our spellbinders and also gave them valuable information as to the character of the audiences which they would face in each place and the probable questions which would be hurled at them. The company induced two of its best solicitors, who were popular chaps and good "mixers," to take the stump for the franchise, and they succeeded in securing fair play for the company all through the candidate's district. As a result, the company not only secured a favorable vote on the measure, but its political opponent was defeated on the very platform on which he had expected to win.

Electric street-car service was inaugurated in Matanzas and Cardenas, Cuba, on Dec. 17. The *Diario de la Marina* says that much enthusiasm greeted the opening of the new car service, and it is believed that the tramways will assist greatly in the development of these cities.



MATERIALS HANDLING IN SAN FRANCISCO—DERRICK CAR PULLING UP OLD CABLE CONSTRUCTION



MATERIALS HANDLING IN SAN FRANCISCO—FIVE-TON CRANE CAR REMOVING OLD TRACK

How Construction Materials Are Stored and Handled in San Francisco

By B. P. LEGARE

Chief Engineer Maintenance of Way & Construction United Railroads

IN San Francisco we are using methods of handling and storing materials which have been developed gradually to fit the requirements of our particular problems. In looking over the article by R. C. Cram in the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 23, 1916, I find therein but little in common with our system. However, the very fact that two railway systems can rarely utilize identical methods creates a need for a variety of information on this subject, and is in itself a good reason for compiling and publishing the methods of various companies in solving their material-handling problems.

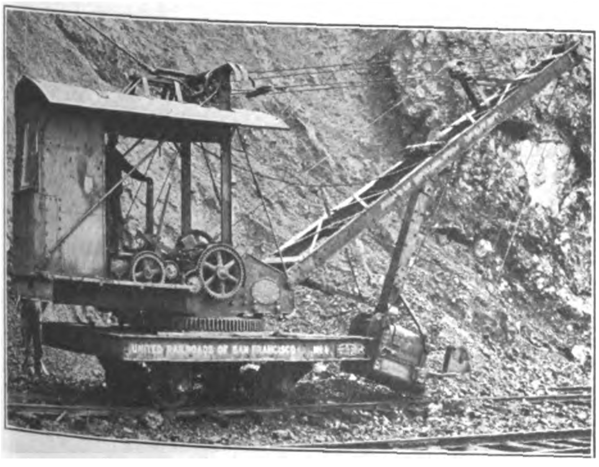
The United Railroads employs no one yard where materials are delivered for general distribution. This is partly because materials are received by rail and by water at different points of delivery, and partly because considerable area for storage purposes is not available near the center of the system. However, by adhering to a system for handling each class of material it has been found possible economically to conduct the accounting and checking of materials at the same time that their convenient distribution is facilitated by the use of the several storage points.

The Brannan Street yard is located near the center of the United Railroads' system, and although of small area it is found well suited for storing materials which are most frequently called for, as well as all materials which are delivered to the company from barges, this location being only a short haul from the waterfront.

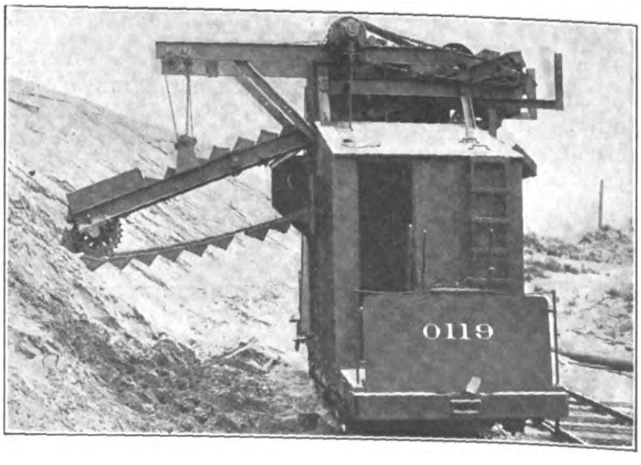
In this yard are stored all old and new ties, cement, brakeshoes, barreled asphalt, trolley wire, track bolts, crossarms, pole fittings, etc. A single track traverses the yard along the center line, whence materials are delivered to cement shed or storehouse on either side. The rear portion of the yard is reserved for storing ties.

This company finds it most economical to use no mechanical equipment in handling ties, although common labor costs as much as $2.50 per nine-hour day. The ties are loaded from boats directly onto flat cars by slings, and in the Brannan Street yard the ties are passed by hand, one at a time, from the cars to men on the ground. They are then stood up on end in the tie storage space. Thus it is never necessary to take the time to pile them up, and when taking them from storage a man never has to bend over to pick up a tie.

Old ties when brought into this yard from reconstruction work are dumped on the opposite side of the track from the new ties. The old ties are later sorted, and those considered unfit for further use are sawed



MATERIALS HANDLING IN SAN FRANCISCO—ELECTRIC CRANE CONVERTED FOR USE AS SHOVEL



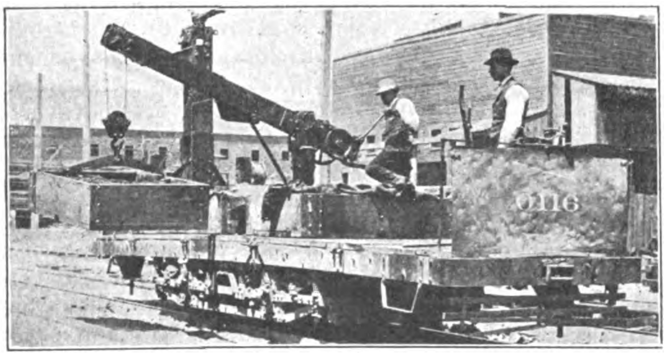
MATERIALS HANDLING IN SAN FRANCISCO—SAND ELEVATOR READY TO LOAD FROM BANK into three lengths for firewood. For this purpose a motor-driven circular saw is used, this being mounted on a small wheeled truck with an arrangement for taking power from the trolley.

SHOPS AND MAIN STORAGE YARD

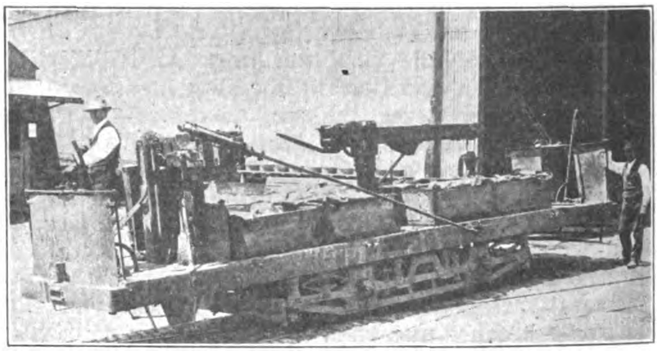
About 5 miles from the center of the system the company maintains the Geneva Street yards, where the shops are located and where the larger and heavier equipment and materials are usually stored. This yard is provided with about 2 miles of track and ample space for storing special work, paving brick, rails and all materials received by rail. A spur track from the Southern Pacific Railroad makes connection with the company's lines at this point. The company's 5-ton crane car, derrick car, electric shovel and similar rolling stock are usually kept at this yard.

The 5-ton crane is used in place of derricks in the yard to handle all steel materials. This crane is mounted on a truck equipped with the usual motors so that it can be dispatched to any part of the system. It unloads and piles special work, scrap iron and whatever heavy material there may be to be handled in the yards, and is also employed on construction work for laying track. It is mounted on a turntable with full circular swing, the motors operating the crane being separate from those for propelling the car.

The derrick was built up in the company's shops, and is used chiefly in construction and reconstruction work. It operates the plow in breaking up the surface preparatory to excavation, operates a ¾-ton hammer for breaking up pavement, or tears up cable road construction when cable lines are being replaced with tracks for electric operation. The company also has another derrick built entirely of steel, which it was decided would be more useful if equipped with a bucket such as is used on steam shovels. Accordingly, a ¾-yd. bucket was attached by means of a hinged joint, and this arrangement has been found very useful.



MATERIALS HANDLING IN SAN FRANCISCO—ASPHALT CAR UNLOADING BOXES



MATERIALS HANDLING IN SAN FRANCISCO—ASPHALT CAR COMING FROM MIXING PLANT

Three portable rock crushers are used for breaking up the concrete removed from old cable railway conduits. Although the company operates its own rock-crushing plant, and can deliver crushed rock for ballast very economically, it has been found cheaper to employ these small rock crushers in reconstructing cable lines because their use eliminates the necessity for hauling away the concrete removed from the old track. The crushed concrete is piled along the line from which it was taken, and as soon as the new track is down it is used for ballast.

HANDLING SAND AND CRUSHED ROCK

Excellent sand is secured for maintenance and construction without going off the company's right of way. The sand conveyor shown in an accompanying illustration can load a 16-cu. yd. car in ten minutes from the sand dunes through which the line has been located in some of the outlying districts. This sand is rather fine, but has proved excellent material for making concrete. It is also suitable for use on the cars and for mixing bituminous compounds, although for this purpose it is passed through sand dryers and thence to sand bins. An unlimited sand supply is so conveniently located that there is practically no necessity for storage facilities.

The company maintains a rock-crushing and screening plant on the outskirts of San Francisco at Daly City, where a maximum of about 200 cu. yd. per day can be produced. Owing to an arrangement with private companies for the securing of emergency supplies of crushed rock, no storage is provided for this material, and it has been found convenient to deliver from the crusher direct to the construction job, even when the requirements of the work call for as much as 300 cu. yd. of crushed rock per day.

The Daly City plant is also the depot for storing second-hand paving block. This is in order economically to dispose of broken pavers and the spalls which result from cleaning by hand the paving blocks removed from the street. All of this waste material is dumped into the crusher.

HANDLING ASPHALT IN BOXES

The company also maintains a blacksmith shop and general storehouse at Market and Valencia Streets, and here is located the asphalt mixing plant. A feature of handling asphalt is the specially designed car containers which are used for delivering the mix. A special car has been built with a hinged post on which the trolley is supported. The post can thus be easily lowered so that the car can pass under the asphalt mixers and receive its load by gravity. While the trolley pole is down power is supplied by 60 ft. of "fishline" connecting the trolley pole directly with the contactor board. This length of line is sufficient to allow the loaded car to move out to a point where the trolley is again put in service.

Before going under the asphalt bunkers four shallow boxes with a capacity of about 1 cu. yd. each are placed on the car by means of a derrick boom from a centrally located mast. When desirable two tiers, or eight boxes per load, are handled. After asphalt has been discharged into these boxes each unit is covered with a layer of carpet and the car proceeds to the paving job. Upon its arrival there the boxes are unloaded by the derrick boom and the boxes are kept covered up to the time that the material is actually required. It has been found possible to deliver asphalt 20 miles by this method and still have the material sufficiently hot upon its arrival at the job.

Illinois Association Holds Annual Meeting

At Chicago the Illinois Electric Railway Association Discussed Papers on the Economy of Raising Voltages for Railway Motors, the Training of Motormen and the Design of Interurban Headlights, Together with Reports from Standing Committees

A WELL attended meeting of the Illinois Electric Railway Association at the La Salle Hotel, Chicago, Jan. 19, was occupied with papers of interest particularly to operating men. One of them dealt with the effect of low voltage on railway motors and pointed out the economies to be realized from raising the trolley voltage even by small amounts. Another was devoted to the subject of headlights, and in a third the training of motormen was discussed. The meeting was ably presided over by Second Vice-President D. E. Parsons, general manager East St. Louis & Suburban Railway, in the absence of President J. R. Blackhall and First Vice-President C. F. Handshy.

COMMITTEE REPORTS

Reports of the several standing committees were called for after the association had listened to the reading of the minutes of the two preceding meetings by the secretary, W. V. Griffin, secretary and treasurer Chicago Elevated Railways. John Leisenring, Illinois Traction System, chairman of the engineering committee, stated that this committee had confined its activities during the early part of the year principally to consideration of the Bureau of Standards' electrical safety code. Later it was learned that the Illinois Public Utilities Commission was not going to adopt the Bureau's code, but instead was to draw up one of its own, and the attention of the committee had then been directed to the proposed code for the state. A joint committee from the Illinois Electric Railway Association and the Illinois Electrical Association had held two meetings and had filed with the commission a statement covering the objectionable points of the proposed code. The rules have since been greatly modified, being issued finally in December but dated in October. This committee also had held several meetings with the engineering staff of the commission, and as the result of the general co-operation it was believed that the final draft of the code was fair and workable.

Since a meeting in May at which all the telephone, telegraph, electric light and railway interests were represented and which was the last public hearing on the code, the commission put in a rule requiring the numbering and lettering of all poles in cities and municipalities and every fifth pole on transmission and other rural lines. This, of course, would entail a considerable burden on a great majority of the companies, and the joint committee of the two associations asked for a hearing, which was held Jan. 17. As a result of this, Mr. Leisenring felt that the commission would surely find it necessary to eliminate this rule or modify it to a large extent. It was brought out at this hearing that the additional expense to which the commission would be subject in the work of locating certain poles which might be involved in any action, if they were not all numbered and lettered, would amount to perhaps $200 a year. The Chicago Telephone Company offered to donate this amount to the commission, since if the rule were enforced it would cost this company $100,000 for the first numbering and lettering and $20,000 a year to continue the practice.

W. B. Potter, Illinois Traction System, chairman of the traffic committee, recommended to the association that steps be taken to withdraw if possible the interchangeable mileage books which sell at $8.50 for $10 in mileage. It had not proved popular because several of the participating companies had individual mileage books which sold at a more attractive discount. This brought out the fact that some of the members were not at all in favor of discontinuing this association mileage book, and there was pointed out the need for the succeeding traffic committee to work out a new mileage book which could be sold with a uniform discount inducement on all properties. Mr. Potter also recommended that the companies adopt some uniform system of advertising, and laid emphasis on the importance of placing timetables in the official railway guide. He believed that the interurban companies were losing considerable business because of the fact that this guide was the place where passenger agents looked for information and, when a line was not listed there, looked no further.

F. E. Fisher, general superintendent Chicago, Ottawa & Peoria Railway, added to the report of the traffic committee the considerations which had been under way in regard to transportation of baggage by interurban lines. The Illinois Commission had proposed the carrying of baggage on the same basis as the steam roads, namely, 150 lb. free with every full fare and excess charge for weights over this amount. A hearing had been held before the commission at which it was clearly brought out that since the conditions of handling were so complicated and varied it seemed impossible to establish any uniform rule. As a result the commission apparently was holding the matter in abeyance.

TECHNICAL PAPERS

The rest of the morning session was devoted to the reading of two papers, one by K. W. Mackall, electrical engineer Ohio Brass Company, on "Headlights," and the other on "The Effect of Low Voltage on Railway Motors," by G. M. Woods, Westinghouse Electric & Manufacturing Company. The latter paper appears in this issue. The former was published in ELECTRIC RAILWAY JOURNAL for Dec. 2, 1916. In discussing Mr. Mackall's paper, W. McK. White of Holden & White told of several tests in which the results corroborated the statement in Mr. Mackall's paper that a yellow beam light will penetrate a fog to a greater distance than a white beam. This feature is particularly prominent when the light is used as a marker or harbor light. For this reason the Navy Department and rivers and harbors commissions have adopted the yellow beam projector quite generally. In answer to a question by the chairman as to using incandescent lamps in headlights, Mr. White remarked briefly that the Milwaukee Northern Railway had found this type of headlight equipment very satisfactory, this company having made use of the Watson car lighting regulators in connection with the headlight and car lighting on all its cars.

In the discussion on Mr. Woods' paper, Mr. Parsons told how his company had saved itself the expenditure of $120,000 for copper by increasing the trolley voltage on the system about 100 volts. He said that the equipment on his cars included GE-67 and GE-70 motors as well as Westinghouse No. 49 and No. 56 motors wound for 500-volt service. The manufacturers advised him against raising the voltage when he proposed this means of improving the conditions, but he decided the experiment was worth trying. During the first week twenty-five armatures were burned out and the second week fifteen armatures. These were thought to be old motors which were probably in bad condition anyway. Then it was soon found that some of these rewound motors were causing trouble, and so new armature winders were employed. The insulation was increased and the brush holders changed, and since then these same motors have caused no trouble, the service being greatly improved with the saving noted above.

ELECTION OF OFFICERS

During the luncheon which followed, the nominating committee made its report and the secretary was instructed to cast the ballot of the association for the following officers:

President, C. F. Handshy, assistant general manager Illinois Traction System, Springfield, Ill.

Vice-president, D. E. Parsons, general manager East St. Louis & Suburban Railway.

Second vice-president, Frank J. Baker, Middle West Utilities Company, Chicago.

Executive committee: Chairman, J. R. Blackhall, general manager Chicago & Joliet Electric Railway, Joliet, Ill.; F. E. Fisher, Britton I. Budd, E. C. Faber, H. E. Chubbuck and T. F. Grover.

Immediately after luncheon the members were treated to the motion picture film "King of the Rails," which in a most interesting manner familiarizes the observer with the construction details of the Chicago, Milwaukee & St. Paul electric locomotives as they were assembled in the Erie plant of the General Electric Company and with the significance of their operation over the 400-mile mountain division of this railway. This was followed by Mr. Feron's paper on training motormen, an abstract of which appears below.

President Blackhall was present at the afternoon session and was called upon for a few remarks. He reviewed briefly the work of the association during the year. In general, he laid stress upon the need for further operating economies, and made mention of some of the notable improvements in equipment, particularly the automatic substation.

Training of Motormen on the Chicago Elevated System

BY M. J. FERON

General Superintendent of Transportation
Chicago Elevated Railways

On many city and interurban lines new men are employed and enter the motormen's class direct. In many cases these men are unknown to the officials. After their references are looked up, they are sent out on the various lines or divisions with regular motormen to receive the necessary training to qualify them for work. These students, as a rule, are on probation for a period of ten days or two weeks or until their qualifications are approved or rejected. During this period they are expected to familiarize themselves with the equipment, rules and regulations of the company regarding speed, deportment, accidents, etc. They must also familiarize themselves with the city and village speed ordinances, police rules on the streets, proper stops and numerous other details.

It is my opinion that a student who is broken in in this manner leaves the probation period with a mind so confused with innumerable details that he is uncertain as to whether or not he is carrying out his orders properly. I feel quite certain that a man being trained for the position of motorman should receive time to absorb all of these instructions so that they cannot be forgotten or misinterpreted before he is considered competent to be sent out as a motorman.

On the Chicago Elevated Lines promotions are made from the train service to the motorman's class. In this way we get the benefit of the knowledge a man will acquire while working as a trainman for a year or more. All trainmen employed on the elevated lines are first hired as extra trainmen. These men are generally about twenty-four or twenty-five years of age and are not allowed to work on a train except under the supervision of a regular conductor. Before they are employed they must pass a rigid physical examination. If they are passed by the doctor they are then sent to the superintendent, and if he believes they have the necessary qualifications to make trainmen they are sent with a regular conductor to break in, and generally put in from a week or ten days with him learning the duties of a trainman. After having served as an extra trainman for a period of six or more months they are allowed to break in or become an extra conductor, and after one year's service with the company they are allowed to make written application to the superintendent to learn the duties of a motorman. These applications, however, must be approved by the dispatcher or the one in direct authority over the applicants before being sent to the superintendent. This is done so that the superintendent who issues the permit to a trainman to break in for motorman may have the benefit of the judgment of one who has had an opportunity to observe the habits, deportment and other qualifications of the applicant and knows whether or not he is naturally careless or careful.

When the superintendent receives the application he makes further investigation in regard to the man by consulting the trainmaster, the supervisors and the man's record card. If the superintendent then finds the man desirable and believes he possesses the necessary qualifications for a motorman, he will call him to the office and give him a good talk on the requirements of a motorman and what is expected of him. A regular motorman is then selected to break in the student, and the latter receives a card or permit to ride with that particular motorman at any time. As stated before, the student, in most cases, is an extra man, and while he is not engaged in the train service, instead of loafing around the train room, "killing" time, he spends his spare time with the motorman learning his new duties. All of our students break in on their own time, and it requires from four to six months and even longer before the motorman will return the permit indorsed with his O.K. to the superintendent.

The motorman who is breaking in the student realizes the responsibility he assumes in declaring his student competent to act as a motorman, especially so on account of a personal blank which the motorman must fill out and send to the superintendent when he passes his student. On this blank the motorman fully states any points of weakness he has observed in the student. This blank is kept strictly confidential between the motorman and the superintendent. With this information before him, the superintendent is able to dwell upon the weak points when the student comes in for examination. The supervisor, under the direction of the superintendent, also watches this man when on the road for this particular fault, and in that way, very often, we make a man strong where he was inclined to be weak.

By our method of training men for motormen, the student rides with one motorman only from the time he starts to receive instructions until he is thoroughly broken in. We also confine the student to one division and keep him on that division until he is thoroughly qualified for motorman. We think this is a considerable help, for when the student is operating only over one division he will have fewer details to remember and comprehend than he would if he had to learn the duties on several divisions at the same time. We find that once a man has been fully qualified to operate a motor on one division, it does not take him long to go on any other division and learn the details there, as all he is obliged to learn then is the operating rules for that particular division.

After a student is turned in as fully competent he is called before the superintendent and required to pass a rigid oral examination. If this examination proves satisfactory to the superintendent, he is then sent to the general superintendent, where he again attends a lecture in regard to speed on curves, operation of trains in fogs and other points of this kind. After the general superintendent has finished his instructions the man is considered a competent motorman and may be used as such when occasion requires. We feel that this method of training cannot fail to impress upon the student the responsibility of the position of a motorman, and as a rule we make him a careful, alert and competent man.

This method gives the company the benefit of the familiarity with the system and with the general operating conditions derived while the man is serving as a trainman, it provides a sufficient number of extra motormen to cover all emergencies, and gives the company an opportunity to judge of the man's responsibility before placing him in the motorman's position. We have 378 regular motormen and 224 extra motormen, and we have, on an average, sixty-five students passed as competent motormen each year.

Effect of Low Voltage on Railway Motors

BY G. M. WOODS

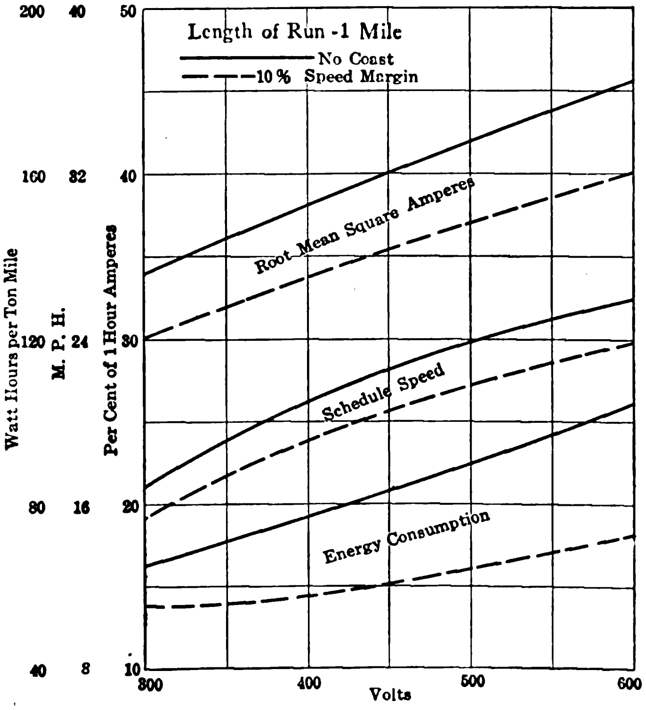
Westinghouse Electric & Manufacturing Company.

The speed of a series motor at any given current is directly proportional to the counter emf., that is, to the impressed voltage less the drop in the motor itself. The line voltage impressed on a railway equipment has, therefore, an important bearing on the performance of that equipment. Voltage affects schedules, energy consumption and motor heating. The effects of low voltage are for the most part undesirable and hence demand serious consideration.

The effect on schedule speed is the most readily observed feature of low voltage. It is well known that in a specific service a lower voltage involves a lower schedule speed, or a reduction in margin for making up lost time, or both. If service conditions are such that an equipment is able at a given voltage to make a certain length of run without coasting, it is found that an increase in voltage produces a comparatively small speed margin on very short runs, while on long runs for the same voltage increase, the speed margin may be relatively great. This indicates that for the reasonable maintenance of schedules, it is necessary on suburban and interurban lines to maintain better line voltage conditions or apply equipments with greater leeway in speed than would be necessary on a city line. Since the maintenance of good voltage is more difficult and expensive on interurban than on city lines, the alternative of higher speed equipment is usually adopted.

On every run, the time during which current is drawn by the motors is made up of two distinct parts, the period of notching up the controller and the period of running with the controller on full. The speed of the car before the controller is on the full-parallel position depends primarily on the motorman's rate of notching up the controller and is to a certain extent independent of the line voltage. The more marked effect of the change in voltage on the speed margin on longer runs is due to the fact that the motors are running at line voltage a larger part of the time.

The effect of voltage on the operation of car equipments will be examined from two standpoints; first, where the schedule can be adjusted to suit the voltage, and, second, where the schedule must be maintained irrespective of voltage. In the first case, the schedule, energy consumption at the car and the motor heating will vary in the same direction as the line voltage.



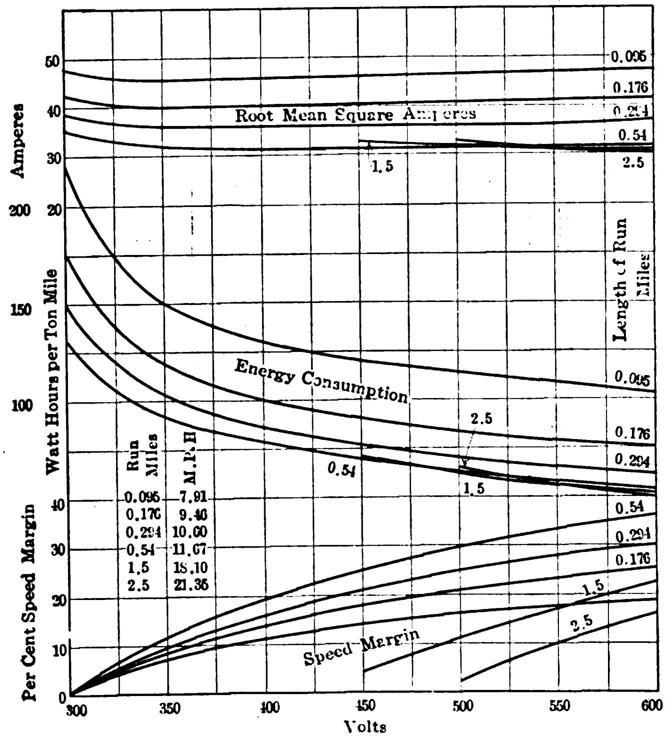
EFFECT OF VOLTAGE—FIG. 1—RELATION BETWEEN VOLTAGE, ENERGY CONSUMPTION AND SCHEDULE SPEED FOR GIVEN RUN

For example, under certain assumed conditions and with a typical railway equipment, it has been found that on the basis of constant speed margin, a reduction in generator voltage from 550 to 450 results in a reduction in schedule speed of 5 per cent for an average run of 1000 ft., and a reduction in schedule speed of 10 per cent for an average run of 1 mile. These percentages are approximately constant so long as the comparison is made on the basis of the same percentage of speed margin for both voltages.

Under these same conditions, the heating current is reduced about 9 per cent, both on a 1000-ft. run and on a 1-mile run, and this percentage varies but little for different speed margins so long as the comparison is made on the basis of a definite speed margin.

Energy consumption would be reduced 17 per cent at the car on a 1000-ft. run and 13 per cent at the car on a 1-mile run, the percentage being slightly greater when the comparison is based on runs without coasting than when based on runs with sufficient speed margin. This reduction in energy consumption at the car is due almost entirely to the reduction in schedule speed. If the lower voltage were assumed to be due to drop in trolley and track circuits, the energy consumption measured at the substation would actually increase by 1.3 per cent on the 1000-ft. run and 5.7 per cent on the 1-mile run.

As an example of the conditions prevailing where the schedule must be maintained, irrespective of voltage, it has been found that an increase in generator voltage from 450 to 550 results in a 28 per cent increase in percentage speed margin on a 1000-ft. run and a 32 per cent increase on a ½-mile run. The same increase in voltage results in a 12 per cent decrease in energy consumption at the car on a 1000-ft. run and a 20 per cent decrease at the car on a ½-mile run. If the assumed lower voltage is due to drop in the trolley and track circuit, then with the higher voltage at the car, the energy consumption measured at the substation decreases 28 per cent on the 1000-ft. run and 35 per cent on the ½-mile run. The energy consumption decreases as the voltage increases because with higher voltage the car gets up to speed more quickly, in making a given schedule more coast is obtained, and the brakes are applied at a lower speed. The lower energy consumption is the result of less loss in the heating of wheels and brake shoes.



EFFECT OF VOLTAGE—FIG. 2—RELATION OF VOLTAGE AND CURRENT CONSUMPTION OF MOTOR FOR VARIOUS LENGTHS OF RUN AND FIXED SCHEDULE

Under any given set of conditions there is one voltage giving a minimum heating current, which will increase if the voltage is either raised or lowered.

Fig. 1 shows the effect of voltage on schedule speeds, energy consumption, and heating current. It will be noted from these curves that as long as acceleration and braking rates, length of run, length of stop and speed margin remain constant, the schedule speed, energy consumption at the car and heating current vary in the same direction as the voltage.

Fig. 2 shows the variation in heating current, energy consumption and speed margin for several lengths of run from 0.1 mile to 2.5 miles, with voltages from 300 volts to 600 volts. For the four short runs, the schedule is such as can be made at 300 volts without coasting. The short runs are taken on that basis since the comparison can be made over the entire range of voltage chosen. On the two long runs, however, at higher voltages, the car makes the distance and coasts to a standstill in less time than required for the run without coast at 300 volts. In order to obtain a wider range of comparison, the schedule is taken as that which can be made at 600 volts when coasting to a standstill without any braking.

While the effect on speed margin and energy consumption is marked, the effect on heating current is comparatively slight. The ability of a car to maintain schedules under varying traffic conditions as measured by the speed margin, and the size of the power bill as measured by the energy consumption, are of primary importance to the operating man. The maintenance of an equipment is affected to a certain extent by the temperature rise obtained on the motors in their average service. It is doubtful, however, if the degree to which motor heating is increased by reasonably increased voltage will ever be reflected in any maintenance reports, provided running time is kept the same. With higher voltage, the coasting time is longer and brakes as a result are applied at a lower speed. This reduces the brake shoe and wheel wear and tends to counterbalance the theoretical increase in motor maintenance due to higher temperature.

With regard to motor heating, it is of interest to note that low voltage will often cause the overheating of a motor equipment on long grades. On account of the lower speed resulting from decreased voltage, the time on the grade may become sufficiently long to exceed the motor's thermal capacity, overheat the brushes or otherwise produce poor commutating conditions. This is particularly true of locomotives, since they will generally be more heavily overloaded on grades and operate at lower speeds than motor cars.

With extremely high resistance in trolley and track circuit it is sometimes possible actually to obtain a higher speed with the motors in series than with the motors in parallel. Assume as an example the following somewhat abnormal conditions: A single track section of road laid with 60-lb. rails and fed from one end by a single No. 0000 copper trolley wire. The total resistance per mile would be 0.305 ohm. If the substation voltage is 625 volts, and a car with quadruple motor equipment at the end of the line, 5 miles from the substation, is drawing 70 amp. per motor, the voltage at the car with motors in parallel is 198 volts. The voltage at the car with motors in series-parallel is 412 volts and the voltage per motor 206. The voltage per motor is, therefore, in the example chosen, 8 volts more with the motors in series-parallel, than with the motors in full parallel and the speed of the car would be 5 per cent higher. With any higher current per motor, the voltage drop would be greater and the difference in the voltage per motor with motors in series-parallel and with the motors in full parallel would increase as the current per motor increases.

REMEDIES FOR LOW VOLTAGE

One of the most easily remedied causes of low line voltage is low generator, or low-substation voltage. Generators and rotary converters are frequently operated below their rated voltages, whereas they can often be operated satisfactorily at 10 per cent above rated voltage. However, any contemplated increase in voltage should first be taken up with the manufacturer. Also, many roads are still operating cars equipped with motors that have been in service from ten to twenty years. Such motors are not only without commutating poles, but in many cases, the creepage distances and class of insulation are not suitable for any great voltage increase. However, by putting such motors in good shape and keeping them clean certain types may be made safe for voltages higher than that for which they were designed. For example, it is a matter of record that one road raised the substation voltage from 600 volts to 725 volts and by having taken the above precautions has successfully operated a large number of Westinghouse No. 56 non-commutating pole motors at the higher voltage.

Series running on grades reduces the voltage drop since the current drawn from the line is just half the current drawn when the motors are in parallel. The speed in series may not be higher than that in parallel as was the case in the abnormal example previously given, but due to decrease in drop, it will be considerably more than half the speed with the motors in parallel and other cars in the same section of the line will benefit from the higher average voltage.

On interurban lines the maximum current taken by any one car has a considerable effect on the voltage drop. By accelerating in series more rapidly than at the average rate required, and less rapidly in parallel, the peak current from the line and consequently the drop is kept below the value which would be obtained otherwise. This improves the average voltage at the cars.

Another condition which causes low voltage on interurban roads is the passing of two cars at a siding. Frequently one car stops and the other slows down to a low speed. Both cars then accelerate at once and an extremely low voltage results. If the motorman of the second car, having seen that the first car is in the siding, and the way is clear, would run by at a fairly high speed, and then coast, the first car could accelerate, while the second car is drawing little or no current, and the maximum drop would be greatly reduced. On account of track conditions, however, it is not always possible for the second car to run by at a high speed, but any effort to obtain co-operation between the motormen under circumstances of this kind will in a majority of instances be rewarded by better voltage conditions.

To Prevent Electric Railway Strikes

Public Service Commission for First District of New York Proposes Plan Involving Wage Boards to Settle Wage and Other Disputes—Hearings to Be Held on Proposed Bill

OSCAR S. STRAUS, chairman of the Public Service Commission for the First District of New York, on Jan. 22 made public the tentative details of a plan by which the commission hopes to avert future strikes on electric railways in New York City. The main features of the proposed scheme are the creation of wage boards to certify to the commission findings on all matters of wages and working conditions that cannot be privately adjusted, and the prohibition of strikes pending settlements, which cannot be turned down if approved by the commission.

Since the strikes in New York City last August and September, the commission has been considering the proposal of legislation to remedy the strike evil. As a result of its study of the weaknesses of the existing public service law, as well as of the needs of the companies, the employees and the public, it has now presented a tentative plan for public criticism. In about a week public hearings will be begun, after which a bill in final form will be drafted.

ADVANTAGES STATED BY COMMISSION

According to the announcement by the commission, it is believed that the proposed plan has the following advantages from the point of view of the railways: (a) Registration of trades unions and agreements; (b) decision of wage disputes or other grievances upon the basis of fact; (c) maintenance of discipline and efficiency; (d) reasonable permanency of the staff, and (e) avoidance of interruption in the service.

The plan, it is also believed, will promote for employees on electric railways: (a) Freedom to organize; (b) proportional representation on a wage board; (c) fair and reasonable wages and working conditions; (d) redress of legitimate grievances; (e) power to negotiate collectively with employers; (f) faithful enforcement of agreements and awards relating to wages and working conditions, and (g) security of employment.

On the other hand, the public will feel that there will be: (a) Fair consideration of wage increases and working conditions; (b) rate adjustments based thereon; (c) uninterrupted service; (d) better and more efficient service through reasonable security of tenure to employees and best possible working conditions; (e) avoidance of accidents due to inexperienced men, and (f) complete supervision of the service.

In short, it is said, the proposed plan will give the widest opportunity for private negotiation consistent with regard for the public interest, to promote amicable adjustment by agreement, to insure knowledge of conditions and fair determinations through the aid of wage boards, selected by the parties themselves, reserving that supervision necessary for the protection of the "third party." In addition, it will seek to secure power conspicuously absent from the present law, *i. e.*, the power to enforce agreements after they are made.

THE COMPLETE PROPOSAL

The full text of the tentative proposal is published below:

1. *Wages and Working Conditions:*

Street railroads shall provide for the payment of fair and reasonable wages and salaries to all employees engaged in the service and make provision for fair and reasonable working conditions in the performance of such service.

2. *Duty of Company to Provide Adequate Number of Employees:*

Every street railroad shall procure and have such employees in service, adequate in number, competent, and governed by rules and regulations as to discipline, competency, wages, hours of work, working conditions, employment, promotion, benefits, retirement upon pension or otherwise, discharge or termination of service or reinstatement, and contract or terms of employment, in accordance with the provisions hereof, as shall secure continuous, uninterrupted, safe and adequate transportation of persons or property and promote the security or convenience of employees, passengers, shippers or the public.

3. *Method of Determination:*

The determination of what shall constitute fair and reasonable wages and salaries and fair and reasonable working conditions shall be made either by:

a—Mutual agreement between employer and employee;

b—The wage board, constituted as hereinafter provided; or

c—The commission of the district having jurisdiction over the employer.

4. *Organization of Employees:*

Any ten or more employees engaged in any branch of any service over which the commission has jurisdiction may form an association or union, or branch or local of any existing association or union, and this shall thereupon have the right to represent its members in all negotiations with employers and to be heard in any proceeding in any manner relating to wages or working conditions affecting its members, upon making and filing semi-annually with the commission:

a—A certified copy of its articles of association, certificate of incorporation, by-laws, rules or governing regulations;

b—A full and true list of all its officers;

c—A full and true statement of the number of its members and the branches of the service in which they are employed; and

d—A consent in writing, signed by its duly authorized officers, to accept and abide by all decisions, awards and orders of the commission or the wage board, when approved by the commission.

5. *Negotiations and Agreements With Employers:*

Any association or union registered as provided may negotiate with any employer under the jurisdiction of the commission for the purpose of establishing a joint agreement upon wages and working conditions. Upon application by the employer or by such an association or union of employees, the commission shall designate an impartial person to preside over such negotiations, who shall have no power to decide or vote upon any of the subject matters involved in the negotiations.

6. *Wage Board, How Constituted:*

The commission shall make suitable rules and regulations for the establishment of a wage board or boards, whose duty it shall be to make investigation and to certify to the commission its findings upon all matters of wages and working conditions. Any association or union registered as provided shall be entitled to nominate upon such board such number of members as the commission shall determine is reasonably proportionate to the number of members in such association or union, with due regard to representation thereon of unorganized employees and taking into account the total number of all employees. The employer shall be entitled to nominate such additional number of representatives as shall be equal to the total number of representatives of employees.

If such nominations shall be approved by the commission, it shall organize and complete such wage board, shall provide suitable accommodations for its work and shall provide such clerical, statistical and other assistance as may be required for the due performance of its work. The members of such wage board shall receive such compensation for their services as shall be fixed by the commission, which shall be paid by the State Treasurer, as are the expenses of the commission for the Second District.

7. *Hearings and Determinations:*

All applications for the fixing of wages or working conditions not established by mutual agreement shall be referred to the wage board for hearings and findings. Upon its report, the commission shall make a determination which shall be binding upon all parties concerned.

If the wage board shall fail to agree, or if there be no wage board established, then such hearings shall be had before the commission and the commission shall make its determination upon its own findings.

Applications hereunder for a wage determination shall not be made until reasonable opportunity shall have been given both employer and employees to come to a mutual understanding. The wage board, or, in case of its failure to agree, or if there be no wage board established, then the commission shall determine what is such reasonable opportunity.

8. *Agreements, Rules and Schedules to Be Filed:*

Agreements, rules or schedules regulating wages or working conditions shall be filed with the commission and shall be subject in all respects to its approval.

9. *Grievances, Adjustment:*

The maintenance of discipline and efficiency shall rest with the employer. Any employee deeming himself aggrieved and unable to obtain redress from his employer may petition either the wage board or the commission for an investigation of his grievance. If, upon such investigation, either the wage board or the commission shall find that he is justly aggrieved, it shall make such order and award in the premises as it deems fair and reasonable and for the good of the service, including the reinstatement of a discharged employee, and, in such case, the award of back pay.

10. *Existing and Future Contracts:*

All existing contracts fixing wages or working conditions shall remain in full force and effect. No person regularly engaged in an operating service, including the furnishing of motive power for the service, as motorman, driver, conductor, engineer, trainman, brakeman, fireman, switchman, or otherwise, shall be engaged or retained in the service for an indefinite period, or upon a hiring at will. The parties shall fix a definite period or term of service; and in the absence of any other agreement, it shall be understood and implied that the period or term of service is for one year, and thereafter from year to year, unless terminated upon thirty days' notice.

11. *Limitations, Strikes and Lockouts:*

Pending negotiations, investigation and determination as herein provided, there shall be no lockout or strike on any service subject to the provisions hereof and no action shall be taken in group or concert or by agreement tending to interrupt the service; but nothing herein contained shall be construed to prevent employees from organizing to improve or better their conditions in accordance with the provisions hereof.

12. *Penalties:*

A violation of any of the provisions hereof by any person, firm or corporation, officer, agent or employee of an association or union, or by any employer, officer or agent, shall constitute a misdemeanor punishable by a fine of not less than $...... or more than $.......

13. *Application:*

These provisions shall apply to street railroads and to employees and organizations of employees engaged in the service of such street railroads.

Compulsory Health Insurance Opposed

Departmental Reports at Meeting of National Civic Federation Show Industrial Progress and Needs

VARIOUS questions, ranging from the status of female labor to military preparedness and international peace, occupied the attention of the National Civic Federation at its annual meeting in New York City on Jan. 22-23. The points of most direct interest to the electric railway industry were the discussion in opposition to compulsory health insurance and the departmental reports on welfare work, workmen's compensation legislation and conservation of human life in industry.

DEPARTMENTAL REPORTS

Disclosure of a source of enormous financial loss in American industry and announcement of the projection of a movement to prevent it by the organization of state committees of employers in the various industrial states were made in the report of Louis A. Coolidge, chairman of the welfare department. "Unnecessary 'hiring and firing' in factories, due largely to unintelligent methods of dealing with the workers, is responsible," said Mr. Coolidge, "for a national waste of many million dollars every year, and this loss can be prevented to a great extent by according better treatment to employees as regards wages, working conditions and other factors."

The calling of a national conference to discuss the necessity of state legislation throughout the United States requiring employers to compensate workers who contract occupational diseases was urged by August Belmont, chairman of the workmen's compensation department. The enactment of special statutes covering occupational diseases, apart from accidents, would render sickness insurance legislation unnecessary. Mr. Belmont said that thirty-two states and three territories now have laws compelling employers to compensate workmen or their dependents for loss through injuries or death by accident, arising out of or in the course of employment, and added that there is reason to believe that ultimately Congress will enact a federal workmen's compensation law covering employees engaged in interstate commerce, particularly railroad workers. Mr. Belmont deplored the lack of uniformity in the compensation laws of the various states, and he urged that compensation laws be made to apply universally to all employers and not be limited to alleged hazardous occupations. After citing the drawbacks incidental to the different forms of insurance, Mr. Belmont stated that the most acute problem relates to the cost of medical attention and the right of the employee to select his own physician. He emphasized the necessity for standards on medical attendance, insurance, employments covered by the law, and a method of computing awards.

Louis B. Schram, chairman of the industrial accident prevention department, advocated the enactment of uniform safety legislation in the industrial states, better enforcement of existing laws, larger state appropriations for factory inspection, increased numbers of inspectors, and the establishment of safety museums in the principal manufacturing centers by federal and state governments. Mr. Schram showed how the enforced payment of compensation and the reduced premiums offered by insurance companies to employers who eliminate hazardous conditions in their establishments have stimulated the interest of employers in accident prevention. "But nearly all safety legislation is inadequate," said Mr. Schram, "and in some states there is a distressing failure to enforce safety laws owing in part to the insufficiency of appropriations and the small number of inspectors allotted to the work."

COMPULSORY HEALTH INSURANCE CONDEMNED

One session of the National Civic Federation was almost entirely devoted to a discussion of the principle of compulsory health insurance, labor leaders and representatives of large corporations holding that the scheme was an undemocratic and inadvisable experiment. A resolution in opposition to the plan was referred to the executive council.

The objections of representatives of organized labor seemed to be based on the belief that compulsory health insurance could not be administered without class distinctions and control over wage earners, that labor is satisfied with its union benefit funds and that it desires no one to assume any guardianship over itself. Samuel Gompers, head of the American Federation of Labor, sent a paper stating that the only agency which gets at the causes of poverty is organized labor, for this aims at higher wages as measured by American standards of living. If these are secured, workmen can insure themselves.

Corporation representatives told of the successful health and death benefit systems now in use and asserted that the state should not interfere and use compulsory methods where private efforts have not failed. A. Parker Nevin, general counsel National Association of Manufacturers, was of the opinion that before compulsory health insurance is ever tried, compulsory agencies for the prevention of sickness should be adopted.

Among others who participated in the discussion were the following: Warren S. Stone, grand chief International Brotherhood of Locomotive Engineers; John Franklin Crowell, executive officer Chamber of Commerce; Frederick L. Hoffman, former president American Statistical Association; Charles G. DuBois, comptroller American Telephone Company; S. T. Simmonds, the Celluloid Company; M. W. Alexander, General Electric Company; W. D. Kelley, Consolidated Gas Company of New York; Hugh Frayne, American Federation of Labor; Peter J. Brady, Allied Printing Trades Council, and Timothy Healy, international president Stationary Firemen's Union.

Publications on Labor

Two recent publications by economic bodies present additional data in regard to one of the most important present-day problems—that of labor. The first, the January, 1917, issue of *The Annals* of the American Academy of Political and Social Science (Woodland Avenue and Thirty-sixth Street, Philadelphia), contains a large number of articles discussing various aspects of the situation, such as regulation of wages, hours and working conditions; public employment bureaus, collective bargaining, compulsory arbitration or investigation, voluntary arbitration and conciliation, and the fixing of wages by utility commissions. Single copies may be obtained for $1.

The other publication referred to above is the one on "Labor Disputes and Public Service Corporations," published by the Academy of Political Science (Columbia University, New York), as the January number of its *Proceedings*. This volume gives the full text of the various papers presented at the recent meetings of the academy, reported in the ELECTRIC RAILWAY JOURNAL of Nov. 25, 1916, page 1106. It may be secured in paper for $1 and in cloth for $2. Like the first mentioned publication, it is a real contribution to the studies of how to solve the labor problem in a democracy.

Treated Wood for Ties and Paving

At the Annual Meeting of the American Wood-Preservers' Association in New York Special Attention Was Devoted to Treated Wood-Block Paving—Elaborate Service Records Covering This Material and Also Steam-Railroad Ties Were Submitted

THE annual meeting of the American Wood-Preservers' Association, which was held in New York City, Jan. 23-25, 1917, with an attendance of more than 200 delegates, reflected the growing general interest in treated wood as a surface for street paving through the assignment of one complete session to the subject. At this time a committee stated that a joint specification for wood-block paving had been approved by committees from six different technical societies for presentation to their respective associations. In consequence, the committee submitted a copy of this specification for adoption as standard by the American Wood-Preservers' Association in a form substantially the same as that submitted as information at the last convention.

This committee's report included a statement disapproving of the use of sand fillers or sand cushions for such pavements. Sand fillers are not waterproof and permit water to reach the base of the blocks, causing trouble from expansion. If the blocks dry out and shrink, the sand settles down in the spaces between the blocks, creating the possibility of further trouble if the blocks later become wet and expand. Instead of sand, the committee recommended either coal-tar pitch or asphalt filler.

The committee expressed a favorable opinion in regard to the practice of laying blocks on a smoothly-finished concrete base, particularly when the blocks are either dipped in pitch immediately before laying or when the blocks are set in hot pitch swabbed upon the concrete base. A new method was also recommended whereby the smoothly-finished concrete base is coated with bituminous cement, this being allowed to get cold and hard before setting the blocks upon it. This substantially removes the objection of high cost applying to the use of hot cement and also removes the objection in regard to difficulty of replacing faulty blocks. Nevertheless, after a day or more of service the blocks adhere firmly to the base. In an appendix to this report there was given an account of tests upon wood-block paving to determine the relative strength of treated and untreated blocks. These tests showed no appreciable change in strength due to treatment, such minor differences as existed being considered to be due to changes in the internal structure.

The committee on preservatives, through a sub-committee, reported very favorably in regard to the use of water-gas tar and oil for treatment of paving blocks, and special comment was made in regard to the uniformly high waterproofing value of this preservative material. In addition, the sub-committee was unable to find instances of decay in any of the water-gas-tar treated blocks inspected by it, nor was any such decay reported from uninspected work, although a number of installations had been in service for more than eight years. The report was favorable also in regard to permanency of oil in the blocks, ease and completeness of penetration and freedom from bleeding when water-gas-tar and oil were used. In consequence, the committee recommended that refined water-gas tar be recognized as a suitable wood-block preservative and submitted specifications for a standard of the association for this class of material.

Another committee presented a detailed summary of replies to an inquiry regarding experience with wood-block paving in each of a number of cities. Detailed information was given on the oldest wood-block pavement installed in each city and on the best wood-block pavement regardless of age, as well as on pavements that had failed in service. Replies to the first section of the inquiry showed the maximum life of pavement to be in the vicinity of seventeen years, and where the life had exceeded this, the paving was reported in bad condition. Practically all of the oldest pavements were laid with long-leaf yellow pine, but some Norway pine and tamarack that had been laid since about 1908 appeared in the record.

The wood-block pavement reported by the different cities as being the most satisfactory up to Jan. 1, 1917, included installations up to an age of only about seven years. Practically all of this material was long-leaf yellow pine, but some tamarack and Norway pine laid in 1913, and subsequently, was included among the most satisfactory pavements by certain cities, improved methods of treatment and laying the blocks in the street undoubtedly being responsible for this condition.

The most interesting feature of the report was the section covering wood-block pavements that had been reported by different cities as failures, or as being the most unsatisfactory according to local experience. Reports were received from seventeen cities and included three cases of decay, four cases of excessive wear and four cases of heaving, the remainder being miscellaneous in character. Of the three cases of failure caused by decay, one was thirteen years old and was said to be chargeable to insufficient penetration of the oil into the sap wood. The two others were only four years old, and the reason for the rapid deterioration was not apparent, although it was presumably caused by insufficient treatment.

The four cases of failure because of excessive wear were all about ten years in age, the life of one pavement having been extended from seven to ten years by relaying with a number of new blocks. Of these four cases, one pavement was reported to have been laid with tamarack blocks, although a report from another source states that "all kinds of wood" were used. In two of the other failures due to wear the pavements were laid with black gum, and the fourth was reported to have been laid with Norway pine and tamarack.

The four cases of heaving or bulging that appear in the list of failures are charged to a neglect in providing for expansion, and to the use of pitch filler which becomes hard and incapable of compression in cold weather. In addition, reports on all four cases cite the probability that the blocks were insufficiently treated, being thus permitted to absorb an excessive amount of moisture and to expand greatly.

Of the four cases of failure classed as miscellaneous, two were caused by a washing out of the sand cushions under the blocks, both being reported to have been subject to the pumping action of street railway tracks on water that seeped under the blocks from alongside of the rail. In one of these cases some of the blocks are now resting upon the bare concrete foundation, while in other places the sand cushion is 6 in. thick. It is proposed to relay this pavement without a sand cushion, laying the blocks on ⅛ in. of asphalt supported by a mortar coating on the concrete base. This city reports that practically no repairs of wood-block paving have been needed on streets where car tracks do not exist.

Movement of street railway track is also reported as a cause of failure by another city, this movement producing leaks in the pavement surface and frost doing the rest. However, this trouble is found to occur only at cross-overs, and it is proposed to remedy the situation by using granite blocks at these points.

Of the remaining miscellaneous failures, one is due to excessive shrinkage during long dry seasons because of improper creosoting of the blocks and the use of sand filler. Another is due to sinking caused because the pavement was laid without any concrete foundation. The last instance of failure reported was chargeable to fire, the greater part of the city from which the failure was reported being destroyed in a conflagration. The committee, however, stated in its report that this could not be called an inherent defect in wood-block pavement because several instances were on record where wood-block pavements had passed through very destructive fires and were little injured. In one fire the heat was so great that overhead structural steel work was fused and fell upon a wood-block floor, but after the removal of the débris it was found that the blocks had charred only ⅛ in. to ¼ in. in depth under the direct action of the flame and from ¾ in. to 1 in. where they were touched by the fused steel. Subsequently the charred blocks were scraped and allowed to remain in service, while the blocks more deeply scarred by the hot steel were turned over and relaid. This burned floor involved perfectly normal charges for upkeep since that time.

SERVICE TESTS OF TIES

The report of a committee on service tests for ties and structural timber stated in its report that primary attention had been given to ties for steam railroads. A systematic collection of data of this character has been undertaken by the Forest Products Laboratory in co-operation with this committee and with the committee on wood preservation of the American Railway Engineering Association. The general plan is for the various steam railroads to submit annually a report showing results obtained on their test tracks, which are generally used since experience has shown that tie records can be kept more accurately by the use of short sections of experimental track than by trying to keep a record of all ties on one division or the whole system. These results are classified and tabulated systematically.

With a view to securing similar data for ties used in electric railway service in the same manner, this subject has been taken up by the committee with the American Electric Railway Association. Record forms for data have been submitted and it is expected that during the ensuing year exhaustive records will be available regarding the life of ties on electric railways. The committee considers that a compilation and analysis of such data, both for ties in interurban tracks and in track on paved and unpaved streets, has not as yet received proper attention.

In addition to the service test records, which covered records from thirty-three steam railroads, the report included a statement summarizing the results obtained during the last seven years on the Chicago, Burlington & Quincy Railroad with various kinds of treatment and various species of wood. This statement represented an average of the conditions existing on twenty divisions of the railway in the states of Wisconsin, Illinois, Missouri, Iowa, Nebraska, Colorado, South Dakota and Wyoming. With regard to the various kinds of wood, the feature of the statement is the fact that practically all untreated ties, with the exception of three species; namely, white oak, chestnut and cypress, reached the end of their life in seven years. All of the ties in question were laid in the years 1909-10, and in January, 1917, something like 90 per cent of all untreated ties had been removed, this figure reaching 100 per cent in several instances. The percentage of ties removed after the seven years' service in the case of the three above-mentioned exceptions, were respectively 10 per cent, 37 per cent and 51 per cent.

The influence of treatment upon the life of ties is displayed in the following table, which is a general summary of results regardless of species of wood.

Treatment	Total Ties Placed 1909-10	Total Ties Removed Up to 1917	Per cent removed Up to Jan., 1917
Creosote	3,264	16	0.5 per cent
Card Process.........	15,817	455	3 per cent
Burnett Process......	2,488	100	4 per cent
Untreated	3,270	2,626	80 per cent

The different treatments mentioned above include the straight creosote process, whereby creosote oil is forced into the treated wood under pressure until there is an absorption of from 5 lb. to 10 lb. of oil per cubic foot of timber. The Card process above-mentioned consists, in brief, in the use of a mixture containing about 80 per cent of zinc-chloride solution and 20 per cent of creosote, which is injected to an absorption amounting to about ½ lb. of dry zinc-chloride and 2 lb. or 3 lb. of creosote per cubic foot of timber. The Burnett process involves the use of zinc-chloride solution alone, this being applied under pressure after a preliminary vacuum until the wood refuses to absorb more, the absorption ranging between ¼ lb. and ½ lb. of dry zinc-chloride per cubic foot.

Interborough Complaint Invitation Appreciated

Posters Placed in Cars Soliciting Constructive Criticism Have Been Effective in Drawing Many Replies of a Reasonable Nature

The Interborough Rapid Transit Company and the New York Railways, New York, are receiving a large number of appreciative letters as a result of their recent appeal to the public for help in solving their transit problems, by means of posters placed in the windows of their subway, surface and elevated cars. The subway posters bear the following request:

> WE ASK YOUR HELP.
>
> Until new subway lines are opened rush-hour congestion is bound to be abnormal.
>
> The Interborough Rapid Transit Company is trying hard to meet the emergency. We are running every rush-hour train the tracks will hold.
>
> We ask helpful suggestions or criticisms.
>
> Write us at 165 Broadway. All letters will receive careful attention.
>
> THEODORE P. SHONTS,
> President Interborough Rapid Transit Company

The surface cards read:

> WE ASK YOUR HELP.
>
> Street congestion is the worst in the city's history. In our efforts to keep up good service we invite helpful suggestions, or criticisms.
>
> Write to 165 Broadway.
>
> Every letter will receive careful consideration.
>
> THEODORE P. SHONTS,
> President New York Railways Company

The elevated posters read:

> WE ASK YOUR HELP.
>
> The Interborough Rapid Transit Company seeks intelligent comment or criticism of its service.
>
> Letters sent to 165 Broadway will receive careful consideration and acknowledgment.
>
> THEODORE P. SHONTS,
> President Interborough Rapid Transit Company

On inquiry at the Interborough offices by a representative of this paper it was learned that out of about

200 letter replies received in answer to the invitation for criticisms, a gratifyingly small proportion of them were of an unreasonable and abusive nature, whereas about 75 per cent were worded with great consideration, most of the writers prefacing their criticisms by expressing their appreciation of the excellence of this railway's service and their realization of the enormous problems with which it has to contend. The great majority of these criticisms are specific in nature and relate to suggestions for improvements in particular localities or lines personally frequented by the writer, such as having trains skip certain stops during the rush hour in order to avoid congestion and accelerate schedules, or as to the condition of toilets in certain stations, etc. Although practically all the complaints are similar in kind to those which have been registered on previous occasions, they will all be reviewed carefully, in the light of the present altered conditions of transportation.

The investigation of the complaints has been placed in the hands of a special committee, composed of two representatives of the operating department, one representative of the legal department and one representative of the president's office. Each complaint will be referred to the man in most direct charge of the matter covered, and answered as soon as possible, the reply stating whether or not the complaint had been corrected, and if not, explaining frankly the company's inability to comply.

COMMUNICATION

Standards in Car Equipment

LACONIA CAR COMPANY
BOSTON, MASS., Jan. 20, 1917.

To the Editors:

The subject of standardization for electric-railway equipment is, I think, a particularly timely one, and is of vital interest at present to car builders and railways alike. Now that it has come to the front, I trust the agitation will be kept going to its logical conclusion—a conclusion that must come sooner or later, and the sooner the better. In this the support of the ELECTRIC RAILWAY JOURNAL is a powerful leverage which cannot be overestimated.

Standardizing electric-railway car bodies appears as a very broad problem to any one who has followed the evolution since electric cars have been in use, and, although electrically-operated cars are only thirty years old, and are still in their childhood, they have undergone wonderful improvement. Nevertheless, standardization to-day has acquired vital importance in railway equipment. Any one familiar with steam-railroad standards, and knowing what they have done for the steam railroads, cannot fail to appreciate the value of the whole movement.

At the present time, the standardization of motors and trucks for electric cars takes precedence over the standardization of car bodies, and electric-railway men are busy day and night on standards for all wearing parts used on their equipments. Where the wear is heaviest, standardization has, obviously, the most importance. Therefore, the motors, motor equipment, trucks and all truck appliances subject to wear are getting the first attention.

Standardization of electric-car bodies will require the general support of railway men before anything successful can be accomplished. To-day there are a dozen different general styles of car in use all over the country, and it is safe to say that each style of car has from five to ten varieties, when one considers their design, dimensions, platform construction, seating arrangement, system of fare collection, etc., so that the field for standardizing is large.

These variations in car-body design have been brought about largely by a belief in the influence of "local conditions" existing in the city and suburbs where the cars are operating, depending upon the layout of the city with reference to its streets, parks, depots, residential locations, business districts, factory locations and suburban territories, as well as municipal rules. As such conditions differ in different cities, railway managers order cars of a type that they think is best suited for their particular requirements. In the selection of the dimensions for the various types the conditions above mentioned are also allowed to dictate, and they interfere with the ready acceptance of standards, since the railway company that is fortunate enough to have wide streets and plenty of clearance will not submit to a narrow car or a short car that might affect unfavorably the questions of capacity and comfort of passengers.

However, variations of a few feet in length are not of vital consequence. The standardization of width and bolster centers would be, in reality, more important, for as soon as we change the width of the car we must design a new cross-section, and as soon as we change the bolster centers our underframe must be redesigned. Any arbitrary dimension for height, I believe, could be readily agreed upon, except where there is overhead interference involved by passing under very low bridges or other obstructions.

What everybody is working for is to get a car that is best adapted to their particular requirements. However, aside from the peculiar needs of certain railway companies, the aim, in general, is to produce a design that gives the lightest weight consistent with durability and the greatest carrying capacity consistent with the comfort and safety of the passengers, as well as a car that can be operated with a minimum number of accidents, is cheap to maintain, and is practical for fare collection. I am of the opinion to-day that the last comer is proving to be the best car from the standpoint of the public, the railway managements, and the railway commissioners. This is the low-mounted, center-entrance design, which, I believe, will be the first and best car to commence standardizing on, as well as the simplest.

As to the standardization of structural features, it may be said that we are progressing to the extent of getting nearer together in using the same class of structural material that is available from the standard sections manufactured by the rolling mills. But in addition, a few special sections that were carefully designed and agreed upon would greatly help the builders to make lighter, stronger and neater cars.

H. DENTON WHITE,
President.

In 1916 the Pennsylvania Railroad System carried 196,294,146 passengers—the greatest number in any year of its history—without losing the life of a single one of them in a train accident. The heaviest freight traffic ever transported by any railroad was moved at the same time that these passengers were being carried safely. The entire Pennsylvania Railroad System, taking into account every affiliated company either East or West of Pittsburgh, now has to its credit three complete successive calendar years in which no passenger has been killed as the result of a train accident on any portion of its lines.

ASSOCIATION NEWS

Four Men Prominent in Public Life Are to Address Association at Midyear Dinner—Way Committee Considers Standard Spirals and Co-operation with Equipment Committee on Tread and Flange Contours

Mid-Year Meeting Dinner Speakers

At the dinner to be held in connection with the mid-year meeting at the Copley-Plaza Hotel, Boston, on Feb. 16, President L. S. Storrs will preside and the following will speak: Hon. Samuel W. McCall, Governor of Massachusetts; Hon. Warren G. Harding, United States Senator from Ohio; Hon. James M. Curley, Mayor of Boston, and Hon. Job E. Hedges, New York City.

At the meeting, as previously announced, J. D. Mortimer will present the report of the committee on social relations prepared by H. G. Bradlee, E. W. Rice, Jr., and himself; E. E. Rice, Boston, will open the discussion on this report; Bentley W. Warren, Boston, will read a paper on "Wage Arbitration and Contracts," and Robert Frothingham, New York City, will read a paper on "Salesmanship in the Electric Railway Business."

Way Committee Meets

The first meeting of the 1917 committee on way matters was held in New York on Jan. 19, 1917. C. H. Clark, Cleveland, Ohio, chairman of this committee, presided, and the following members were in attendance: A. E. Harvey, Kansas City, Mo.; E. M. T. Ryder, New York, N. Y.; W. F. Graves, Montreal, Quebec, Can.; W. R. Dunham, Jr., New Haven, Conn.; C. G. Keen, Philadelphia, Pa.; H. H. Ross, Toledo, Ohio; D. P. Falconer, Rochester, N. Y., and E. M. Haas, Cleveland, Ohio. The first subject considered was the revision of the Engineering Manual. A sub-committee of the committee on standards had made certain recommendations for condensing and eliminating extraneous matter from the Manual, and these were approved.

A sub-committee was also appointed to make final recommendations on the kind and size of bolts and fits for standard section and girder rails. In order to keep the recommended uniform method for designating compromise joints in the Manual it was approved as standard by the committee. A sub-committee was appointed to secure the approval or rejection by other committees interested of the symbols for recording surveys and the specifications for preservatives and treatment of woods which were submitted in the reports of the 1915 and 1916 way committee respectively.

L. M. Clark, Indianapolis, Ind., represented the equipment committee at this meeting in the consideration of wheel contours as they effect rail head contours. It was decided to retain the tread slope of 1 in 25 for all wheels and to submit a modified ¾-in. flange to member companies for criticism. It was the consensus of opinion that a standard flange thickness of 1 1/16 in. should be adopted to insure clearance through special work. Messrs. Clark and Ryder were appointed a sub-committee to reconcile the difference of opinion existing between the way and equipment committees in the matter of flange dimensions and contours.

Curved head rails were also considered quite fully. It was believed that the rail head should be designed to fit average worn wheels rather than to attempt at this time to adopt a wheel and rail contour which would provide a full line of contact. In order to arrive at a preliminary curved head rail section a sub-committee was appointed to obtain contours of average worn wheels from each of the properties represented by the committee members, and from as many other railways as possible, before the next committee meeting. The Brooklyn curved head rail section will also be submitted to a number of companies for criticism.

Messrs. Graves, Harvey and Ross were appointed a sub-committee to prepare a specification for built-up crossing frogs for steam and electric railway crossings.

The way committee also took up the question of recommending standard spirals. It was brought out that there were more than 250 spirals in use by railway companies, and this number could be reduced to about six. Mr. Ryder had consulted a number of the special work manufacturers on the subject of standardizing spirals and had found them in sympathy with such a move. Mr. Ryder submitted six recommended standard spirals for the consideration of the committee, and the special work manufacturers will be asked to criticise them before the next committee meeting. Before adjourning it was decided to hold the next meeting of the way committee in Cleveland, Ohio, in June.

Engineering Standards Committee

In the past the engineering associations committee on standards has contained the chairmen of the several technical committees with a view to the presentation of the points of view of these committees when their respective recommendations were under consideration. It has been decided, however, that better results will be secured by having the standards committee made up of others than the technical committee members in order that the work of the committees may be reviewed by an entirely different group. The 1917 committee is being reorganized on this basis.

Company Membership

A meeting of the manufacturers' branch of the American Association committee on company membership met in New York on Jan. 18 and planned to make an unusual effort to secure new manufacturer members before the mid-winter meeting. A list of 400 possible members was divided among the committee members.

Those present at the meeting were J. M. High, the Pantasote Company, New York City; J. H. Drew, Drew Electric & Manufacturing Company, Indianapolis, Ind.; W. K. Archbold, Archbold-Brady Company, Syracuse, N. Y.; John Benham, International Register Company, Chicago, Ill., and E. B. Burritt, New York City. Mr. Drew was designated as vice-chairman in charge of the campaign, the chairman being away on a business trip.

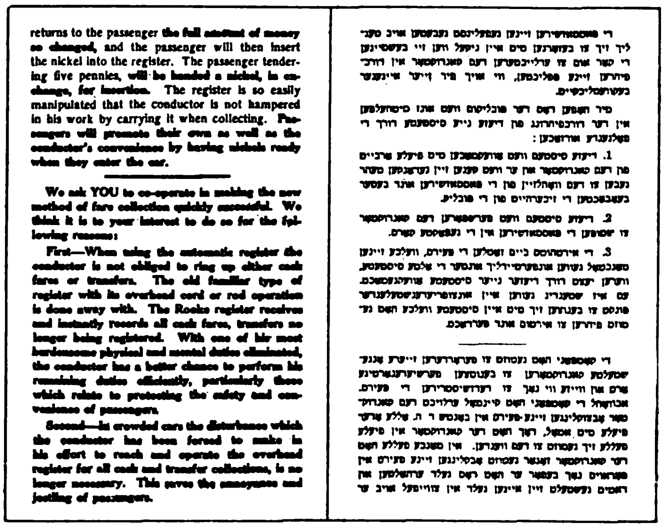
January Meeting of Denver Tramway Section

The forty-first meeting of Section No. 3 was held in Denver on Jan. 18. It was largely of a social character and more than 500 were present. Officials of the company and representatives of Denver's "Opportunities School" made addresses, and these were followed by dancing and refreshments.

B. R. T. Passengers Ring Up Fares

Automatic Coin Registers Being Used on Hamburg, Church and Ralph Avenue Lines of the Canarsie Division

IN order to enable its conductors to perform their duties more efficiently and at the same time to protect them from making mistakes the Brooklyn Rapid Transit system on Jan. 16 began the use of the Rooke automatic registers in the collection of fares on its Hamburg Avenue line. This is one of the most heavily traveled lines on the whole system, the cars during the rush hours being operated on a two and one-half-minute headway from the New York terminal of the Williamsburg Bridge. The line extends from Delancey Street, New York, over this bridge to Brooklyn and passes through a densely-traveled foreign district. Anyone familiar with this picturesque and thickly-settled section of New York knows of the congestion and heavy riding conditions. It is necessary, at times, for the conductor to bunch 'collections, which is contrary to the rules, and may involve either himself or the company in loss. In order to get the co-operation of the passengers on this line, most of whom are Jewish, four-page booklets explaining the use of the new system was printed in both English and Jewish and placed in the "Please Take One" boxes at each end of the car. A facsimile of the second page of each of these booklets is shown in the accompanying illustration. In addition, car signs directing the passengers to have their nickels ready and illustrating the method by which they should insert the coins, were posted in the car.



returns to the passenger the full amount of money so changed, and the passenger will then insert the nickel into the register. The passenger tendering five pennies, will be handed a nickel, in exchange, for insertion. The register is so easily manipulated that the conductor is not hampered in his work by carrying it when collecting. Passengers will promote their own as well as the conductor's convenience by having nickels ready when they enter the car.

We ask YOU to co-operate in making the new method of fare collection quickly successful. We think it is to your interest to do so for the following reasons:

First—When using the automatic register the conductor is not obliged to ring up either cash fares or transfers. The old familiar type of register with its overhead cord or rod operation is done away with. The Rooke register receives and instantly records all cash fares, transfers no longer being registered. With one of his most burdensome physical and mental duties eliminated, the conductor has a better chance to perform his remaining duties efficiently, particularly those which relate to protecting the safety and convenience of passengers.

Second—In crowded cars the disturbance which the conductor has been forced to make in his effort to reach and operate the overhead register for all cash and transfer collections, is no longer necessary. This saves the annoyance and jostling of passengers.

FACSIMILES OF PAGES FROM BOOKLETS EXPLAINING NEW B. R. T. FARE COLLECTION SYSTEM

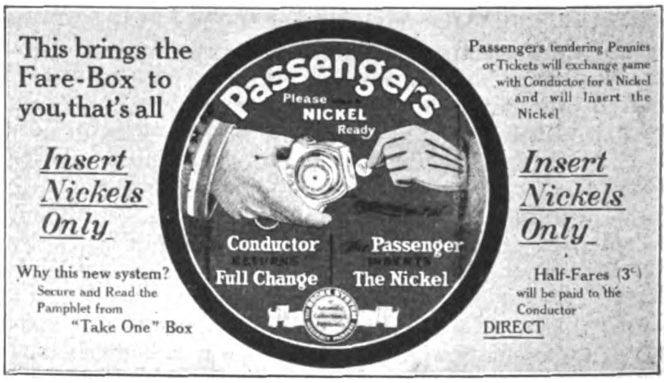
In order to install these registers, meetings for all the men were called, and a statement of the new system, its principles, etc., was made to the men by a representative of the Rooke Automatic Register Company. Immediately after this general meeting, which was held at Canarsie Depot, a group of conductors were advised to report for definite instructions which were given them in a car operated by two uniformed conductors in the employ of the Rooke Company. These men have operated this register for years in meeting crowded city conditions and were on the car to instruct the conductors and to answer all their questions. In order to show the men how the registers could be handled during the rush hours, they took out a heavily-loaded car on the 5.30 trip, operated the car, and collected the fares. These demonstrations were object lessons to the new men and gave them the necessary confidence to do the work well.

With this system, instead of ringing up cash fares and transfers on separate registers, the conductors extend the automatic collector and register toward the passengers, who insert their nickels in the register slot. An automatic device in the register grips the coin, pulls it in and instantly registers it, the coin then passing through a cup into the conductor's hand. When change has to be made the conductor returns the full amount of change to the passenger, who then puts the nickel into the register. In Brooklyn transfers are collected but not registered, the conductor keeping a record of the number received as heretofore.

B. R. T. EFFICIENCY CAMPAIGN

In the efficiency campaign which the Brooklyn Rapid Transit system has been conducting, the last few bulletins to the conductors have been under the general heading of "The Company and Its Money." One of these bulletins, which was issued to the employees of the Canarsie division, contains the following:

"In speaking about your own responsibility, the management has not forgotten its responsibility to relieve you if possible, from the confusing and difficult conditions under which fares have been collected and registered in the past. A large measure of such relief the management confidently believes is presented by the introduction of the Rooke automatic register."


This brings the Fare-Box to you, that's all
Insert Nickels Only
Why this new system? Secure and Read the Pamphlet from "Take One" Box
Passengers
Please
NICKEL
Ready
Conductor RETURNS Full Change
The Passenger INSERTS The Nickel
Passengers tendering Pennies or Tickets will exchange same with Conductor for a Nickel and will Insert the Nickel
Insert Nickels Only
Half-Fares (3c) will be paid to the Conductor DIRECT

INSTRUCTION CARDS MOUNTED IN CAR FOR GUIDANCE OF PASSENGERS

Although there are eleven transfer points on the Hamburg Avenue line, the conductors have suffered no inconvenience and the cars are not delayed owing to the issuing of transfers or the collecting of fares at these points. Altogether, a total of thirty-seven cars are operated on this line. In the early morning hours cars are operated on a 10-minute headway; during the morning rush hours a 3-minute schedule is maintained; near mid-day the cars are operated every six minutes, and during the evening rush hours a 2½-minute headway is maintained. The normal traffic in passengers per day on this line is 29,600. Of these 19,600 are cash fares and the remaining 10,000 are transfers. The earnings per car-mile are 27 cents, but this does not give a clear idea of the density of travel because the average haul is long.

Since this automatic register was placed in service on the Hamburg Avenue line it has worked satisfactorily and the foreign-born passengers appear to be pleased with it. On Dec. 23 and 26, respectively, registers were placed in service on the Church Avenue and Ralph Avenue lines of this division and as soon as the registers arrive and conductors can receive their instructions the New Lots Avenue and other lines will also be equipped.

Short and Up-to-Date Articles on

EQUIPMENT AND ITS MAINTENANCE

Turning Commutators Concentric with Shaft Journals—Track Tools to Replace Human Horse-Power—Economies Effected in Car Lighting—Second Chart Giving Cost Data on Trolley Wire Suspension—Articles on Other Shop Methods and New Apparatus

(Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.)

Getting a True Commutator

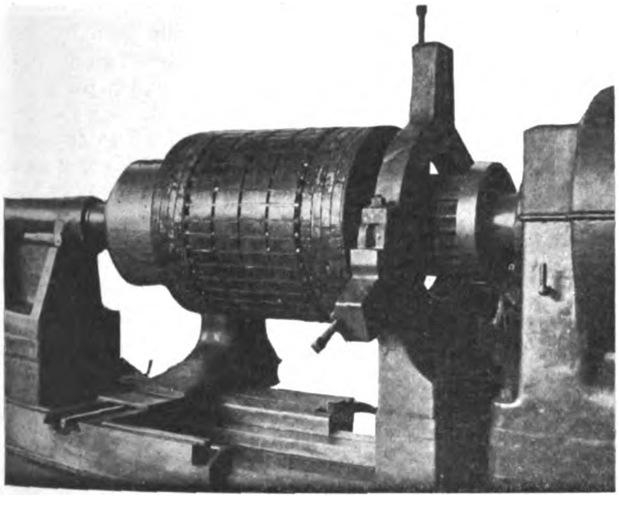
For Commutator Turning, Armatures Are Supported in Sleeve Bearings Instead of on Lathe Centers to Correspond with Service Conditions

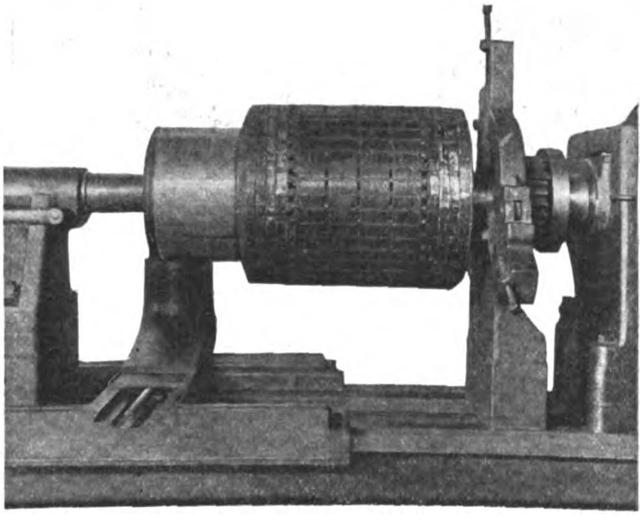
BY R. R. POTTER
Superintendent of Equipment New York, Westchester & Boston Railway

Common practice in repair shops, whereby commutators are turned by supporting the armature between lathe centers, undoubtedly provides for a smooth commutator surface, but it does not give any guarantee that the surface is concentric with that of the armature shaft-ends, or journals, and that the commutators will run true in service. Theoretically, of course, the brush-holder springs should take up any unevenness in the movement of the commutator surface, and when the armature is rotating at slow speed, this theory applies absolutely. But when speeds of the order of 1000 r.p.m. are attained, the same thing does not hold, and though the brushes may not actually jump over the low section of the commutator surface that is brought about by a lack of concentricity with the surfaces of the shaft ends on which the armature runs, there is no question that great variation in brush pressure and liability to sparking and even flashing are produced.

The establishment of a commutator surface that is absolutely true as well as smooth is usually a difficult matter for the following reasons: In the first place, the recessed centers in the ends of the armature shaft are generally made only large enough to serve for the initial finishing of the shaft before the armature is built upon it. With the weight of the armature added, which in the case of some railway motors is as much as 2000 lb., these centers are not large enough properly to carry the load. The result is that both lathe centers and shaft centers are quickly worn out of shape, the shaft centers being not infrequently worn to one side away from the true center line of the shaft.

In the second place, a considerable percentage of armature shafts are more or less sprung between the pinion and the pinion-end bearing shortly after being placed in service. These slight bends are caused by reversing the motors or other incidents that bring about extraordinary strains upon the shaft. In such cases, it often happens that the shaft is not bent sufficiently to affect the proper meshing of the pinion and gear, but nevertheless the center is thrown out of line enough to influence the concentricity of the commutator when it is turned in a lathe and is swung between the lathe centers. Still another reason for difficulty in turning commutators is that as a rule the lathe centers are not kept in a sufficiently accurate condition to insure trueness of work that is turned on them. This is particularly the case when exceptionally heavy pieces such as armatures are frequently swung in the lathe and when the recessed centers on the work are under size.

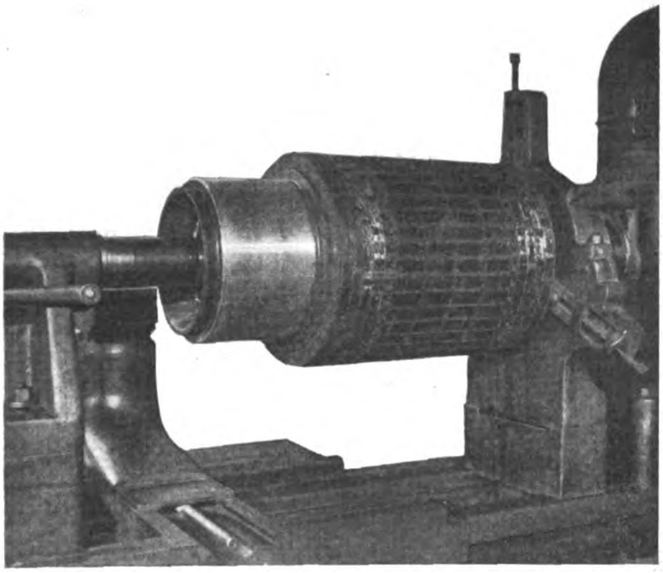

STEADY-REST SUPPORT AND DRIVE AT PINION END OF ARMATURE SHAFT


ARMATURE SWUNG IN SLEEVES ON SHAFT INSTEAD OF LATHE CENTERS

To avoid the difficulties outlined above and to insure the production of a finished commutator that will run absolutely true with the journal bearings after turning, the New York, Westchester & Boston Railway has adopted in its shops the practice of turning all commutators by setting the armature shaft ends in sleeves corresponding to the armature shaft bearing, one sleeve being attached to the tailstock and the other carried in the steady-rest of the lathe in place of the ordinarily used lathe centers.

From these illustrations, it may be seen that a sleeve bearing has been slipped over the tailstock, this serving as a support for the shaft extension at the commutator end of the armature. At the pinion end of the armature, a standard pinion-end armature bearing is supported in the lathe steady-rest. This bearing in the steady-rest is first centered as accurately as possible with the armature supported between the lathe centers, after which the lathe centers are removed and the weight of the armature taken directly on the bearing. Once this steady-rest is set, there is no need to change it for turning other armatures, and the steady-rest may be left without any readjustment in setting unless, of course, other work that requires the use of the rest has to be done. The armature is driven through a short piece of bar iron attached to the face plate and engaging with the pinion teeth.

In practice it has been found that the weight of the armature is ample to make it run perfectly steady in the bearings without any tendency toward chattering, the reason being, undoubtedly, that the cuts taken across the face of the commutator are invariably light and work is done on such a soft material as copper. The results in service have, of course, been very satisfactory. In the past, commutators turned in the ordinary way on lathe centers have been found to be as much as 1/16 in. out of true, and the elimination of such variations can only be desirable from an operating and maintenance standpoint. With the new method of turning, it may be said, no great necessity exists for establishing exact central positions for the bearing sleeves. If both are off center by an equal amount, the only effect will be a negligible change in the position of the cutting tool relative to the work. If one sleeve is off-center and the other is not, the result will be that the commutator surface will be turned with a slight taper, although the amount of taper will be negligible. In no case can the commutator surface be turned out of concentricity with the shaft, except where the sleeves are allowed to be so loose as to permit an appreciable movement of the shaft in a horizontal plane with the sleeves, and this, of course, can be avoided with a small amount of care on the part of the machine hand.


SLEEVE SLIPPED OVER TAIL STOCK CENTER TO SUPPORT COMMUTATOR END OF ARMATURE SHAFT

The armature slotter used in the Howewood shops of the Pittsburgh (Pa.) Railways is equipped with a suction blower attachment arranged so that all the copper and mica dust is drawn through a 2-in. tin pipe and deposited in a box. Considerable saving results from the reclaimed copper, and the surrounding air is kept pure.

Labor-Saving Tools for Way Department

Mobility Is an Important Element in Devices for Handling Way Materials—Tampers and Welders Are Money Savers in Maintenance Work

BY W. R. DUNHAM, JR.
Engineer Maintenance of Way The Connecticut Company, New Haven, Conn.

The article in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 23, 1916, on cutting costs in storage yards shows what may be done in the mechanical handling of material in its first stage as raw material in the railway system and in its initial start for the "job." Any economy at this point, however, may be greatly offset, if not entirely lost, in the subsequent handling to and at the location of work. While it is true, therefore, that a yard full of cranes, derricks and other appliances for the saving of labor is very desirable, the same or a greater amount of money will give better results if spent for moving units which can be used at both loading and unloading points.

As an illustration, the saving effected by the crane car mentioned in the article in the JOURNAL would have been 50 per cent less had the crane been fixed in the yard, so that the addition of wheels at least doubled the saving of the device. In other words, mobility of the equipment made it worth while.

One of the implements in the labor-saving class which is well worth considering is the electric shovel. On two jobs, not totaling 2 miles of single track, the difference in cost of excavating by hand over that of excavating by shovel was 73 per cent of the cost of the shovel, so that these 2 miles practically paid for the shovel and the rest of its work is nearly all gain. Not only was the cost of excavating cut 66 2/3 per cent, but the cost of teams was cut 50 per cent, a very desirable result when teams were not only high in cost but difficult to get. This saving was made by a green man at the shovel, and will be lowered as the operator becomes experienced.

Another help in lowering costs is one or more sets of power drills. These machines cut the costs of track work in their sphere 75 per cent over hand methods. The use of the pneumatic tampers also will show a saving not only in the actual first cost of work, but in the number of men required, in efficiency, and in time. In addition the ties are actually better tamped so that future maintenance costs are reduced.

While the use of arc welders may be overdone, there is no question but that their judicious use reduces the cost of maintenance and prolongs the life of rails and special work. Their use, of course, entails the purchase of suitable grinding apparatus. These grinders, however, are not limited to following up the welders since, in addition, they have a well-defined sphere of their own.

The article in the issue above referred to illustrated a crib for handling ties, and gave costs showing the saving made by its use. This method, however, would not give a saving unless the ties were delivered at a central yard at first. On a road where ties are received and piled by the dealer, thence hauled direct to the various jobs as needed, its use would mean a second handling and possibly duplication of equipment.

The ideal of perfect track construction has not yet been reached, nor is economy on one property necessarily an economy on another. Every road has its own distinct problems, which must be studied and met, and while a knowledge of what the other fellow is doing is a help in the right direction, an automatic following of his method will not produce the same results.

Economical Car Lighting

The Author Describes the System Used on the Cars of the Washington-Virginia Railway

BY W. A. ARMSTRONG, JR.

The changes and improvements that have been made in car lighting have resulted not only in better lighting but in cheaper lighting as well. Means for improvement that have received most attention are the use of tungsten lamps, properly designed reflectors and shades, fixtures for supporting the reflectors and lamps in such a manner as to prevent their injury as well as to insure the safety of passengers, and methods for operating headlights in a manner to eliminate the waste of power that results when the headlight is placed directly across full line potential in series with resistance. Efforts in this direction have been intended to improve relations with the public by providing cheerful, brightly lighted cars.

A typical installation recently made by the Electric Service Supplies Company for the Washington-Virginia Railway, Washington, D. C., illustrates the latest practice in car lighting. A description of the installation is given here through the courtesy of R. W. King, general manager of this railway. The company operates 64 miles of line connecting Washington, D. C., with Alexandria and Mount Vernon, Va. It is double-tracked from Washington to Alexandria and single-tracked from Alexandria to Mount Vernon, operating two-car trains at speeds up to 50 m.p.h. The conditions are not peculiar in any way, therefore the application of this car-lighting system is perfectly general.

The lighting equipment originally consisted of eighteen 23-watt lamps grouped as shown in the accompanying illustration, with an additional lamp on each platform, making a total of twenty lamps. The headlight equipment consisted of one standard 4½-amp. luminous arc, arranged with an auxiliary incandescent lamp for dimming.

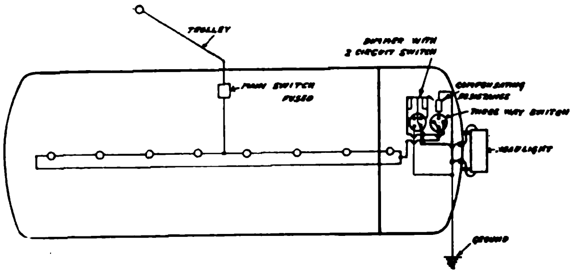
The power required for the former installation was 3160 watts, *i. e.*, 460 watts for the car lamps and 2700 watts for the headlight. Figuring the energy purchased by this company at 1 cent per kilowatt-hour for an average of five hours of night service and for 365 days per year, it is seen that the cost of power for lighting one car amounted to approximately $57.70 per year.

The redesigned lighting system for the remodeled cars consists of seven 72-watt lamps with reflectors, together with one similar platform lamp. The eight lamps are wired in two parallel circuits, each having four lamps in series, and connected in series with a Golden Glow headlight equipped with a 12-in. mirrored glass reflector and a 150-watt concentrated filament lamp.

The power required for this installation is 726 watts, the eight interior lamps requiring 576 watts and leaving only 150 watts for the headlight. The cost of lighting for the improved installation, calculated on the same basis as before, amounts to $13.25 per car per year, effecting a saving of $44.45 per year.

The safety fixtures used are of the round base, straight-pendant type, fitted with heavy-density opal glass reflectors for properly distributing the light. The fixture clamps the shade by means of flexible metal fingers to provide for expansion and contraction of the glass and to prevent rattling, as well as to cushion the reflector against severe jolts of the car.

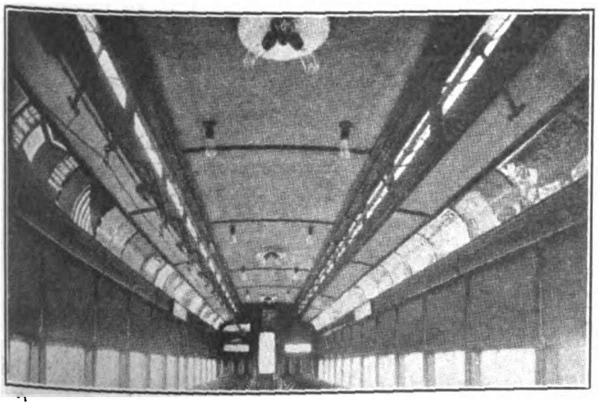
The Golden Glow headlight, with a 150-watt lamp, provides illumination equal to the 4½-amp. luminous arc. It also gives a soft yellow beam of light for which motormen almost invariably express their satisfaction after becoming accustomed to the colored rays. For dimming the headlight within city limits, a special dimmer has been devised and application for a patent upon it has been made. By turning a snap switch the headlight is dimmed without affecting the car lamps, and also without causing a great loss of energy as in the series resistance method.



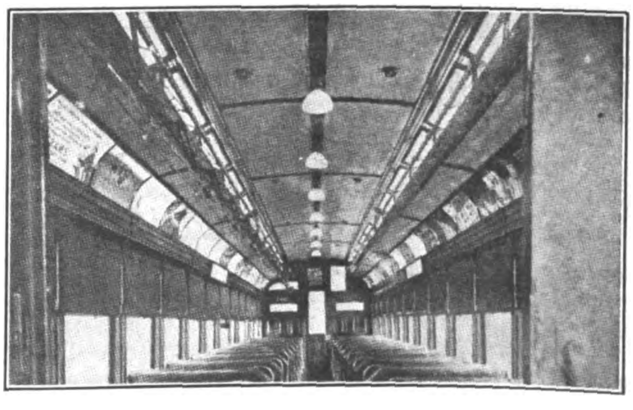
SIMPLIFIED DIAGRAM OF REDESIGNED CAR LIGHTING CIRCUIT

Since the laws of Washington, D. C., require that the headlight be turned out when a car stands at a terminal, these cars were each equipped with a compensating resistance equal to that of the headlight lamp which it replaces when cut into the circuit. This resistance, when used, obviously has no effect upon the interior car lamps and may be used in the circuit with them when a headlight lamp is burned out and is being replaced. In case one of the car lamps burns out, the headlight is burned temporarily in series with the remaining circuit at about one-half its usual intensity.

The cost of the installation, done while the cars were going through the shop, was about $85 per car. The average annual maintenance cost of an arc headlight is placed at $25. This amount compared with the cost of replacing two lamps for the Golden Glow headlight at $2 each shows a saving of $21, which, added to the saving in cost of power as explained above, gives a total saving of about $65.50 per year per car afforded by



INTERIOR OF CAR SHOWING FORMER ARRANGEMENT OF LAMPS



PRESENT INSTALLATION SHOWING IMPROVED APPEARANCE the new installation. Since eight car lamps now replace twenty as used formerly, the cost of lamp renewals is reduced, especially since the larger lamps have more rugged filaments and in a vertical position are less affected by vibration. After four months in operation these cars have had no failures of either car or headlight lamps.

Economies in Track Construction Due to Equipment

Results Which Have Been Obtained with the Pneumatic Tie Tamper and the "Skull-Cracker"

BY D. P. FALCONER
Engineer of Maintenance of Way New York State Railways, Rochester, N. Y.

It is a generally admitted fact that human horsepower is the most expensive kind of power which can be purchased, and it is for this reason that any equipment or machine which will transform electric or other energy into useful work in track construction or maintenance is economical. It is with this idea in mind that this company has endeavored to equip its track gangs with such labor-saving devices as are obtainable and suitable for its use.

One of these tools is the pneumatic tie-tamping outfit which we have had in use for the past two years. We have operated this machine with a gang of five men, one operator, two ballast distributors and two tampers. The ballast distributors and tampers alternate, and in this way avoid any excessive jar or possible fatigue due to the continued use of the tamping tools. The operator is the only man in the gang who is paid more than the regular laborers' rate and we have used common labor entirely for tamping track.

We find we can tamp from seventy to ninety ties per day which, assuming twenty days to the month and six months to a year as a working season, gives us about 4½ miles of track tamped. This, of course, means new track or track which has been entirely reconstructed.

We have not obtained this record, however, with the use of our tamping outfit because we have used this outfit also for installing our riveted joints. These joints are the patented design as exhibited at the Atlantic City Convention and described in the ELECTRIC RAILWAY JOURNAL in the Nov. 4, 1916, issue, page 982. A number of other uses for compressed air have been noted in the columns of this paper and undoubtedly this method of transforming energy will find a wide variety of uses in track construction and maintenance.

Another piece of equipment which has been used by us with excellent success during the past season is what is known as a "skull-cracker." This is a pear-shaped piece of cast iron weighing approximately one ton and frequently used in junk shops and other places for breaking up old iron castings. This device was applied to the breaking up of concrete in track which was to be reconstructed. The equipment used was a small derrick operated on the track to be reconstructed after the paving was removed, and arranged with a special hook so that when the "skull-cracker" had been lifted to a height of 12 ft. or 15 ft. the trigger would release the weight and it would fall, thus shattering the concrete and making it easy for the men to pick it loose and remove it from the track. It was found that about three blows of this "skull-cracker" would break up the concrete across the track for a distance of 2½ or 3 ft. in length. Several hundred feet of concrete could be broken up in one day, resulting in a saving of from 15 cents to 20 cents per foot of single track in the labor item. In removing this concrete from the track it was piled alongside of the trench, and after the new track was laid on the subgrade the concrete was put through our portable stone crusher, which was described in your columns in the Feb. 5, 1916, issue, page 277, with the result that we were able to ballast this track with the old concrete removed, thus making a saving in ballast and also eliminating the loading and hauling of this material off the street and hauling and unloading the new material onto the street.

While it is impossible to accomplish all of these economies on all jobs, schemes of this kind can be worked out, to very great advantage and at considerable saving in cost, especially when the gangs are equipped with such tools as the above and with electric drills, welders, rail grinders, concrete mixers, etc. It is, therefore, by proper selection of equipment for each job that a saving can be made in construction and maintenance costs of electric railway work, and while each job does not give an opportunity for the economical use of all equipment, yet if gangs are equipped with a complete outfit great saving can be made by the proper planning of the work.

Data on Stoker Installation Show Low Maintenance Cost

The costs of repair parts and material for four 10-ft. x 10-ft. chain-grate stokers and their furnaces operated over a period of six years have the low values shown in the table below. It will be noted that the cost of the tile and fireclay was 85 per cent of the total material and repair part cost. The cost of replacing operating parts of the four stokers was but $8.77 per stoker per year, which is a small percentage of the present cost of such a unit, $1,800 without firebrick. The fact that in the table the 1912 cost appears rather high is accounted for by the purchase of one complete 9.5-ft. x 6.5-ft. arch and ninety large 4-in. x 12-in. x 24-in. bridge wall tile in that year at a total cost of $498.22. The data given relate to an installation of Illinois Stoker Company's chain-grate stokers in a Mid-West electric railway company's power plant.

COST OF STOKER AND FURNACE REPAIRS FOR SIX YEARS

	Cost of Repairs		
	For Stoker Parts and Iron Parts of Arch and Feed Gate	For Tile and Fireclay	Total
1910	$60.00	....	$60.00
1911	14.00	$142.25	156.25
1912	61.12	823.17	884.29
1913	40.50	67.50	108.00
1914	3.00	217.00	220.00
1915	33.25	190.25	223.50
1916	189.01	894.70	1,083.71
	$400.88	$2,334.87	$2,735.75
Total per stoker per year	$16.70	$97.29	$113.99

Flexible Conduit Used by Boston Elevated

Flexible woven conduit is being used by the Boston Elevated Railway in renewing the heating, lighting and ringing circuits and in equipping their cars with Tomlinson drawbars. The Tomlinson drawbar is constructed with insulated electric conductors forming a part of it, the terminals of these conductors being designed to make connection with corresponding terminals on the next car when the drawbars are coupled together. The wires running from the car body to the drawbar are subjected to repeated bending on account of the drawbar swinging sideways as the car turns curves, and therefore they must be run through a flexible duct. Single wall flexible woven conduit was found to be the most satisfactory for its durability and for its tendency to prevent chafing of the insulation which finally results in injury to the conductor itself.

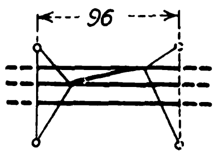
Cost of Erecting Overhead Work—II

(From the records of a large Eastern company)

The following is the second group of a series of diagrams with cost figures to show actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. In the first group of this series, which appeared in the issue for Jan. 20, page 127, none of the figures included the cost of superintendence and engineering.

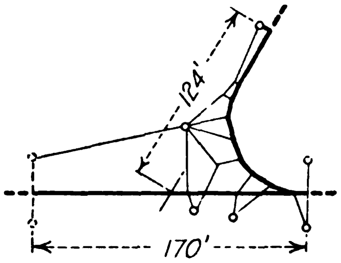
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Right-hand crossover and siding



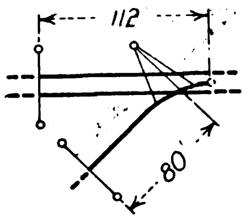
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
11	$15.95	$6.60	$19.14	$7.92	$22.33	$9 24

Single-track, right-hand branchoff, angle 120 deg.



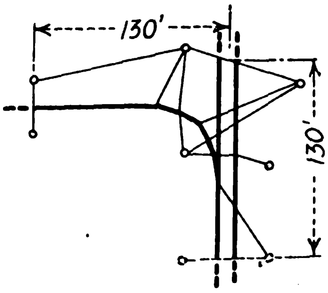
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
12	$15.95	$6.60	$20.74	$8.58	$23.93	$9.90

Single-track, left-hand branchoff, angle 45 deg.



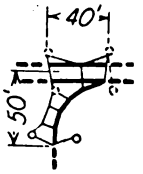
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
13	$15.95	$6.60	$19.14	$7.92	$22.33	$9.24

Single track, left-hand branchoff, from double track, angle 90 deg.



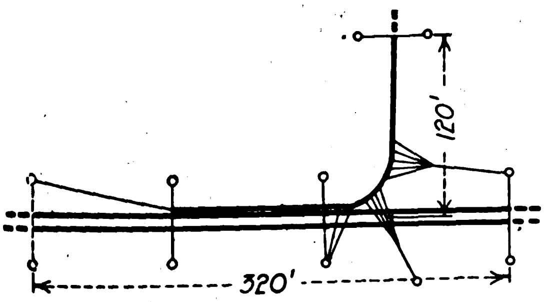
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
14	$15.95	$6.60	$19.14	$7.92	$22.33	$9 24

Single track, left-hand branchoff, angle 90 deg.



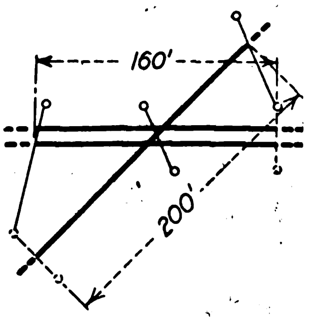
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
15	$15.95	$6 60	$19.14	$7.92	$22.33	$9.24

Single track, left-hand branchoff, to freight siding with unbroken main line connection



No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
16*	$29.04	$21.12	$36.30	$26.40	$45.38	$33.00

Single track, crossing, double track, angle 45 deg.



No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
17*	$18.15	$13.20	$21.78	$15.84	$27.23	$19 80

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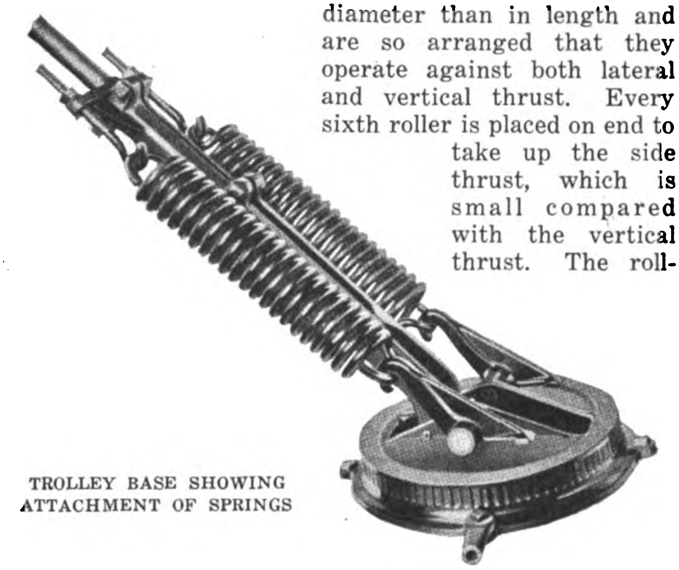
*Trucking includes cost of extra reel truck. None of the figures on this page include cost of superintendence and engineering.

New Anti-Friction Non-Retrieving Trolley Base

The principal feature of a new Wasson non-retrieving trolley base, for which Holden & White, Chicago, Ill., are general sales agents, is its roller-bearing mounting with an unusually large bearing area. This feature has been quite successful in extending the life of the base by preventing the wearing of pits and waves in the bearing surface. The main bearing has 120 sq. in. of area and 215 rollers, which are slightly larger in diameter than in length and are so arranged that they operate against both lateral and vertical thrust. Every sixth roller is placed on end to take up the side thrust, which is small compared with the vertical thrust. The rollers taking the latter have both a rolling and a sliding action, giving constantly shifting bearing points, which distributes the wear over the bearing surface. This action keeps the bearing surface clean, and insures good electrical connection between the upper and lower plates. The large diameter of the bearing tends to minimize the pressure upon it, insuring long life of the bearing and consequently that of the trolley base.



TROLLEY BASE SHOWING ATTACHMENT OF SPRINGS

Each roller gives a 3/8-in. line contact between the upper and lower bearing surfaces of the raceway, which is 13 in. in diameter, and the rollers form the current path between the movable and stationary parts. The over-all height of this base is 5 in. and it weighs 100 lb., the construction being similar to the retrieving base of the same make. The current cable can be attached to any one of the four lugs, making a very accessible connection.

By attaching the springs to the pole more than 2 ft. from its fulcrum point, the makers secure a quick spring action, which tends to prevent the dewiring of the wheel at uneven places in the wire. The opposite ends of the springs are located in such a position, relative to the pole fulcrum, that an increase or decrease in spring tension, due to the movement of the pole, is overcome by a change in the length of the power arm to produce a uniform force at the wheel. This tends to prevent the wheel from leaving the wire where it is high, as for instance at railroad crossings.

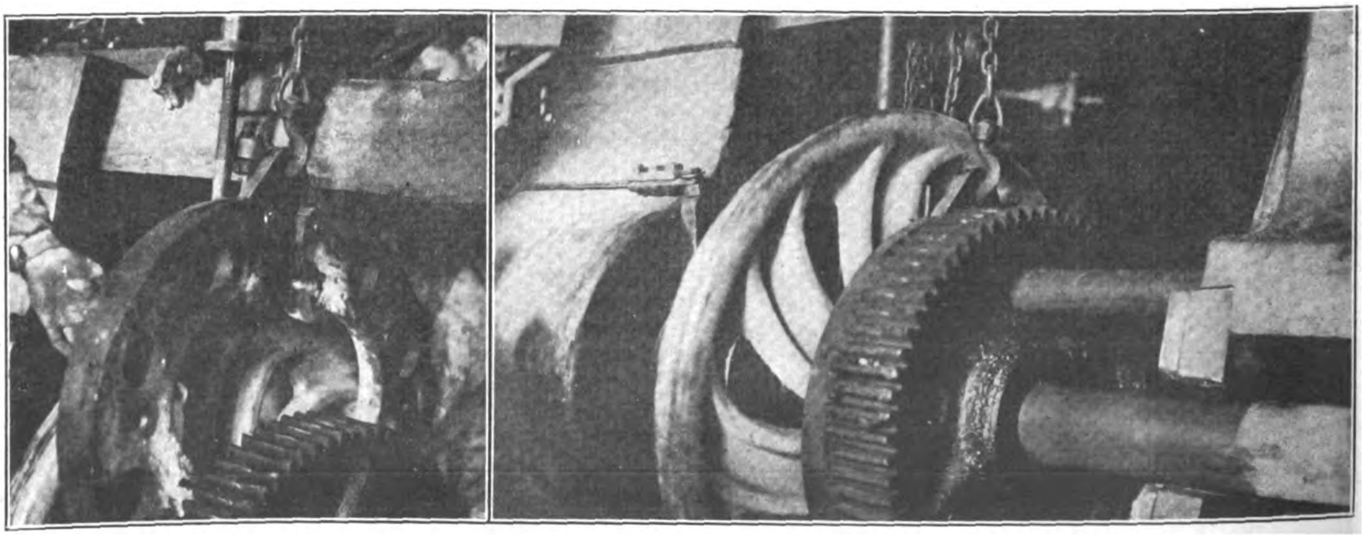
In case the trolley pole leaves the wire and "throws over" beyond a certain point, the springs are brought into tension again, and serve to check the motion of the pole as it approaches a vertical position. This is accomplished by means of an extension lug which forms an integral part of the spring hook, and engages the main base as the pole goes beyond its highest working position. The travel of the hook is thus limited and a line of spring tension at a new angle to the pole is established, thus virtually shortening the springs. If the trolley wheel leaves the wire at a low position and the rope breaks, the springs gradually bring the pole to rest after it passes a certain position, thereby obviating the damage to the equipment which might result if the pole is stopped suddenly.

Pressing Off Car Wheels

A method has been devised by M. B. Osborne, master mechanic Galveston Electric Company, for pressing off a car wheel when a gear is on the axle adjacent to the wheel. The device consists of a steel collar 26 in. in diameter and 3½ in. thick. It was made from a flange coupling taken from a shaft which was a part of an old steamboat equipment.

As seen in the photograph the flange was simply cut in two and then the two halves were hinged to provide a means of support in handling. The large holes shown in the collar were originally provided to fasten together the flanges of the coupling, and though not used for any purpose now are advantageous in making the device lighter. Two rods, used to press off the wheel, are passed through holes in the gear and are held firmly in place by means of the small holes shown in the collar. These small holes are so arranged that the rods may be set and held in place whether the gear has three or four holes, thus making the application of the device general.

This device is very inexpensive and convenient. The split flange is lowered into place by means of a chain block and fastened around the axle, the rods are set in place and the wheel is quickly pressed off.



LOWERING COLLAR INTO PLACE ON CAR AXLE—COLLAR AND RODS IN POSITION FOR PRESSING

News of Electric Railways

Traffic and Transportation

Financial and Corporate   Personal Mention   Construction News

Chicago Committee Hears Railways

Mr. Busby States Position of Companies on Subway Commission Report — Enabling Legislation Necessary Before Progress Can Be Made

At a meeting of the local transportation committee of the Chicago City Council, Jan. 22, which was attended by Samuel Insull, Henry A. Blair, Britton I. Budd, Leonard A. Busby, Gilbert E. Porter, and other electric railway officers, Alderman Henry D. Capitain, chairman of the committee, called upon Mr. Busby to state the position and attitude of the companies with respect to the report of the Chicago Traction & Subway Commission.

MR. BUSBY'S PLEA

Mr. Busby confined his remarks principally to the franchise consideration upon which depends the practicability of the subway plan. The physical plan recommended by the commission appealed to him. The crux of the whole plan, however, was the franchise arrangement. On this the commission made no definite recommendation. Mr. Busby estimated that between $275,000,000 and $300,000,000 will be required to carry the scheme to completion. This can be raised only through a sound financial plan based on a satisfactory franchise. According to Mr. Busby there was no use to proceed with the discussion of any other phase of the plan until after the franchise matter was settled. It was generally conceded that legislation was necessary to enable the city to grant a franchise for more than twenty-five years, to make possible the unification of the elevated and surface line companies. It would be impossible to raise the money with a twenty-year grant as a basis. The City Council should formulate its policy and take steps at once to secure the legislation desired if anything was to be accomplished at the present Legislative session.

The commissioners report outlined a terminable, or as it is more generally known an indeterminate, franchise as one of two possible plans of financing the undertaking. Mr. Busby believed that the terminable franchise offered the only other satisfactory agreement which would serve all interests to the best advantage. The terminable franchise might in effect become perpetual, but there could be no cessation of the operation of the cars, and this implies a continuation of service under term franchises renewed under a new terminable franchise. As long as the terminable franchise under the proposed plan gave control of the property to the city, the objections to the perpetual grant were entirely outweighed by its advantages.

PROBLEM LARGELY FINANCIAL

Mr. Insull said that the problem was purely a financial one, and included the financing of about $500,000,000 of new securities divided about half and half between construction work and refunding of existing securities. In order to raise this sum of money, a basis of financing must be provided by which it can be secured cheap. The investment must eventually come out of the pockets of the people who ride, and it was to the city's advantage to devise the most economical way to finance the work. The terminable franchise was best suited to this.

Several aldermen objected to the terminable franchise because of its perpetual aspects. A resolution was then passed directing Walter Fisher, the committee's special counsel, to draw up a resolution for discussion which would cover the several points of enabling legislation necessary, and include the shortest definite-term franchise under which it would be possible to carry out the commissioners' plan. In this connection Mr. Blair said that he was certain nothing under fifty years would be considered by the men to whom it would be necessary to look for financing the proposition.

Court Against United Railroads

Injunction to Prevent Paralleling of Tracks by Municipal Lines Denied by Judge Hunt of United States District Court

San Francisco's right to lay railway tracks upon city streets without regard to existing franchises held by private companies was upheld in a decision by Judge William H. Hunt in the United States District Court at San Francisco on Jan. 18. The decision denies the United Railroads an injunction preventing the city from building parallel tracks along Market Street from Kearny to the mouth of Twin Peaks tunnel.

The suit for the injunction was filed by the United Railroads last June and a temporary restraining order was granted, after the city had begun laying a crossing of the United Railroads' tracks at Van Ness Avenue and Market Street, to extend the Van Ness Avenue line out Market Street to Church. The case was argued before Judge Hunt in August and was finally submitted on Oct. 14.

HOW CITY OFFICIALS INTERPRET ORDER

The decision is interpreted by city officials to mean that the municipality may build its own lines along any streets within the city limits whether or not these streets are occupied by the tracks of a private corporation. Pending further litigation the city understands that it has a wider latitude than that which was accorded rival traction companies by the Legislature when one company was granted the right to use the tracks of another for a maximum distance of five blocks. The decision says:

"It is accepted that the destruction of the franchise is not possible; but even so, in the complexity of modern society new conditions present themselves which may call for the safeguarding of the public interests in a way which justified the application of the doctrine that the police power may extend to all great public needs.

"It is very important to note that words of direct expression or intention to grant an exclusive franchise are not to be found in the instrument itself (the franchise) nor does it appear that exclusiveness was a positive consideration for the contractual obligation nor is there any expression by apt words to show that the city intended to exclude itself from exercising the privilege of establishing a street railway of its own. No deliberate purpose to make a surrender of exclusive rights appearing, I accept the more reasonable interpretation of the language used, and regard the franchise as not conferring such exclusive rights as against the city."

DECISION BASED ON KNOXVILLE CASE

The court based its decision largely upon the Supreme Court decision in the Knoxville water case. In that case the city of Knoxville had granted an exclusive franchise to the water company to supply the city with water, but the Supreme Court held that this did not bar the city from going into the water business, although it did exclude competition by a private company. In short, in the San Francisco decision the court ruled that the right of a municipality to those privileges which it grants to private corporations by a franchise cannot be forfeited or lost.

It is believed the United Railroads will appeal first to the United States Circuit Court of Appeals and then to the United States Supreme Court at Washington on the ground that the laying of parallel tracks practically confiscates its franchise, which is a property right, and is thus a violation of the United States Constitution.

Immediately after the decision city officials decided upon the following construction program:

1. Construction of the Church Street line from Sixteenth

and Church Streets to Van Ness Avenue and Market Street.

2. Double tracking from Van Ness Avenue and Market Street to Twin Peaks Tunnel.

3. A double-track line from Van Ness Avenue and Market Street to Kearny and Market Streets, giving through connections from Sloat Boulevard to the ferries.

Item 1 will be undertaken first. The funds for this connecting link, amounting to $110,000, have already been appropriated and it is expected that the work can be completed within three months. Other features of the proposed construction program will bring the total cost up to $442,000.

Tacoma Relief Petition Heard

Company Seeks to Have Gross Earnings Tax and Paving Requirements Rescinded

The hearing relative to the petition of the Tacoma Railway & Power Company to be relieved of certain franchise provisions was held before the Public Service Commission of the State of Washington in Olympia, on Jan. 15. The company asks that the tax of 2 per cent on gross earnings and the obligations to pave streets both be rescinded. It contends that reduced earnings have made it impossible to fulfill the obligations of the franchise without jeopardizing the utility. The case came before the commission on an objection interposed by the city of Tacoma to the jurisdiction of the State Board.

City Attorney U. E. Harmon, of Tacoma, made the principal argument for the municipality, contending that the commission is not empowered to afford relief to the company from its contractual obligations with the city. Attorney James B. Howe, for the company, argued that the commission has jurisdiction and can abrogate franchise obligations.

OTHER CITIES REPRESENTED

Owing to the importance of the hearing to municipalities of the first class, the cities of Seattle, Spokane, Bellingham and Everett had representatives present. Issues argued were based on a motion to dismiss raised by Mr. Harmon on grounds that the company seeks to abrogate franchises which have all the force and effect of contracts and that the only relief possible is through the courts. Jurisdiction of the commission over any function of public utility operation, other than as to regulation of fares and service, was denied. Hugh M. Caldwell, corporation counsel of Seattle, maintained that under the present law the public utility companies which feel that they can not meet contract obligations must obtain relief through the Legislature or surrender their franchises. Walter F. Meier, for Seattle, maintained that while the Public Service law has invested the commission with police power over rates and service, it has excluded broader powers of jurisdiction from the commission, and that these remain with the city.

THE COMPANY'S ARGUMENT

Mr. Howe, for the company, argued that as the statute places the company under commission regulation, in all particulars of operation, and limits its charges to a 4-cent fare within the corporate boundaries of a city, at the same time guaranteeing to it a fair return on money invested in return for adequate service, power is thereby conferred upon the commission to remove any franchise restrictions that make it impossible for the company to live up to conditions imposed by the State in establishing commission regulation. In support of its petition to be relieved of a gross earnings tax of 2 per cent imposed in Tacoma, street maintenance expense and other contributions, the company submitted a statement showing a deficit of $218,000 from Tacoma operations.

At the close of the arguments the commission took under advisement the contentions raised by the cities of the State against the commission assuming jurisdiction over public utility franchise conditions. If the commission decides to assume jurisdiction, a hearing will be held and evidence taken on the company's claim that it can no longer furnish adequate service and meet the contract conditions at the statutory fare, within the limits of an incorporated city.

Cost of Living Discussed

Company in Portland, Ore., in Striking Treatment Compares Cost-of-Living Nickel with the Street Car Nickel

The Portland Railway, Light & Power Company, Portland, Ore., published in the annual edition of *The Morning Oregonian* of that city, dated Jan. 1, a full-page advertisement, headed "A Study of the Cost-of-Living Nickel *vs.* The Street Car Nickel." The text was divided under the heads "The Cost of Living" and "The Street Car Ride," there being one paragraph under the former and three under the latter head. On the cost of living the company said:

"The unprecedented increase in the cost of the necessities of life in recent years, and particularly in the past year, has become a national problem and is engaging the attention of the Federal Government. It is estimated that the purchasing power of the nickel has been virtually cut in two in the last thirty years and that the reduction in its purchasing power has been about 40 per cent in the last twelve months."

At the right-hand side of this statement was printed "5c.," under the dates 1886, 1915 and 1916, to show by their relative sizes the shrinkage in purchasing power of the nickel in buying things to eat and wear.

The first paragraph devoted to the street car ride follows: "In 1886 you could ride a distance of only 2.75 miles in one of Portland's old horsecars for a single 5-cent fare. Transfers were unknown in those days, at least in Portland. In 1916 you can ride a distance of 18.7 miles for the same 5-cent fare, or practically seven times as far as you could thirty years ago, thanks to our long suburban lines and universal transfers."

At the right-hand side of this statement was printed "5c." under the dates 1886 and 1916, to show by their relative sizes the comparative length of the car ride in Portland thirty years ago and to-day.

The second paragraph devoted to the street car ride follows:

"While it is rather difficult to make exact comparisons as to the saving of time spent riding to and from your work nowadays as compared with the days of the old, slow, easy-going horsecars, a fair estimate is that the average street car patron saves fully two-thirds of the time formerly consumed in that manner."

At the right-hand side of this statement was printed "5c." under the dates 1886 and 1916, to show by their relative sizes the comparative speed or time-saving element of the old horse car and the modern trolley car.

The third paragraph devoted to street car rides follows: "There has been a substantial increase in the comfort, safety and convenience of street car patrons in the past thirty years, due to better roadbed, better ventilation, heating, lighting and seating facilities of the modern electric cars as compared with the ancient horse car. Probably 100 per cent would not be an overestimate of the improved facilities and comforts in the past thirty years."

At the right-hand side of this statement was printed "5c." under the dates 1886 and 1916, to show the relative comfort, convenience and safety to passengers to-day and thirty years ago.

The fourth paragraph devoted to street car rides follows: "There has been a tremendous increase in the cost of everything entering into the production of the street car ride in recent years. Material, labor, equipment and supplies of all kinds have substantially advanced in cost. A very conservative estimate based on the experiences of electric railways generally is that this increase will average fully 50 per cent, considering all items."

At the right-hand side of this statement was printed "5c." under the dates 1886 and 1916, to show by their relative sizes how the cost of producing the 5-cent car ride has increased in three decades.

The advertisement was concluded with this statement:

"Since Jan. 1, 1907, and up to and including Nov. 30, 1916, this company has carried the enormous total of 810,363,205 persons on its cars without the loss of the life of a single passenger."

International to Spend $1,000,000

President Connette Announces That Fifty Cars Will Be Purchased and Other Expenditures Made

More than $1,000,000 will be spent in improvements within the next six months by the International Railway, Buffalo, N. Y. Edward G. Connette, president of the company, announces the company will purchase fifty new cars of the front and rear entrance and center-exit type. These will be used on the city lines. The thirty-three cars which were destroyed by fire in the Cold Spring and Broadway carhouse last year have been replaced with the exception of eleven, which are now being rebuilt in the company's Cold Spring shops. Other old-type cars, which have been out of service for some time, are being rebuilt and repaired by the company.

The 10,000-hp. steam turbine ordered by the company a year ago will be delivered in February and will probably be in service in the Niagara Street power house early in March. This will relieve the shortage of power experienced by the company since the embargo was placed by the Canadian Government on the exportation of Canadian-Niagara power to western New York.

In an effort to relieve the congestion at the big industrial plants in North Elmwood Avenue, where almost 12,000 workers board cars between 5:30 and 6 o'clock every night, the company is considering the construction of a substation near this district where passengers can board cars after passing through gates where fare collectors would be stationed. Pending the construction of such a loading station, the company will lay a double-track line in Elmwood Avenue, from Hertle Avenue to the city line. A franchise for this extension was granted at the last municipal election. Construction work will start in the spring. This track extension will be used for storing extra cars to handle the rush-hour crowds from this rapidly growing industrial district.

Among other improvements the company will extend the new Bailey Avenue line from Clinton to Seneca Streets. The line from Broadway to Clinton Street has been in operation about a month. The Bailey Avenue line has also been opened between East Ferry and Genesee Streets. The Broadway line between Jefferson Street and Fillmore Avenue will be rebuilt and improvements will be made in the roadbed of other lines.

$600,000 Spent in Indianapolis

Money Used for Improvement of Lines and for New Equipment

The Indianapolis Traction & Termial Company, Indianapolis, Ind., during the year 1916 spent more than $600,000 in the improvement of its lines and in purchase of new equipment. The 1916 improvements may be grouped into four classes, viz.: Track elevation, flood prevention, down-town re-routing and track construction and rehabilitation. Under the head of track elevation there appears special work at Illinois and South Streets, and on Kentucky Avenue at South and West Streets. At the crossings on South Street the tracks were spread and the crossing improved. Under the head of flood prevention is classed the improvements on Oliver Avenue, Kentucky Avenue, Morris Street, West Michigan Street and West Washington Street, these improvements being of a varied nature and designed to adapt the car system to the flood prevention work being carried on in the city of Indianapolis and to supplement that work. Following the policy of the company to install permanent construction work wherever new paving is required, the company has reconstructed a great deal of track in connection with orders for paving of the part of the street which it occupies. The re-routing of the cars in the down-town district necessitated special work at Market and Alabama Streets, Alabama and Washington Streets, Delaware and Washington Streets, Meridian and Maryland Streets, Indiana Avenue and West Street, and Indiana Avenue and Blake Street. The re-routing also required the building of 625 ft. of double track with granite paving on Alabama Street from Market to Washington Streets and 2400 ft. of double track with granite paving from West to Blake Streets on Indiana Avenue.

Buffalo Strike Award

Verdict in Favor of Company Includes Only Actual Property Damage

Only actual property damage was included in the verdict returned in the Supreme Court of Erie County in favor of the International Railway, Buffalo, N. Y., against the county for alleged failure to protect the company's cars during the street car strike riots in the spring of 1913. The verdict was for the nominal sum of $2,862. The company brought suit for $108,000, which included $14,000 a day loss in receipts during the strike period. The jury returned a verdict of no cause of action on this part of the complaint. An appeal will probably be taken to a higher court by Norton, Penney, Spring & Moore, of counsel for the railway company.

In his testimony before the jury, E. G. Connette, president of the International Railways, declared that nearly all fares collected by the strike-breakers brought to Buffalo to take the places of the striking platform men, were held by the men and not turned over to the company, so that the company received little revenue during the strike period. Counsel representing the company contended that the county was responsible for the company's earnings because of its alleged failure to provide adequate protection, although two regiments of the New York National Guard were doing strike and riot duty. The verdict was referred to briefly in the account of the trial which appeared in the ELECTRIC RAILWAY JOURNAL of Jan. 20, page 131.

Progress on Kansas City Terminal

Station to Be Ready in Sixty Days Involves an Expenditure of $100,000

The new freight terminal for Kansas City, Mo., which is under construction at Fourth and Wyandotte Streets, will be completed in sixty days according to present indications. The site and building will involve an expenditure of $100,000. They will provide the only facilities in the city for the handling of interurban freight and express packages. The small freight depots now maintained by the various lines that enter Kansas City will be abandoned, all but one company, the Strang line, having signed a thirty-year contract to handle their freight and express matter through the Kansas City Interurban Freight Terminal Company, These roads have contracted to supply a minimum annual tonnage of 31,000 tons. The companies that have entered into this contract are the Kansas City, Clay County & St. Joseph Railway; the Kansas City, Kaw Valley & Western Railway; the Kansas City Western Railway and the Kansas City, Lawrence & Topeka Railway. The terminal company is incorporated for $100,000 and the officers are: John H. Rockwell, president; William S. Tuley, vice-president; Adolph J. Meyer, secretary and treasurer.

EXPANSION OF FREIGHT BUSINESS

Already there are indications that other proceedings will be undertaken to expand the freight business by the electric lines of the district and probably to provide connections with the steam roads. There is, it is said, a possibility that such connection can be made within a block or so of the interurban freight station; but if this cannot be accomplished, connections will be arranged for elsewhere, without doubt. Another problem that is being studied is that of deliveries of freight in the cars, as brought to the city by interurban or electric locomotive, to their destination within the city limits.

There are many instances on record, of cars consigned to Kansas City houses, that could be brought to the city limits by interurban, and delivered to the warehouses without disturbing the contents. In practice, these cars must be unloaded at a freight station, and the freight hauled by motor truck or horse-drawn vehicles to the consignee, at great cost and great waste of time. While no announcement of plans can be made now, it is said to be probable that the connection with the belt steam railroad, and the provision for delivering freight cars in the city and suburbs, may both be brought about this year.

Maryland Commission Reports

The Public Service Commission of Maryland on Jan. 19 made public its report to Governor Harrington for the year 1916. The total capitalization of the corporations under the commission's jurisdiction is $1,611,892,725. Transportation Expert Bruce W. Duer calls attention to the fact that during the year all cars in service on the lines of the United Railways & Electric Company, Baltimore, Md., were equipped with improved protecting fenders, automatic wheel guards, proper destination signs and signal bells. He also states that 560 cars of the semi-convertible, open-platform type were converted into modern vestibuled cars.

Under the heading "Accidents" Mr. Duer reports that 146 persons were killed and 8490 were injured on steam and electric railways within the State in 1916. Of the killed, 107 were of the public and 39 were employees. Of the injured 2102 were employees and the remaining 6388 were of the public. On steam roads 78 of the public and 35 employees were killed and 144 of the public and 852 employees were injured. On the electric lines 29 of the public and 4 employees were killed, while 6244 of the public and 1250 employees were injured.

The transportation expert states that the number of motor cars or jitneys in public use in Baltimore decreased materially during the year, but that there has been no decrease in the number of jitneys in the counties.

"Home-Rule" Bill for Chicago

A special legislative committee, headed by Medill McCormick, which has made a survey of the utilities in Illinois presented a proposed "home-rule" bill for Chicago to the State Legislature on Jan. 23. It is intended to restore control over Chicago public utilities to the City Council. The method of exerting this control by the City Council is not specified, although the bill which accompanies the report suggests two schemes. The first of these contemplates control through a commission to be appointed by the Mayor, while the second provides control through the City Council direct, with power vested in it to create a commission or commissions by ordinance. The bill is called a measure to restore home rule to all cities having a population of 200,000 or more, but Chicago is the only city in Illinois with the defined population.

Relief Sought in California

F. W. Webster, general manager of the Fresno (Cal.) Traction Company, discussed the problems of the electric railways in that State in an interview in the Fresno *Republican* of Jan. 3. Mr. Webster said that the electric railroads of California were operating under burdensome and out-of-date laws and that the State Legislature would be requested this session to relieve the companies of some of their obligations so that capital could be induced to invest in electric railways and thereby make needed extensions. He was quoted in part as follows:

"The last year has been most disastrous in earnings of our company, but we, of course, feel that the next year is going to make a great change and through the public sense of justice the electric roads will receive a square deal. Otherwise the future is very dismal indeed. It is true that during the past year we have not earned interest on the investment in this city.

"You cannot secure capital for extensions unless you can show a paying investment or a possibility of making it such. We cannot do this for the local lines or other lines. The electric roads of California will ask for relief from a law passed in 1876 which required the roads to pave between their tracks and on 2 ft. on each side of the tracks. That is asking too much of us under the present conditions, as our earnings are cut and the traffic now goes on our part of the pavement, as cars are stationed at the curbs. We pay 5¼ per cent of gross earnings to the State, and our other taxes bring the total amount paid by us to the public authorities to 12 per cent. We cannot continue to perate under such a burden."

Strike Declared Off.—The strike of motormen and conductors employed by the Allegheny Valley Street Railway, Tarentum, Pa., declared on Aug. 15, 1915, has been called off, according to announcement of the executive committee of the strikers. During the strike the former employees of the company operated jitney buses.

Wheeling Employees Seek Wage Increase.—The union employees of the Wheeling (W. Va.) Traction Company have asked for an increase in wages. They desire 30 cents an hour for the first six months, 32 cents an hour for the second six months, 34 cents an hour for the third six months, and 36 cents an hour after eighteen months continuous service, during the life of the contract.

Gary Franchise Negotiations Fail.—The efforts have failed which were made toward securing a new franchise for the Gary & Interurban Railroad in Gary, Ind., referred to in the ELECTRIC RAILWAY JOURNAL of Jan. 6, page 50. The segregation of the properties and a share in the net profits was proposed to the city in return for the repeal of the present franchise ordinance fixing the local fare at 3 cents.

Nine-Hour Bill in Maine.—A bill has been introduced into the Legislature of Maine which provides that no street railway and no person, firm, corporation or other employer operating a street railway shall require any conductor or motorman to work more than nine hours in any day and if any such conductor or motorman shall work nine hours or less in any day such work shall be performed within eleven consecutive hours.

Hearing on New York Central Improvements on Feb. 14.—Public hearings are to be held commencing on Feb. 14 on the "form of agreement" reached between representatives of the city of New York and the New York Central Railroad for the improvement and electrification of the company's West Side lines in New York, as made public on Jan. 16 and referred to in the ELECTRIC RAILWAY JOURNAL of Jan. 20, page 130.

Cincinnati Commission Approves Steps Taken on Local Matters.—The Rapid Transit Commission of Cincinnati, Ohio, has approved all steps so far taken by the conference committee in revising the street railway franchise and in dealing with the Cincinnati Traction Company. A financial report submitted showed that of the $100,000 appropriated at the beginning of the preliminary work of building there was a balance on hand of $65,089.

Waterfront Bus Line for San Francisco.—On recommendations of the public utilities committee, the Supervisors of San Francisco, Cal., have adopted a resolution accepting the proposal made by the State Harbor Commission to pave a strip adjacent to the sea wall for a length of several miles and to give to the city exclusive right to operate motor buses over the same. Upon the completion of the pavement the city and county are to provide the necessary means of transportation.

$15,000,000 Tunnel for Baltimore.—Representing an outlay of approximately $15,000,000, the Pennsylvania Railroad on Jan. 24 submitted plans for the improvement of its terminal facilities at Baltimore, Md., to Mayor James H. Preston for the consideration of the municipal authorities and the City Council. One of the main features of the plans provides for the construction of twin tubes paralleling generally the present tunnel under the city. No mention is made of electrification of the terminals, one of the points upon which the city has insisted.

Strike Suits Withdrawn.—The Wilkes-Barre (Pa.) Railway moved on Jan. 19 to lift the injunction obtained several months ago against all the striking carmen, many of whom are now back at work. The injunction restrained picketing and prevented the men from interfering with passengers or the service of the company. The company also asked for damages and filed with the injunction claims similar to those in the Danbury hatters' case. According to the terms of the strike settlement as published in the ELECTRIC RAILWAY JOURNAL of Dec. 23, page 1312, the company agreed to stop all court actions, to lift the injunction and to withdraw the claims for damages.

Directory of Public Service Companies of Pennsylvania.—In the State of Pennsylvania, 496 street railways hold charters of incorporation, according to a directory of public service companies in that State just issued by the Public Service Commission. Of these companies, 120 are actually operating their own properties; 250 are operated by other companies holding leases on the properties and lines; 109 have never performed the functions for which they were chartered, and seventeen are "dormant," having ceased to perform their functions as companies. The directory shows 3715 utility companies under charter in the State, including railroad, gas, heat, light, telephone, telegraph companies, etc.

Proposed State Tax for Municipal Railways.—In its annual report the California State Board of Equalization said: "There seems to be no reason why the municipally owned utility should not bear its just proportion of a State tax. It is manifestly unfair for San Francisco and Los Angeles to take over a public utility without paying to the State the amount of taxes which would ordinarily accrue under private ownership. To do so creates a great liability for a deficiency in the State's revenues, and if resort is had to an ad valorem deficiency tax an unwarranted burden is cast upon the people of the State who do not live in the cities concerned. We recommend the enactment of a law by which the municipalities owning and operating public utilities shall be required to report to this board and pay a tax commensurate with the State's other taxpayers."

City Departments Not Permitted to Favor Other Departments.—In a written opinion by the attorney general's office of the State of Washington it is contended "that a city has no power to require one public utility to loan money to another department unless the current rate of interest is charged; that a city has no right to require a utility to furnish free service or service below the usual cost to other utilities or municipal departments; that a city council has no power to appropriate, directly or indirectly, any part of the income or surplus of one utility for the benefit of another utility." The bureau of inspection of public offices had asked the attorney general whether or not it was legal for a municipally-operated utility to receive as a gift from the general fund of a city a contribution for the purpose of providing working capital or for covering a deficit. In direct answer to the question the opinion is quoted: "We know of no provision in the statute which prohibits a municipally-owned public service from receiving a gift from any source. We are of the opinion, however, that the city authorities cannot make such a gift as that referred to in this instance."

Programs of Association Meetings

Arkansas Association of Public Utility Operators

The 1917 convention of the Arkansas Association of Public Utility Operators will be held at Pine Bluff, Ark., on May 16, 17 and 18.

Wisconsin Electrical Association

The annual meeting of the Wisconsin Electrical Association will be held at the Hotel Pfister, Milwaukee, Wis., on March 15 and 16. The program has not as yet been definitely arranged.

American Institute of Electrical Engineers

The dinner-dance of the American Institute of Electrical Engineers will be held at the Hotel Astor, New York, N. Y., on Feb. 16 at 7 p. m. The purpose of the dinner-dance is to provide a popular and informal social function for the entertainment of the members and their guests in attendance at the mid-winter convention of the institute.

Southwestern Electrical & Gas Association

The Southwestern Electrical & Gas Association has chosen Dallas, Tex., as the place for holding its annual convention on April 26, 27 and 28. The program of papers is now being arranged. The Electric Club of Dallas has already begun the work of making arrangements for the entertainment of the delegates. At the last meeting of the club a committee consisting of L. C. Bradley, chairman, W. J. Drury, Fred Slater, W. L. Marshall and H. S. Cooper was appointed to arrange the details of the entertainment.

Financial and Corporate

Blue Sky Laws Upheld

United States Supreme Court Decides That Ohio, Michigan and South Dakota Security Sale Laws Are Constitutional

The so-called blue sky laws of Ohio, Michigan and South Dakota, regulating the sale of securities, were upheld as constitutional by the Supreme Court on Jan. 22 in far-reaching decisions affecting similar laws in twenty-six States. Justice McKenna handed down the opinion of the court, to which Justice McReynolds alone dissented. The Justices admit that such statutes may curb and burden legitimate business, but hold that the interests of legitimate business are not paramount to the police power of States to protect their citizens from fraud. Federal Court injunctions suspending enforcement of the laws are dissolved.

The laws give State authorities, through security commissions or banking superintendents, authority to forbid the sale within State borders of securities which officials believe would result in fraud upon investors. The court said:

"The statutes burden honest business, it is true, but burden it only that under its forms dishonest business may not be done. Expense may thereby be caused and inconvenience, but to arrest the power of the State by such considerations would make it impotent to discharge its functions. It costs something to be governed."

The blue sky laws of Ohio, South Dakota and Michigan all had been held unconstitutional by lower Federal courts, and their enforcement by State officials was enjoined while the officials appealed. Two principal points upon which these acts were declared void and non-enforceable in the lower courts were: That they unduly burdened interstate commerce, of which stocks, bonds and other securities were declared to be instrumentalities, and that the laws exceeded the States' police powers of local supervision.

The States, however, contended that the laws prevented fraud only, and, unlike the original Kansas type of blue sky legislation, did not attempt to prevent unwise investments. Also, they contended that the laws did not restrict or burden interstate commerce, applying only to sales within the States, and in preventing frauds they were normal and wise exercise of police power.

Another San Francisco Circular

Statement by Committee Headed by J. H. Hammond Announces Reasons for Opposing Reorganization

The committee, of which John H. Hammond of Brown Brothers & Company, New York, N. Y., is chairman, has issued another circular to the holders of the 4 per cent bonds of the United Railroads, San Francisco, Cal., and to the holders of deposit certificates issued for the bonds under the reorganization plan dated Sept. 22.

It is set forth in the circular that the surplus net earnings over the total interest requirements for the underlying, as well as the 4 per cent bonds, would, under usual conditions, make a readjustment or reorganization unnecessary. It is stated that reorganization in this case is caused by other than insufficient income. Sacrifice of capital by the 4 per cent bondholders required by the present plan is declared to be unnecessary.

The Hammond committee announces that it had opposed the reorganization, namely, the expiring franchises, and the lessly large sacrifice by the bondholders which it represents without adequate compensation; failure of the plan to provide for the difficulties which form the occasion for the reorganization, namely, the expiring franchises, the necessity of refunding the debt and properly refinancing the company. With respect to the matter of financing, it is claimed that the plan does not provide for extensions, improvements and other capital purposes, such as are constantly necessary in a rapidly growing community.

Annual Report

Interborough Consolidated Corporation

The income statement of the Interborough Consolidated Corporation, New York, N. Y., for the year ended Dec. 31, 1916, follows:

Surplus, Dec. 31, 1915	$1,834,090
Income:	
Dividends on Interborough Rapid Transit stock (20 per cent)	$6,782,560
Other dividends and interest	122,876
Profit on purchase for retirement of $2,500,000 of Interborough-Metropolitan ten-year 6 per cent collateral gold notes	25,920
Total	$6,931,356
	$8,765,446
Deductions:	
Interest on $67,825,000 of Interborough-Metropolitan 4½ per cent collateral trust bonds	$3,052,125
Interest to July 1, 1916, on $2,500,000 of Interborough-Metropolitan 6 per cent collateral gold notes	75,000
Interest at 4½ per cent on $2,000,000 advance from Bankers Trust Company, from July 1, 1916	46,000
Sinking fund on above 4½ per cent bonds	300,000
Sinking fund on above 6 per cent notes	150,000
Administration and general expenses	43,619
Taxes	128,395
Total	$3,795,139
Surplus available for dividends	$4,970,307
Dividends on preferred stock, 6 per cent	2,774,430
Net surplus	$2,225,877
Appropriation for retiring above 6 per cent notes in excess of sinking fund accruals	350,000
Surplus balance, Dec. 31, 1916	$1,875,877

The gross revenue of the subsidiary subway and elevated lines for the six months' period ended Dec. 31, 1916, notwithstanding the strike, increased approximately $2,193,000. The earnings on the surface lines fell off on account of the strike, but they are said to be gradually nearing normal.

The Interborough-Metropolitan Company ten-year 6 per cent collateral gold notes, dated Jan. 1, 1915, of which there were $2,500,000 outstanding on Jan. 1, 1916, were retired during the year. For that purpose the company secured on July 1, 1916, from the Bankers Trust Company, an advance of $2,000,000 for nine months at 4½ per cent interest, the balance required for the purpose of the retirement being taken from surplus cash.

Under authority of a resolution of the board of directors whereby the sum of $300,000 was directed to be set aside out of the annual income of the company for the acquisition of the 4½ per cent collateral trust bonds of the company as a sinking fund, there was acquired in the open market bonds to the amount of $2,510,000.

During 1915 a favorable opportunity seemed to be presented to bring to a conclusion the protracted litigation arising over the funds in the hands of the Metropolitan Street Railway and the New York City Railway receivers. After six months' negotiations, matters were brought to such a state that on Feb. 15, 1916, an order was entered providing for the discharge of the receivers, and the receivers were actually discharged on March 24. As a result, the New York Railways and its affiliated companies became entitled to recover approximately $4,200,000. Of the fund thus acquired, $950,000 was employed in carrying off a real estate mortgage upon fee property of the New York Railways and $650,000 in paying a general obligation contracted by the Metropolitan bondholders' reorganization committee.

Fiscal Years to End Dec. 31

The Massachusetts Public Service Commission has ordered returns from utilities subject to its jurisdiction to be filed for fiscal years ending Dec. 31 instead of June 30, in accordance with action already taken by the Interstate Commerce Commission and by other State commissions. Returns for the year ended Dec. 31, 1916, are due March 31, 1917.

The State Public Utilities Commission of Illinois has issued an order permitting the utilities of the State to change the date of the annual report from a termination on June 30 to a termination on Dec. 31.

Electric Railway Statistics

Returns for October, 1916, Compared with Those for the Corresponding Month of 1915, Show Menace of Growing Expenses

A comparison of electric railway statistics for October, 1916, with figures for the corresponding month of 1915, made by the information bureau of the American Electric Railway Association, indicates a menacing growth in the expense burden. This is further intensified by the unsettled labor conditions in New York City. Indications point, however, to an encouraging improvement in the business conditions of the Western district. Data for October, representing 7259 miles of line of companies scattered throughout the country, show a decrease in operating revenues of 1.15 per cent, an increase in operating expenses of 5.58 per cent and a decrease in net earnings of 10.93 per cent. Data representing 6150 miles of line indicate an increase in the amount of taxes paid of 5.32 per cent, and a decrease in operating income of 14.75 per cent.

Of the three groups shown in the accompanying table, data for the Eastern, represented by 4359 miles of line or approximately 60 per cent of the total mileage, show a decrease in operating revenues of 3.64 per cent, an increase in operating expenses of 6.35 per cent and a decrease in net earnings of 17.65 per cent. Returns representing approximately 80 per cent of this mileage show an increase in the amount of taxes paid of 7.11 per cent and a decrease in operating income of 22.43 per cent. Though labor conditions in New York City in this month were constantly improving, they were still somewhat unsettled and their effect upon the earnings and expenses of the lines in the metropolitan district and consequently upon those of the Eastern district was still somewhat felt.

The Southern group, represented by 760 miles of line, is apparently beginning to feel the effects of the increasing cost of labor and materials. Though the earnings in October increased 2.22 per cent, an increase in operating expenses of 5.70 per cent caused the net earnings to decrease

REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR OCTOBER, 1916

	Companies Not Reporting Taxes		Companies Reporting Taxes	
	Amount	Per Cent Increase	Amount	Per Cent Increase
*United States**				
Operating revenues	$16,258,463	†1.15	$15,219,913	†1.73
Operating expenses	10,285,255	5.58	9,643,522	5.08
Net earnings	5,973,208	†10.93	5,576,391	†11.64
Taxes	....	....	1,030,076	5.32
Operating income	....	....	4,546,315	†14.75
Operating ratio, per cent:				
1915	63.26	....	63.36	....
1916	59.23	....	59.25	....
Miles of line represented	7,259	....	6,150	....
*Eastern District**				
Operating revenues	$10,778,413	†3.64	$10,445,889	†4.06
Operating expenses	6,945,155	6.35	6 744,721	5.95
Net earnings	3,833,258	†17.65	3,701,168	†18.21
Taxes	....	....	692,208	7.11
Operating income	....	....	3,008,960	†22.43
Operating ratio, per cent:				
1915	64.44	....	64.57	....
1916	58.38	....	58.45	....
Miles of line represented	4 359	....	3.759	....
*Southern District**				
Operating revenues	$813,235	2.22	$504,674	1.50
Operating expenses	478,808	5.70	289.767	4.84
Net earnings	334,427	†2.40	214.907	†2.68
Taxes	....	....	40,752	†3.59
Operating income	....	....	174,155	†2.46
Operating ratio, per cent:				
1915	58.88	....	57.42	....
1916	56.93	....	55.59	....
Miles of line represented	760	....	506	....
*Western District**				
Operating revenues	$4,666,815	4.49	$4.269 350	4.14
Operating expenses	2,861,292	3.76	2,609,034	2.94
Net earnings	1,805,523	5.68	1,660,316	6.08
Taxes	....	....	297,116	2.61
Operating income	....	....	1,363 200	6.87
Operating ratio, per cent:				
1915	61.31	....	....	....
1916	61.75	....	....	....
Miles of line represented	2,140	....	1,885	....

†Decrease.

*Groupings are as follows: *Eastern District*—East of the Mississippi River and north of the Ohio River. *Southern District*—South of the Ohio River and east of the Mississippi River. *Western District*—West of the Mississippi River.

2.40 per cent. Data for companies represented by approximately 85 per cent of such mileage indicate a slight decrease in the amount of taxes paid and one of 2.46 per cent in the operating income.

Returns for the Western district show an increase in operating revenues of 4.49 per cent, in operating expenses of 3.76 per cent and in net earnings of 5.68 per cent. Data for companies represented by approximately 90 per cent of this mileage show an increase in the amount of taxes paid of 6.08 per cent, while the operating income increased 6.87 per cent.

The operating ratio is growing, that of the United States in October having increased from 59.23 in 1915 to 63.26 in 1916. Similar increases are apparent in the Eastern and Southern districts, while the Western shows a slight decrease, though its operating ratio is the highest of all.

Progress of California Utilities

Electric Railway Showing Comparatively Poor—Details of New Financing During Year

The year 1915 was the most prosperous year in the history of public utilities in California, although the electric railways in the State were not so fortunate. The total operating revenue of all the utilities, including the entire business of the interstate railroads, which was not segregated by them, was $384,617,734. The operating expenses amounted to $249,303,932, leaving net operating revenue of $135,313,802 for the year. These figures are for the calendar year ended Dec. 31, 1915, for all public utilities except the transportation lines, and for the fiscal year ended June 30, 1915, for steam railroads and electric railways. They are taken from the report of the California Railroad Commission for the year ended June 30, 1916, just available.

Statistics compiled by the commission for each class of utility show that the net operating revenue in each case was greater in 1915 than in 1913 or 1914 with the exception of steam railroads and electric railways. In the case of the former, however, there has lately been a large increase in net operating revenue, so that the record for the last fiscal year will show up better than the one for the year preceding. For electric railways, however, the outlook seems not so favorable. The operating revenue of $33,869,392 for the year ended June 30, 1915, was a decrease from $36,108,649 in 1914 and $36,077,841 in 1913. The operating expenses of $23,250,018 in 1915 were a slight decrease from those of $23,986,694 in 1914, and were greater than those of $22,983,578 in 1913, while the net operating revenue for 1915 was only $10,619,373 as compared to $12,121,955 in 1914 and $13,094,262 in 1913. The report of the commission states that the decrease in net operating revenue was no doubt caused to a considerable extent by jitney buses, but the commission formerly denied that it had any jurisdiction over such carriers.

Under a recent court ruling, however, the commission must control their rates and service when the jitneys are not operated solely within a municipality.

During the fiscal year ended June 30, 1916, the commission passed upon $242,523,095 of securities desired to be issued by public utilities, as compared to $134,271,268 during the preceding year. Of this total $231,644,870 was granted. Of the securities authorized 65.56 per cent represented stocks, 27.83 per cent bonds, 4.24 per cent notes and 2.37 per cent certificates of indebtedness. During the last fiscal year the electric railways made application for new securities totaling $28,713,194, of which $6,973,102 was authorized, including $126,000 of stock, $4,184,000 of bonds and $2,663,102 of notes. An analysis of the purposes for which new securities were authorized shows that for electric railways the $126,000 of stock was for additions and betterments. Bonds were issued as follows: Additions and betterments, $405,000; refunding, $125,000, and collateral, $3,654,000. Of the note issues $472,873 was for additions and betterments, $2,129,209 for refunding and $61,020 for collateral. To consider the new securities authorized as a whole, there were $1,003,873 for additions and betterments, $2,254,209 for refunding and $3,715,020 for collateral.

Jitney Securities Authorized

The Public Service Commission for the Second District of New York has established a precedent by authorizing the Carpenters' Bus Line Company of Watertown, a jitney line, to issue and sell at par 320 shares of its common stock, the proceeds to be used in the purchase of equipment and general development.

American Railways, Philadelphia, Pa.—Bioren & Company and Newberger, Henderson & Loeb, Philadelphia, Pa., announce that they have purchased $1,750,000 new 5 per cent collateral trust bonds of the American Railways, issued for the purpose of retiring part of the $2,500,000 of Scranton gold trust certificates, which the American Railways elected to purchase at 102½ and interest on March 1. Holders of the certificates may deposit same and receive in exchange for each maturing bond an interim certificate for one of the new bonds of the American Railways and $50 in cash, together with $25, the amount of the April 1 coupon.

Chicago City & Connecting Railways Collateral Trust, Chicago, Ill.—Harrison B. Riley, chairman of the board of the Chicago City & Connecting Railways Collateral Trust, has issued a statement reviewing the affairs of that company and dealing with the investigation of transit affairs in that city by the Chicago Traction & Subway Commission, the report of which body has been reviewed at length previously in the ELECTRIC RAILWAY JOURNAL. In that part of his statement dealing with the direct affairs of his company Mr. Riley said in part: "It is a matter of congratulation that the trust has been able to pay the full preferred dividend accruing during the last half of the year 1916. This is due to an increase of 10 per cent in the gross earnings of the Chicago surface lines during the first ten months of the fiscal year, and also to the economical management of these properties. The operating ratio is materially lower than last year. It must be remembered, however, that the continuance of the present situation will depend upon a normal increase in gross receipts, and the ability to maintain a favorable operating ratio."

Georgia Railway & Power Company, Atlanta, Ga.—When the three financial petitions of the Georgia Railway & Power Company and the Georgia Railway & Electric Company came up for hearing before the State Railway Commission on Jan. 16, after having been postponed for a week, Marion Jackson, representing the opposition, moved for another postponement. This the commission denied. The sessions of the commission on Jan. 16 completed the hearings upon the petition of the Georgia Railway & Power Company to issue scrip, and the petition of the Georgia Railway & Electric Company to issue bonds. The petition of the Georgia Railway & Power Company to issue bonds will be taken up when the commission resumes the hearing. E. H. Rollins & Sons, Boston, Mass., are offering at 93 and interest, to yield about 5.45 per cent, $500,000 of first and refunding mortgage 5 per cent bonds of the Georgia Railway & Power Company.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—The Indianapolis Traction & Terminal Company has issued $125,000 of 5 per cent car trust certificates, Series E, dated Dec. 1, 1916, and due in semi-annual installments from June 1, 1917, to Dec. 1, 1926, the amounts due on Dec. 1, 1918, 1920, 1922, 1924 and 1926 being $7,000, all other installments $6 000. Interest is payable in July and December at the office of the Pennsylvania Company for the Insurance on Lives & Granting Annuities, Philadelphia, Pa., the trustee. The certificates cover twenty-five double-truck closed motor cars complete, operated under lease that has been assigned by the Indianapolis Traction & Terminal Company to the trustee.

Niagara Gorge Railroad, Niagara Falls, N. Y.—Mrs. Melodia Blackmar Jones, widow of the late Capt. Joseph T. Jones, president of the Niagara Gorge Railroad, Niagara Falls, N. Y., was elected a member of the board of directors of the company, at a stockholders' meeting. She will succeed Captain Jones. Other directors elected were Bert L. Jones, George C. Riley, Whitney G. Case, William H.

Hotchkiss, C. M. Bushnell, William W. Riley, C. M. Whitthauser, O. E. Foster, K. B. Hansard, Buffalo, and C. L. Corliss, Tonawanda, N. Y. The new board of directors will meet on Feb. 2 to elect officers and Mrs. Jones will probably be elected president of the company to succeed her husband.

Northern States Power Company, Chicago, Ill.—By action of the board of governors of the New York Stock Exchange the issue of $18,000,000 of first and refunding, twenty-five year, Series A, 5 per cent bonds of Northern States Power Company, dated April 1, 1916, has been listed on the exchange.

Sapulpa Electric Interurban Railway, Sapulpa, Okla.—The Salpulpa Electric Interurban Railway has been incorporated in Oklahoma with a capital stock of $200,000 as the successor to the Sapulpa & Interurban Railway, a 12-mile electric railway bought in under foreclosure by the bondholders on Sept. 9, 1916.

Standard Gas & Electric Company, Chicago, Ill.—H. M. Byllesby & Company, Inc., Chicago, Ill., are offering for subscription at 96 and accrued interest to net 6⅜ per cent, $200,000 of 6 per cent gold notes of the Standard Gas & Electric Company dated Oct. 1, 1915, and due Oct. 1, 1935. The notes are in coupon form in the denomination of $1,000, $500, $100 and $50. The total authorized issue is $15,000,000. Of this amount there are now outstanding $6,914,250 of the notes, this sum including the present offering.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.—Through the Empire Trust Company, St. Joseph, Mo., the St. Joseph & Savannah Interurban Railway has called for payment at 102½ and interest on April 1, 1917, all its first mortgage bonds. The company will be merged with the St. Joseph Railway, Light, Heat & Power Company and proceeds for the redemption of the bonds were secured by a sale of first and refunding 5 per cent bonds of the St. Joseph Railway, Light, Heat & Power Company.

Texas Traction Company, Dallas, Tex.—J. F. Strickland, Dallas, Tex., president of the Texas Traction Company and the Southern Traction Company, which are to be consolidated according to an agreement already reached, has returned to Dallas from Chicago, where he was called in connection with final details of the consolidation plans. Mr. Strickland said the consolidation agreement would be referred to the stockholders of the two lines at a meeting to be held in Dallas at an early date. Arrangements for the consolidation were well under way previously, but had to be abandoned for the time being owing to the discontinuance of the business of one of the financial houses participating.

West End Street Railway, Boston, Mass.—The West End Street Railway has sold to Curtis & Sanger, F. S. Mosely, and Blodget & Company, Boston, Mass., $2,700,000 of 5 per cent five-year bonds, callable in August, 1919, at 102 and interest. The bankers are offering the bonds at 101¾. The proceeds of the new issue are to be used to retire a like amount of bonds due on Feb. 1, 1917, as noted in the ELECTRIC RAILWAY JOURNAL of Jan. 20, page 136.

Wheeling (W. Va.) Traction Company.—It is stated that the Wheeling Traction Company proposes to issue $40,000 of 5½ per cent equipment trust certificates for the purchase of eight new pay-enter cars to cost $43,698. The certificates are to mature serially over a period of five years.

Worcester (Mass.) Consolidated Street Railway.—The Worcester Consolidated Street Railway has filed a petition with Massachusetts Public Service Commission to issue $240,000 of 4½ per cent gold bonds in order to retire an issue of $200,000 of twenty-year 4½ per cent mortgage bonds of the Worcester & Blackstone Valley Street Railway and $40,000 of bonds of the Uxbridge & Blackstone Street Railway assumed by the Worcester Consolidated Street Railway when these companies were taken over. The Worcester Consolidated Street Railway has also petitioned the commission to be allowed to cancel 33,750 of its total of 69,260 common shares, par $100, and issue 45,000 shares of first preferred stock, cumulative at rate of 5 per cent per annum.

Dividends Declared

Bangor Railway & Electric Company, Bangor, Me., quarterly, one-half of 1 per cent, common.

Brazilian Traction, Light & Power Company, Toronto, Ontario, quarterly, 1 per cent, ordinary.

Cities Service Company, New York, N. Y., monthly, one-half of 1 per cent, common and preferred; one-half of 1 per cent, common, payable in common stock.

Commonwealth Power, Railway & Light Company, Grand Rapids, Mich., quarterly, 1½ per cent, preferred; quarterly, 1 per cent, common.

Grand Rapids (Mich.) Railway, quarterly 1¼ per cent, preferred.

Lehigh Valley Transit Company, Allentown, Pa., quarterly, 1¼ per cent, preferred.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., quarterly 1½ per cent, preferred.

Monongahela Valley Traction Company, Fairmont, W. Va., quarterly, 1¼ per cent, preferred.

Philadelphia (Pa.) Rapid Transit Company, $1.25.

Public Service Investment Company, Boston, Mass., quarterly, 1½ per cent, preferred.

Railway & Light Securities Company, Boston, Mass., 3 per cent, preferred; 3 per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

BATON ROUGE (LA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov., '16	$18,680	*$8,527	$10,153	$3,540	$6,613
1 " " '15	17,671	*8,946	8,725	2,204	6,521
12 " " '16	209 545	*102,128	107,417	41,623	65,794
12 " " '15	189,924	*109,375	80,549	25,823	54,726

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

1m., Nov., '16	$8,507	*$9,769	†$1,262	$1,116	†$2,378
1 " " '15	7,872	*7,763	109	1,103	†992
12 " " '16	121,971	*108,246	13,725	13,278	447
12 " " '15	115,133	*96,205	18,928	13,525	5,403

CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m., Dec., '16	$1,570,819	$20,310	$1,550,509	$314	$1,550,195
1 " " '15	532,195	17,789	514,406	40,833	473,573
12 " " '16	10,110,342	239,389	9,870,953	258,961	9,611,992
12 " " '15	4,479,800	172,856	4,306,944	490,000	3,816,944

DALLAS (TEX.) ELECTRIC COMPANY

1m., Nov., '16	$181,900	*$109,220	$72,680	$40,695	$31,985
1 " " '15	161 525	*98,789	62,736	34,067	28,669
12 " " '16	1,959,837	*1,205,992	753,845	446,828	‡326,359
12 " " '15	1,846,739	*1,114,800	731,939	402,090	329,849

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.

1m., Nov., '16	$73,859	*$38,362	$35,497	$9,622	$25,875
1 " " '15	71,405	*33,823	37,582	8,715	28,867
12 " " '16	820,296	*440,086	380,210	107,245	272,965
12 " " '15	709,292	*382,517	326,775	105,163	221,611

EL PASO (TEX.) ELECTRIC COMPANY

1m., Nov., '16	$99,883	*$56,104	$43,779	$5,269	$38 510
1 " " '15	93,481	*44,009	49,472	4,187	45,285
12 " " '16	1,094,844	*645,869	448,975	57,972	391,001
12 " " '15	968,805	*517,508	451,297	50,378	400,919

GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.

1m., Nov., '16	$170,144	*$106,885	$63,259	$36,824	$26,435
1 " " '15	168,260	105,554	62,706	36,710	25,996
12 " " '16	1,931,555	*1,232,696	698,859	438,731	260,128
12 " " '15	1,965,151	*1,202,237	762,914	432,921	329,993

HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.

1m., Nov., '16	$26,089	*$14,468	$11,621	$5,241	$6,380
1 " " '15	22,845	*12,909	9,936	5,523	4,413
12 " " '16	323,507	*183,470	140,037	64,197	75,840
12 " " '15	271,259	*159,269	111,990	66,601	45,389

JACKSONVILLE (FLA.) TRACTION COMPANY

1m., Nov., '16	$48,375	*$35,394	$12,981	$15,508	†$2,527
1 " " '15	49,250	*35,856	13,394	14,725	†1,331
12 " " '16	618,511	*422,330	196,181	183,091	13,090
12 " " '15	614,092	*430,540	183,552	176,350	7,202

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

1m., Nov., '16	$731,630	*$432,984	$298,646	$184,682	$113,964
1 " " '15	643,822	*403,103	240,719	182,573	58,146
12 " " '16	8,018,193	*5,092,698	2,925,495	2,210,477	715,018
12 " " '15	7,577,430	*4,755,539	2,821,891	2,175,368	646,583

SAVANNAH (GA.) ELECTRIC COMPANY

1m., Nov., '16	$74,794	*$46,031	$28,763	$23,706	$5,057
1 " " '15	66,448	*43,138	23 310	23,121	189
12 " " '16	814,900	*548,318	266,582	282,098	†15,516
12 " " '15	796,988	*519,795	277,193	278,583	†1,390

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*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

International Railway Attacked

Unusually Heavy Fall of Snow and Consequent Delays Seized Upon for Newspaper Campaign Against Company

Attacks which have been made upon the International Railway of Buffalo, N. Y., and its officers and directors during the last few weeks by a large afternoon daily newspaper have been repudiated by municipal and State authorities. The Buffalo City Council refused to approve the application of the Commissioner of Public Health, who recommended the enactment of a ludicrous health code which would govern sanitary conditions in the company's city cars. In its campaign the paper took advantage of traffic delays on all city lines caused by unusually heavy falls of snow and other abnormal weather conditions. The charges, however, have apparently had little effect upon the public because of the company's policy of giving the widest newspaper and other publicity to the causes for traffic delays, etc.

COMPANY ASKS FOR CRITICISMS

On the second day of the campaign against it the railway published a large display advertisement in the daily newspapers urging the public to send constructive criticism to President Connette, personally, and in other advertisements causes of traffic and other delays were given and some newspapers published lengthy news articles containing favorable interviews with E. J. Dickson, vice-president, and other officers of the company in which all of the various charges made against the company were answered and the public was asked for their support and co-operation in making suggestions for improvements in service.

Urged by this newspaper, the Commissioner of Public Health drafted a code of health laws which provided for the arrest of all platform men in charge of overcrowded street cars; that every passenger more than six years old must be provided with at least 4 sq. ft. of floor space; that the temperature in cars at all times must be at least 50 deg. Fahr., that the standing room in all cars shall be limited to one-half its seating capacity and that 350 cu. ft. of fresh air shall be provided for each passenger each hour. When the code was presented to the City Council it was suggested that it be placed on the table. This is considered as tantamount to its rejection as unfair to the company.

COMPANY IMPROVEMENTS

President Connette told the Buffalo correspondent for the ELECTRIC RAILWAY JOURNAL that never before has the company been making more active efforts to improve service and traffic conditions on its Buffalo lines. Miles of new copper wire were strung during the fall so as to prevent wire breakage during the winter storms, new car lines have been extended in several sections of the city, the new Bailey Avenue line has been placed in partial operation so as to handle employees at several East Side industries; new cars have been bought and placed in operation and other old cars have been rebuilt so as to improve the rolling stock; hundreds of additional platform men have been employed to handle rush-hour loads more efficiently; more frequent schedules are being maintained on all lines and numerous other improvements have been made within the last few months to improve service and traffic conditions.

Mr. Connette has directed that special signs be displayed on all cars leaving the industrial district in North Elmwood Avenue so that these extra cars will be for the sole use of employees of these plants. In an effort to relieve congestion on Main Street between Seneca and Allen Streets during the evening rush hour, the company will lay double tracks in Franklin Street between Chippewa and Allen Streets, and many lines now using the city's main traffic artery will be diverted through a parallel street. A franchise for the Franklin Street extension was approved at the last municipal election.

In replying to the complaint of insufficient heat during cold weather, Mr. Connette in a signed statement to the public says:

"Until March 1, when the new steam turbine is installed in the Niagara Street power station, the company will keep one point of heat turned on at all times, except during the peak load when it will be impossible. Three points of heat on three cars requires enough energy to operate two cars and during the rush hour the movement of cars, we believe, is more important. After the power shortage is relieved we will keep one point of heat turned on, and more, as the weather warrants. One point of heat will raise the temperature in a car about 25 deg."

An inspector will be placed in each carhouse by N. H. Brown, general superintendent of transportation, to supervise the cleaning of all cars. Each carhouse is now in charge of a foreman, who has charge of the cleaning, inspection and repairs and whose duty it is to see that cars are properly cleaned and kept in repair, but in order to facilitate this work Mr. Brown will employ an additional inspector at each carhouse.

On Jan. 23 the informal complaints of twelve residents of Buffalo to the Public Service Commission were consolidated by that body into one formal complaint, and it was announced that following a survey of conditions in Buffalo by Charles R. Barnes, electric railway inspector of the commission, public hearings will be held by the commission.

The company has issued for general distribution several different pamphlets setting forth its position and answering the questions directed at it in criticism of its service.

Increase in Business in Kansas City

A Pleased Public Responds to Company's Efforts with Liberal Patronage

Officials and employees of the Kansas City (Mo.) Railways have been pleased to note the gain of about 7 per cent in business during the ten and a half months since the Kansas City Railways succeeded the Metropolitan Street Railway. Although the community has grown, this alone would not account for the gain of almost $500,000 in receipts over the same period of the previous year, for the number of automobiles in the city has almost doubled. The only feasible explanation seems to be in the fact that the public is a pleased public. For the first time in years the street railway has not come in for any general condemnation by the public. The present management has considered the public demands openly, and where these demands had a measure of justice they have been granted. Since the present management took hold there have been no secrets. There have been the usual number of private conferences, but the public has always been answered truthfully, and every complaint has been honestly investigated. If a request could not be granted the real reason was given. All this has brought about a more kindly feeling toward the company than ever existed before—a kindly feeling that shows up in the dollars poured into the company's treasury a nickel at a time.

Throughout the year the people have been told that the company was spending more than $100,000 monthly among Kansas City business concerns; that nearly $300,000 monthly went for labor; that $75,000 monthly was spent for fuel, and that more than $1,000 a month went to the city water department for water alone. Added to this the people were told from time to time of the arrival of new cars, a total of seventy-five having been purchased at a total cost of $450,000. When the year was finished the people were told through the newspapers that 9.01 miles of new extensions had been built, and that 16.71 miles of old track had been reconstructed at a total cost of more than $1,000,000.

The management feels that it is partly the doing of these things that brought a more kindly feeling and helped to increase the business. Every piece of literature put out for the purpose of building up travel told of these things.

In discussing the future at the beginning of the new year, President Philip J. Kealy said:

"It has been a splendid ten and a half months. In that time we have kept in advance of the public, but each of us should remember that the public is always on the jump, and if we go to sleep the public will catch up with us. So let's keep on keeping ahead."

Spokane Traffic Case Decided

Owl Service to Continue—One-Man Cars Sanctioned—Consolidation Suggested in the Interest of Economy

The Public Service Commission of the State of Washington has decided that the Washington Water Power Company and the Spokane & Inland Empire Railroad, Spokane, shall continue the owl car service on their lines and that before they operate one-man cars in Spokane they shall submit to the commission for approval lists of routes on their respective lines upon which they desire to operate such cars and that such cars be inspected and approved by the commission before operation. The decision to this effect was rendered by the commission on Jan. 10 in the case of the City of Spokane against the companies mentioned, which came up for hearing on June 9.

CITY'S COMPLAINT

The city alleged in substance that for a long period of time the companies operated owl cars from the center of the city at about 12.30 a.m.; that many persons patronized these cars and to have such service discontinued would be a serious inconvenience; that the respondents were reconstructing cars and operating them with one employee; that there were a number of complaints that the cars were dangerous and the service inadequate and that the public was not properly protected in the operation of the cars.

COMPANIES' DENIAL

The companies denied that it would be a serious inconvenience to the traveling public to have the owl car service discontinued; that the operation of the one-man car was not dangerous or the service inadequate, and that the public was properly protected in the operation of the cars. They also pointed out that the construction and operation of their lines had not been confined to the business and thickly settled portion of the city, but had been extended to the suburbs and into thinly settled districts and that in consequence of the marked decrease in patronage due particularly to the increased use of the motorcycle, private automobile and competition of the jitney, the lines were operated at a loss and that the conditions affecting transportation in Spokane were such that they were compelled to resort to every possible means of effecting economy and reducing the cost of conducting transportation.

OPINION OF COMMISSION

In its opinion the commission said that the testimony in the case showing the financial condition of the companies reflected the true condition. It was not reasonable to presume that the stockholders would long continue to operate properties in which they not only did not receive any return on their investment, but actually suffered a loss. If no relief were found from such conditions "the trolley will come down and the rails will come up." This would be especially true in outlying districts and the commission did not know of any power that it possessed "to compel a public service company to continue to discharge its functions to the public under such conditions." With this condition in mind the commission realized the necessity of using its efforts to preserve to the public a reasonably safe and efficient service without unduly throttling the activities of the carriers in their efforts to operate their systems with the greatest economy. With reference to the owl cars the opinion of the commission was that this service could not well be discontinued without serious inconvenience to a considerable number of patrons, and that to discontinue it would result in only a comparatively small saving to the companies in operating expenses. On that account it felt that the service should be continued. With reference to the near-side stop or one-man cars the commission was of the opinion that the one-man cars could be operated with greater convenience to the public and in some respects greater safety than the cars having a rear entrance and stopping on the far side of a street; and that where cars were not too large and the traffic not too congested they could be operated with reasonable safety and convenience to the public with one man. The commission felt, however, that all cars so used should be first approved by the commission and operated on designated routes.

CONSOLIDATION SUGGESTED

On account of the large area covered by the city of Spokane as compared with the population, the commission suggested to the respondent companies the desirability of a consolidation of the two railways. The commission said that if the consolidation could be accomplished no doubt quite a saving in overhead expenses could be brought about with accruing advantages to the public in service.

B. R. T. Adopts Courtesy Code

New Standard Code of Phrases Expected to Simplify Conductor's Job and Promote Pleasant Relations with Passengers

The surface transportation department of the Brooklyn (N. Y.) Rapid Transit System has adopted a standard courtesy code for surface conductors' and motormen's use in dealing with the public on the cars. The bulletin containing the new code explains that the phrases necessary in dealing with passengers on the cars have been reduced to the smallest possible number, and also that each phrase is expressed in the shortest and simplest language possible. It is pointed out to the employees that by the use of such phrases the public will understand better the necessary requests and explanations which have to be made to them on the cars, and that the conductor who knows the right thing to say at the right time is at a great advantage in the efficient performance of his duties over the conductor who has to stop and think up the phrases in which a given request or explanation should be presented.

The code is divided into four subjects for surface conductors: Cash fares, transfers, protecting passengers when boarding and alighting, and directing passengers on cars, and one subject for surface motormen, comprising the phrases for use in dealing with passengers who are boarding or alighting from the front platform.

Beginning Jan. 27, one of these subjects will be taken up each week in the regular weekly efficiency bulletins of the surface transportation department and the employees will be required to learn during the ensuing week the phrases relating to the subject so presented, and start using them on the cars at once.

The elements of courtesy in the code are presented by three phrases: "Please" when a request is to be made of passengers, or directions given to them; "Excuse me" when a conductor is required to disturb a passenger in a car in any way, and "I am sorry" when a request or a desire of a passenger has to be denied. It is explained that these three phrases will carry the employees through almost any situation that may occur, and they are therefore fundamental in the code.

Missouri-Illinois Fares

I. C. C. and I. T. S. File Motions for Dismissal of Fare Injunction Proceedings

Motions requesting that the United States District Court dismiss the injunction suit filed against them on Dec. 27 by the City Counselor asking that the Illinois Traction System lines be restrained from raising the fare between St. Louis, Mo., and the so-called tri-cities in Illinois from 5 to 10 cents were filed on Jan. 17 by the Interstate Commerce Commission and the Illinois Traction System. Former Governor of Missouri Joseph W. Folk, its counsel, signed the motion of the Interstate Commerce Commission. The motion declares that the Illinois Traction System is a corporation engaged in interstate commerce and as such is subject to the Interstate Commerce Commission by federal act, and that any contract between it and the city, whether by ordinance or otherwise, is subordinate to the powers of the commission. It further states that the District Court has not the jurisdiction to restrain the collection of published interstate rates approved by the commission. The District Court has not yet had any hearings on the injunction suit. The 10-cent fare is now being charged.

Increased Fares Proposed

Schenectady Railway Files Notice of Increase for Its Schenectady-Troy and Schenectady-Saratoga Divisions

The Schenectady (N. Y.) Railway has filed notice with the Public Service Commission of the Second District of New York that it intends to increase fares 5 cents each way on two of the company's lines, the Schenectady-Troy division and the Schenectady-Saratoga division. The increased tariff is to take effect on Feb. 16. The sale of commutation books for travel between Ballston Spa and Schenectady, Ballston Lake and Schenectady, and Troy and Schenectady will be continued at present rates. The increased rates are to be brought about by increasing the 5-cent zones from five to six on the Schenectady-Troy division, making the one-way fare between these cities 30 instead of 25 cents; increasing the 5-cent zones from seven to eight on the Schenectady-Saratoga division, an increase from 35 cents to 40 cents, one way. The company contends among other things that its net income has fallen off until it has reached a point where it is insufficient to maintain the integrity of the company's investment, and is inadequate to enable the company to comply with the requirements of the public service law in regard to providing a fund to care for depreciation and contingencies.

Answers Complaints on Heating

The Southwest Missouri Railroad, Webb City, Mo., has reprinted in pamphlet form part of the testimony presented at hearings before the Public Service Commission for the First District of New York, on the subject of car heating, held during October and November, 1909. The commission had previously issued a regulation that all cars between Oct. 15 and April 15 should be heated to a temperature of not less than 45 deg. or more than 65 deg. Fahr., unless the company was temporarily prevented from doing so by storm, accident or other controlling agency for which it was not responsible, and that a thermometer should be carried in each car displayed conspicuously so that the temperature could be read. At the hearings which followed a number of the New York and Brooklyn railway officials explained the practical difficulties of carrying out a regulation of this kind. In consequence of this testimony the commission modified the order by fixing the minimum temperature at 40 deg. and omitting the provision in regard to the thermometer.

The testimony as published in the pamphlet is taken from the reports of the hearings as printed in the ELECTRIC RAILWAY JOURNAL at the time. The pamphlet also contains a copy of a letter written by Mayor Gaynor of New York to a resident of Brooklyn who had complained to him that the cars in that city were not sufficiently heated. Mayor Gaynor replied that he wished that the companies did not heat their cars at all and recommended to the complainant that he walk back and forth from his office for a month and expressed a belief that at the end of that time he would not care so much about heat in the cars or finding fault with everybody and everything. The Southwest Missouri Railroad has a few extra copies of this pamphlet and so long as they last will send one to any manager who is having a cold car controversy.

In a recent letter, A. H. Rogers, president of the Southwest Missouri Railroad, says: "As a matter of fact we receive more complaints of the cars being too hot than of not being hot enough. From my observations, however, the chilly people are the ones who write letters to newspapers and make complaints to city officials."

Uniform Eight-Cent Fare Asked.—The United Railways & Electric Company, Baltimore, Md., has applied to the Public Service Commission of Maryland for permission to charge a regular fare of 8 cents to Curtis Bay all the time, instead of 5 cents in some instances and 8 cents in others, as at present.

Increase in Wages Demanded at Hamilton, Ohio.—Conductors and motormen on the local lines of the Ohio Electric Railway at Hamilton, Ohio, have asked for an increase of wages, which would give first-year men 25 cents an hour, with an increase of 1 cent for each year of service up to 30 cents an hour.

Petition to Require Sale of Tickets in Books.—The Mayor of Newburyport has petitioned for legislation to provide that every street railway in Massachusetts shall sell tickets or books of tickets for not more than 100 rides within limits of any city or town at a cost not to exceed 5 cents per ride within that city or town.

Non-Parking Ordinance Recommended.—The local transportation committee has recommended to the Chicago City Council the passing of an ordinance prohibiting the parking of automobiles in the loop district during rush hours. It is expected that this ordinance will be passed by the Council and become effective on March 1.

No-Smoking Movement at Toledo.—A letter, signed by 500 employees of the Toledo Shipbuilding Company, was received by E. R. Kelsey, of the Toledo Railways & Light Company, on Jan. 16, asking that smoking on the cars be prohibited. Mr. Kelsey has requested a member of the Council to introduce legislation to that effect.

Safety Campaign Aided by Movies at Toledo.—E. R. Kelsey, manager of the publicity department of the Toledo Railways & Light Company, recently made an address before the Scoutmasters' Association on "What the Boy Scouts Can Do for Safety in Toledo." This was accompanied by pictorial lessons in safety first on a moving picture machine.

Massachusetts Road Asks for 7-Cent Fare Unit.—The Worcester & Warren Street Railway has petitioned the Public Service Commission of Massachusetts for authority to increase its passenger fare unit from 6 to 7 cents, effective on Feb. 19. The road extends from West Warren to Spencer, where it connects with the Worcester Consolidated Street Railway. A 6-cent fare unit has been in force on the road for about ten years. The commission will hold a hearing on the application at Boston on Feb. 1.

Jitneys May Be Summarily Removed.—Chief of Police W. J. Petersen of Oakland, Cal., has announced that he will recommend to the City Council that jitneys be summarily removed from the city streets for violation of the traffic ordinance, if the San Francisco-Oakland Terminal Railways will agree to provide better service during the rush hours and an owl service. Mr. Petersen said that the jitney operators have not been obeying the ordinances and in order to remain on the streets they will have to show that their services are needed.

Near-Side Stop Opposed Because of Unpaved Streets.—New traffic ordinance that has been drawn at Galveston, Tex., for adoption by the City Commission contains several features to which objection is made by the Galveston Electric Company and the Galveston-Houston Electric Railway. One of these is the "near-side" stops. Alba H. Warren, general manager of the Galveston Electric Company, says that lack of paved streets in the residential section of Galveston will make this practically impossible. A public hearing on the proposition will be held by the commission, and consideration will be given to the reasons for the opposition.

Fort Worth Jitney Zone Ordinance Upheld.—Jitneys in Fort Worth, Tex., have lost their fight for an injunction to restrain the city authorities from enforcing the city ordinance prohibiting their operation on Main and Houston Streets, which in effect bars them from the business district of the city. The jitney drivers had appealed to Judge R. E. L. Roy of the Seventeenth District Court, alleging that the city ordinance was illegal in that the city had no authority for issuance of such a regulation as a police regulation. Judge Roy held that the city has authority from the Legislature to deny to public carriers for hire, including jitneys, the use of some of its public streets, and that the ordinance is not invalid because it forbids the use of a portion of Main and Houston Streets to jitneys.

Interstate Fare Increase.—The fare from Portland, Ore., to Vancouver, Wash., is to be increased by the Portland Railway, Light & Power Company from 25 cents to 30 cents for the round trip, when the Interstate Bridge across the Columbia River between the two cities is opened for traffic. The one-way fare of 15 cents will remain as at present. The fact that the tolls on the bridge will be 3½ cents for each street car passenger that crosses the bridge is responsible for the increase. The new tariffs will become effective on Feb. 15, the date it is expected cars will begin to use the bridge. Until the jitneys began to cut into the travel on the Vancouver run, the fare charged by the railway was 30 cents for the round trip. Later, the company cut the fare to 25 cents to those who bought round trip tickets, and the reduced rate was continued after the jitneys quit the run.

Inquiry Asked Into Binghamton Service.—The Council of Binghamton, N. Y., has requested the Public Service Commission of the Second District of New York to conduct an inquiry into the service furnished by the Binghamton Railway. Among other things the Council requests an improvement in the transfer system, cleaner and warmer cars, a half-fare rate for school children and hourly service on all lines from midnight until 6 a. m. The company has issued a statement in rebuttal in which it declares it has spent $500,000 for improvements since September, 1914. It has also recited these improvements in detail and has answered each charge made against it. Among other things, it says that whereas in 1913 the daily number of pull-ins was between thirty-five and forty the rolling stock has been brought to that point of fitness for service where there are only three or four pull-ins a week now.

Sedalia's Advertising Campaign Told in Booklet.—In an endeavor to acquaint its patrons with its operations, expenditures and aims, the City Light & Traction Company, Sedalia, Mo., operated by Henry L. Doherty & Company, ran a series of bi-weekly advertisements, and at the termination of the campaign compiled the advertisements in a booklet and distributed it among its patrons. The company states in its advertisements that its policy can be expressed in one word, "Friendship," for if the citizens have a feeling of real friendship for the company they will extend their patronage, and the company on its part will respond with "Improved Track Conditions," "More Continuous Service," and "Brand New Equipment." In its publicity campaign the company related that it has expended more than $60,000 in the last four years in an endeavor to prove its desire for the friendship of the public.

Efforts to Relieve Congestion at Columbus, Ohio.—The Council has instructed Director of Public Safety Barry to co-operate with the Columbus Railway, Power & Light Company, Columbus, Ohio, in working out a general rerouting plan for the purpose of relieving congestion and overcrowding of cars. Former efforts to re-route cars have met with opposition, but it now seems necessary to take some of them off High Street. Railway officials say that much of the overcrowding is due to congestion on the streets during the rush hours. H. W. Clapp, general superintendent of the company, said that during the past year eleven new cars have been purchased and eighteen rebuilt, modernized cars have been added. Besides, 136 of the large cars have been rebuilt and standardized. For the present year the company will purchase ten new cars and rebuild and modernize eight cars of the summer type.

C. E. R. A. Distributes Joint Time-Table Folder.—The first issue of the new joint interline folder published under the authorization of the Central Electric Railway Association, covering electric railroads in the association territory in Indiana, Ohio, Michigan and Kentucky, has been distributed for general circulation during the past week. This folder is the result of action taken by the C. E. R. A. as an association, for the promotion of increased passenger travel on the lines of the member companies, and the dissemination of information regarding schedules and the possibilities of interline travel to the patrons of these lines. Only those companies having membership in the C. E. R. A. are allowed to subscribe to the publication of this folder. The first issue of the folder is 50,000 copies, which will be increased in future issues in accordance with the demand. More than 80 per cent of the entire mileage of interurban roads in the C. E. R. A. territory is included in this joint folder. The distribution of the folder through approximately 700 time-table racks in ticket offices, hotels, etc., covers seven states, including ninety-five different cities.

Personal Mention

J. O. Shinn has been elected treasurer of the Water, Light & Transit Company, Carrollton, Mo.

H. E. Weyman has been appointed master mechanic of the Levis County Railway, Levis, Quebec.

John Cotter has been appointed roadmaster of the Joplin & Pittsburg Railway, Pittsburg, Kan.

A. F. Lane has been elected president of the Ephrata & Lebanon Street Railway, Ephrata, Pa.

C. A. Trimble has been elected treasurer of the Chicago, Aurora & De Kalb Railroad, Aurora, Ill.

J. C. Phillips has been appointed secretary and treasurer of the Missoula (Mont.) Street Railway.

F. W. Cherry has been appointed receiver of the Chicago, Aurora & De Kalb Railroad, Aurora, Ill.

G. E. Troll has been appointed auditor of the Chicago, Aurora & De Kalb Railroad, Aurora, Ill.

S. A. Moss has been appointed claim agent of the Wichita Railroad & Light Company, Wichita, Kan.

A. H. Dennis has been appointed chairman in charge of the Fort William (Ont.) Electric Railway.

Homer G. Brown has been elected president of the Sacramento Valley Electric Railroad, Dixon, Cal.

J. H. Berry has been appointed electrical engineer of the Maryland Electrical Railways, Annapolis, Ind.

H. O. Evans has been elected vice-president of the Ephrata & Lebanon Street Railway, Ephrata, Pa.

Phifer Smith has been appointed electrical engineer of the Bangor Railway & Electric Company, Bangor, Me.

F. M. Turnbull has been appointed auditor of the Trans-St. Mary's Traction Company, Sault Ste. Marie, Ont.

Penrose Spencer has been elected president of the Cripple Creek & Colorado Springs Railroad, Colorado Springs, Col.

H. L. Hansen has been appointed assistant treasurer of the Rutland Railway, Light & Power Company, Rutland, Vt.

W. J. Devine has been appointed assistant secretary of the Kentucky Traction & Terminal Company, Lexington, Ky.

H. F. Kirk has been appointed purchasing agent of the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind.

J. J. Smith has been elected second vice-president of the Sacramento Valley Electric Railroad with office at Brooks, Cal.

W. J. Bohon has been appointed secretary and general manager of the Glendale & Montrose Railway, Glendale, Cal.

Philip J. Kealy, president of the Kansas City (Mo.) Railways, was married on Jan. 23 to Miss Josephine H. Crowley of Washington.

Frank O'Brien has resigned as master mechanic of the Wheeling (W. Va.) Traction Company to accept the position of master mechanic of the Lansing shops of the Michigan Railway.

Edward A. Maher, Sr., vice-president and general manager of the Third Avenue Railway, New York, N. Y., on Jan. 26 was elected president of the company to succeed the late Frederick W. Whitridge.

Col. Bruce Cameron, superintendent of the United Railways, St. Louis, Mo., acted as chief of staff to Governor Frederick D. Gardner of Missouri, at the latter's inauguration on Jan. 8 in Jefferson City.

P. C. Paddock has been appointed purchasing agent of the United Railroads of San Francisco, San Francisco, Cal. Mr. Paddock before his recent appointment had been assistant purchasing agent snce last June.

Travis H. Whitney, member of the Public Service Commission of New York, First District, contributed a communication to the New York *Evening Sun* of Jan. 23, outlining the problems attending the construction of New York's new rapid transit facilities.

H. G. Louser, superintendent of the Reading Transit & Light Company, at Lebanon, Pa., has resigned this position in order to take an active interest in the Lebanon Electric Company.

Oliver H. Hughes has been appointed by Governor James M. Cox as a member of the Ohio State Public Utilities Commission, to succeed Louis M. Day. Mr. Hughes had been a member of the commission eleven years, previous to the administration of Governor Frank Willis.

S. J. Witt has been made master mechanic of the West Penn Railways, with office at Connellsville, Pa. Mr. Witt has been in the employ of the company for eleven years and has been night foreman, day foreman and general foreman. He takes the position formerly held by Daniel Durie, who for some time has been superintendent of railway operation of Division A of the West Penn system.

E. J. Mehren has been elected first vice-president of the McGraw Publishing Company, Inc., New York, N. Y., publisher of the ELECTRIC RAILWAY JOURNAL to succeed Hugh M. Wilson, whose resignation took effect on Jan. 1. Mr. Mehren has been editor of the *Engineering Record* for a number of years and will still continue as editor of that paper, devoting to that duty about half of his time.

Eliot Wadsworth of the firm of Stone & Webster, Boston, Mass., has retired from this organization in order to assume the direction of the American Red Cross as acting chairman of the Central Committee in Washington. Mr. Wadsworth graduated from Harvard in 1898, and in the same year entered the employ of Stone & Webster. First at Tampa, and later at El Paso and Dallas, he represented the firm in various capacities. In 1901 he organized the corporation department, and in 1902 the securities department. In 1909 he was admitted to partnership.

George H. Pegram, chief engineer of the Manhattan Elevated Railroad, the Interborough Rapid Transit Company, the Rapid Transit Subway Construction Company and the New York Railways Company, was elected president of the American Society of Civil Engineers at the annual meeting in New York this week. Mr. Pegram's experience in the civil engineering field covers a period of forty years, most of it in railroad work. In 1898, when the construction of a subway in New York City first was being urged strongly and seemed likely to be undertaken, the Manhattan Railway decided to build a number of extensions. It was then that Mr. Pegram was offered the position of chief engineer. The extensions were developed, but the introduction of electricity as a motive power added to the engineering department's responsibility. His appointment as chief engineer of the Interborough Rapid Transit Company and of the Rapid Transit Subway Construction Company came in 1905. Seven years later he was made chief engineer of the New York Railways Company. Among important works to be credited to him are the invention of the Pegram truss, the design of the Kansas City Elevated Railroad and that of the trainshed of the Union Terminal Station at St. Louis.

GEORGE H. PEGRAM

Obituary

James A. MacElhinny, counsel and secretary of the New York & North Shore Traction Company, Roslyn, N. Y., since its organization, died on Jan. 18 at his home in Port Washington, L. I., from pneumonia. Mr. MacElhinny was a graduate of Georgtown and Columbia Universities and was admitted to the bar in 1879.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Springfield-Carbondale Railway, Springfield, Ill.**—Incorporated to construct an electric railway from Springfield to Carbondale, via Hillsboro, Greenville, Carlyle, Nashville and Pinckneyville. Capital stock, $100,000.

***Transcona Electric Railway, Winnipeg, Man.**—Application for incorporation has been made to the Legislative Assembly by the Transcona Electric Railway, with power to construct, operate and equip electric railways, and also to carry on an electric light, power and gas business. Moran, Anderson & Guy, 402 Electric Railway Chambers, Winnipeg, are solicitors.

Coatesville (Pa.) Trolley Company.—Incorporated to construct a 5-mile trolley line. Capital stock, $30,000. H. I. Schotter, Coatesville, president. [Dec. 23, '16.]

FRANCHISES

San Diego, Cal.—The Los Angeles & San Diego Beach Railway has received a franchise from the Council to construct a line in San Diego.

San Diego, Cal.—The San Diego & South Eastern Railway has received a franchise from the City Council of San Diego to construct tracks on several blocks of N. Street, National Avenue and other streets.

East St. Louis, Ill.—The East St. Louis & Suburban Railway has received a franchise from the City Council of East St. Louis granting the company the exclusive right to operate cars over Piggott Avenue. The ordinance gives the company authority to sublease any portion of the Piggott Avenue line to any company desiring to enter the city.

Quincy, Ill.—The Quincy Railway has asked permission from the City Council for the construction of two loops, one at the northeast corner of Tenth and Sycamore Streets and the other at the southwest corner of Ninth and Locust Streets.

Waukegan, Ill.—The Chicago, North Shore & Milwaukee Electric Railroad has submitted a new franchise to the Council of Waukegan. Among the features of the proposed new ordinance are the possibilities of the extension of the Washington Street line and the construction of a powerhouse and carhouse in Waukegan. While the company is not willing to pave Glen Flora Avenue, it is considered likely that it will pay the $60,000 lump concession which has been tentatively agreed upon. The company is replacing all wooden poles with steel or iron, and will relay all tracks with 90-lb. rails, the tracks on North Avenue and Glen Flora Avenue to the tannery to be laid within eighteen months after the franchise is passed.

Canton, Ohio.—The Northern Ohio Traction & Light Company has received a franchise from the Council to construct extensions of its lines in Belden Avenue N.E. and Eighth Street N.E. and in Belden Avenue S.E., both lines to connect with the Tuscarawas Street E. line.

Vancouver, Wash.—With only one or two minor changes, the City Council of Vancouver passed the franchise ordinance granting the Portland Railway, Light & Power Company the right to lay tracks on three streets adjacent to the Interstate Bridge approach across the Columbia River between Portland, Ore., and Vancouver, Wash. The franchise extends for five years, and the company is to maintain the paving between the rails, and for 1 ft. each way. It is optional with the Council to renew the grant after Dec. 31, 1921.

Neenah, Wis.—A new franchise will be granted by the City Council of Neenah to the Wisconsin Traction, Light, Heat & Power Company for extending its lines in Neenah.

TRACK AND ROADWAY

Arkansas Northwestern Railroad, Bentonville, Ark.—Plans are being made to resume operation of this company's line between Bentonville and Rogers. Service was discontinued several months ago, when the St. Louis & San Francisco Railway Company increased the rental on a portion of its track which was used by the company.

The Pine Bluff (Ark.) Company.—This company reports that during 1917 it will construct 1¼ miles of new track.

Northern Electric Railway, Chico, Cal.—The Railroad Commission of California has issued a supplemental opinion in the application of the Vallejo & Northern Railway for permission to build its tracks at grade across the tracks of the Southern Pacific Company in Suisun, extending the time in which the Vallejo Railway & Northern must complete a subway ordered to be constructed by the Commission. A temporary grade crossing was installed to enable the company to secure an entrance to Suisun, and business in Suisun has been adjusted to fit this new line.

Grass Valley, Cal.—The Empire Mines Company has received a permit from the Board of Supervisors to construct an electric railway to connect the Empire and Pennsylvania mines. [Sept. 30, '16.]

Municipal Railways of San Francisco, San Francisco, Cal.—Construction of the line through the Twin Peaks Tunnel will be begun by the Municipal Railways of San Francisco on July 1, and it is expected that the line will be in operation by Sept. 1.

Lordship Company, Bridgeport, Conn.—This company plans to construct a line from Lordship Manor to Hard's Corner, Stratford, this summer. When complete, the Lordship Company will connect with the Connecticut Company's lines at Hard's Corner, extending southerly in Main Street, Stratford, to Lordship, and through Lordship Manor to Hollister and Stratford Avenues, again connecting with the lines of the Connecticut Company. The company recently decided to construct a boardwalk at Lordship, along the shore for about a third of a mile, a building to be used as a restaurant, a large pavilion on the beach for public use, and other features.

Bristol & Plainville Tramway, Bristol, Cnn.—This company has filed a petition to the General Assembly for an amendment to its charter to extent the time to construct and operate a line of not more than two tracks on Main Street, South Street, Wolcott Street, Hill Street, and West Street, Bristol.

***Washington, D. C.**—It is reported that a contract has been closed with the Southern Finance & Construction Company, Nashville, of which John K. Parsons, Wilmington, Del., is president and R. B. Herzer, Nashville, is secretary, to construct a line from Washington, D. C., to Gettysburg, Pa., 75 miles.

Urbana & Champaign Railway, Gas & Electric Company, Champaign, Ill.—The Urbana & Champaign Railway, Gas & Electric Company will soon place in service two new turnouts in the eastern part of Urbana to facilitate meeting the city cars of this company with the interurban cars of the Illinois Traction System. The company will also construct some special work in Urbana in order to give the Kankakee & Urbana Traction Company, operating over its lines through trackage agreements, physical connection with the tracks of the Wabash Railway.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—The rehabilitation of this company's property in Waukegan this year includes expenditures to the amount of $250,000, the plans including new lines to be laid on North Avenue and Glen Flora Avenue and improvements along the right-of-way of the West line.

Southern Illinois & St. Louis Railway, Harrisburg, Ill.—This company reports that construction will be begun this spring on its proposed line to connect Harrisburg, Pittsburgh, Marion, Johnston City, West Frankfort, Benton and Herrin, 60 miles. Contracts have been awarded to the American Car Company, St. Louis, Mo., for eighteen motor cars; to the General Electric Company, Schenectady, N. Y., for the electrical equipment; to the Illinois Steel Company, Chicago, Ill., for 70-lb. rails; to the Rail Joint Company, Chicago, for rail joints and to the Indiana Tie Company, Evansville, Ind., for ties. Frank Payne, Marion, general superintendent. [Dec. 2, '16.]

Lincoln Railway & Heating Company, Lincoln, Ill.—A company of local citizens is being organized to take over the railway business of the Lincoln Railway & Heating Company. Operation was suspended about two months ago.

St. Joseph Valley Railway, Elkhart, Ind.—It is reported that this company's proposed extension to Pioneer will be completed this summer. It is expected that the line will connect with the Toledo & Western Railroad at Pioneer.

Interstate Public Service Company, Indianapolis, Ind.—This company will construct 2900 ft. of second main track near Indianapolis.

Louisville & Southern Indiana Traction Company, New Albany, Ind.—This company proposes to construct an extension from Jeffersonville to the Howard Shipyards for passenger and freight traffic.

Fort Dodge, Des Moines & Southern Railway, Boone, Iowa.—A report from the Fort Dodge, Des Moines & Southern Railway states that during this year the company will construct 10 miles of line connecting Fort Dodge and Brushy to permit operation to Webster City and Lehigh on the old Crooked Creek Railway, now a part of the Fort Dodge, Des Moines & Southern Railway.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—The new bridge over the Kaw River has been completed and is now being used by the Kansas City, Kaw Valley & Western Railway. The temporary bridge is now being torn down.

***Wichita, Kan.**—William R. Burr, Washington, D. C., is interested in the construction of an electric railway to connect Wichita with the oil fields of Augusta and El Dorado.

Kentucky Traction & Terminal Company, Lexington, Ky.—This company plans the expenditure of $200,000 during 1917 for improvements and extensions to its system.

***Boothbay Harbor, Me.**—Luther Mattocks, Boothbay Harbor, is interested in the proposed construction of an electric railway to connect with the Lincoln and Knox County division of the Maine Central Railroad. It is estimated that the cost would be about $150,000, and it is stated that financiers have agreed to furnish half of this amount.

Kansas City (Mo.) Railways.—The following extensions have been ordered by the Kansas City Railways for this year: Indiana Avenue from Thirty-sixth to Forty-third Streets; Twenty-fifth Street from Grand to Troost Avenues; Broadway from Southwest Boulevard to Twenty-fifth Street; Twenty-fifth Street from Broadway to Summit Street; Troost Avenue from Forty-eighth to Fifty-fifth Street; St. John Avenue from Belmont to Bennington Avenue; Cambridge and Winchester Avenues, Kansas City and Independence electric line to Fifteenth Street; Woodland Avenue from Forty-third Street to Swope Parkway; Hardesty Avenue from St. John Avenue to Saida Avenue; Twenty-seventh Street from Chelsea to Denver Avenue; Thirty-ninth Street from Summit to Main Street.

United Railways of St. Louis, St. Louis, Mo.—A report from the United Railways of St. Louis states that it will construct 1 mile of new track in the city of Maplewood during 1917.

Brooklyn, N. Y.—Plans have been approved for the construction of a new bridge across Sheepshead Bay at the foot of Ocean Avenue. The proposed structure will be 700 ft. long and 80 ft. wide, of concrete and steel, with room for a double trolley track. The structure will cost about $200,000.

Brooklyn (N. Y.) Rapid Transit Company.—Bids are now being invited by the Public Service Commission for the First District of New York, to be opened on Feb. 7, for the relocation of the tracks in New Utrecht Avenue, Brooklyn, between Thirty-ninth and Eighty-first Streets, about 2½ miles. Half the cost of the work is to be borne by the Nassau Electric Railroad, a subsidiary of the Brooklyn Rapid Transit Company, and half by the city. There are two surface tracks at the present time on New Utrecht Avenue, located near the easterly curb. They were formerly used for the operation of West End trains, but upon the construction of the New Utrecht elevated line the tracks were given over to trolley operation. The new tracks will be located approximately in the center of the street.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—This company expects to construct 2 miles of new track in Erie, Pa., during 1917.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has awarded two contracts covering the construction of the Livonia Avenue extension of the Eastern Parkway in Brooklyn. The contract for supplying the necessary steel was awarded to the American Bridge Company, New York, the lowest bidder, at $1,431,755. The contract for the erection of the steel, and other construction work, was awarded to W. G. Cooper, New York, the lowest bidder, at $257,164. The Livonia Avenue extension is a two-track elevated line to be operated by the Interborough Rapid Transit Company when completed. All work under these contracts is to be done within fifteen months of the delivery of the contracts.

New York, Westchester & Boston Railway, New York, N. Y.—It is reported that this company will construct an extension from White Plains to Danbury.

Empire United Railways, Syracuse, N. Y.—Plans are being made by the Empire United Railways to double-track its line on West First Street, Oswego, from Bridge to Utica Streets, at a cost of about $30,000.

Goldsboro (N. C.) Electric Railway.—This company expects to construct an extension from Belleme to Greenleaf, ½ mile.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.—The Cleveland, Southwestern & Columbus Railway has asked the Public Utilities Commission of Ohio for permission to issue $213,278 in bonds to finance improvements and extensions.

Hillsboro, Cynthiana, Bainbridge & Chillicothe Traction Company, Hillsboro, Ohio.—At a recent meeting of the Hillsboro, Cynthiana, Bainbridge & Chillicothe Traction Company, which proposes to construct a line from Hillsboro to Chillicothe, the following officers were elected: J. W. Watts, Hillsboro, president; N. J. McGuire, Indianapolis, Ind., first vice-president; Berry W. Spargur Marshall, Ohio, second vice-president; J. C. Anderson, Chillicothe, Ohio, secretary-treasurer; and R. R. Faulkner, Indianapolis, general manager. [Dec. 30, '16.]

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—This company plans to construct a temporary track across the South Avenue viaduct which will connect with the Cedar Street and Poland Avenue lines until the new bridge is built.

Port Credit, Ont. — The hydro-radial by-law has been passed by all the municipalities interested from Port Credit to St. Catharines and from Welland to Bridgeburg, with the exception of Hamilton.

Toronto (Ont.) Civic Railway.—The construction of a civic car line on Dufferin Street from the city limits to the Exhibition Grounds is under consideration.

Toronto (Ont.) Railway.—An order has been issued by the Ontario Railway Board to the Toronto Railway to begin the construction of the Pape Avenue extension not later than April 1. The order states that a double track shall be laid on Gerrard Street northerly along Carlaw to Guelph Avenue, then east to Pape Avenue and north to near Danforth.

Southern Pacific Company, Portland, Ore.—It is reported that the Southern Pacific Company plans to construct a line between Portland and Salem.

Jackson Railway & Light Company, Jackson, Tenn.—Work has been begun by the Jackson Railway & Light Company reconstructing its track on Market Street and Highland Avenue.

***Martinsburg, W. Va.**—Surveys are being made for a proposed electric railway from Martinsburg through Jefferson County and into Loudoun County, Va., to connect with the Washington & Old Dominion Railway, which operates a line from Washington, D. C., to Bluemont, Va. The Martinsburg Power Company, Martinsburg, is reported interested.

Milwaukee Western Electric Railway, Milwaukee, Wis.—At the annual meeting of the stockholders of the Milwaukee Western Electric Railway, a plan was adopted, by which a holding company will be formed under the laws of Delaware, to supervise and control the railway. This corporation will be known as the Milwaukee Western Railway Company, with a capital of $2,750,000, of which $2,000,000 will be common stock and $750,000 will be 6 per cent cumulative preferred stock. The property will be owned and operated by the Milwaukee Western Electric Railway Company. Eighty per cent of the stock of the company has been transferred to the holding company, and a committee of Milwaukee business men will shortly start a campaign to complete the right-of-way from Milwaukee through New Butler to Alderly. Committees of business men from towns along the line have been organized to connect the links from Alderly to Fox Lake. With franchises secured for hauling freight, milk, express and mail through Milwaukee, and over the entire route of 74 miles, and with most of the right-of-way held by deeds, ownership of depot sites, and land for park purposes established and gravel purchased, actual construction work will soon be under way. In Milwaukee, the electric railway will pass over the tracks of the Milwaukee Electric Railway & Light Company on Lisbon Avenue, Walnut and Third Streets to the Public Service Building. Fox Lake will be the terminal for the first division of the road to be built now. Eighteen lakes and resorts will be served by the Milwaukee Western Electric Railway, J. W. Barber, Milwaukee, secretary. [Mar. 4, '16.]

SHOPS AND BUILDINGS

Illinois Traction System, Peoria, Ill.—It is reported that this company plans to erect a new modern passenger and freight station in Danville. The new building will have a frontage of 125 ft. on Vermilion Street and will extend west 200 ft. to Walnut Street. The train shed will extend west from the Vermilion Street side and the freight house will be on the Walnut Street side. New tracks will be laid and the cars will avoid passing through the congested public square.

POWER HOUSES AND SUBSTATIONS

Arkansas Valley Railway, Light & Power Company, Pueblo, Col.—During 1916 the Arkansas Valley Railway, Light & Power Company constructed 37½ miles of 13,000-volt transmission line and 32 miles of 22,000-volt transmission line, serving the mining and agricultural districts. The 1917 program of the company includes the construction of 10 miles of 13,000-volt transmission line to serve several large irrigation projects. Transformers are being installed in the Cripple Creek district by the company for the 200-hp. slime pumps at the Portland mill. Wires and circuits in the Canon City district are being rearranged.

Morris County Traction Company, Morristown, N. J.—The Morris County Traction Company has closed down its plants at East Dover and Chatham and now secures energy from a substation erected at the foot of Mine Hill, which is operated by the New Jersey Power & Light Company, Dover, N. J.

Lehigh Valley Transit Company, Allentown, Pa.—This company is installing a new 10,000-hp. steam turbine at its power plant in Allentown.

Reading Transit & Light Company, Reading, Pa.—The Metropolitan Electric Company, operating in Reading and vicinity, has constructed nearly 100 miles of transmission lines during the past year in the territory served by that company and the Reading Transit & Light Company. Connections have been made with the properties of the American Gas Company at Pottstown and the United Gas Improvement Company at Norristown. Construction is well along on the transmission line of the Reading Transit & Light Company at Lebanon, which, it is expected, will be finished early in the spring.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—Plans are being prepared for the erection of an addition to the power plant of the Milwaukee Electric Railway & Light Company in Racine, to cost about $18,000, it is estimated.

Manufactures and Markets

Discussions of Industrial Conditions
A Department for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Business Announcements Trade Literature

Checking Up the Cost of Last Year's Maintenance Material

A Review of Purchases, Amounting to More Than $1,000,000 for the Last Twelve Months, Shows Large Increases

BY H. J. VANCE
Purchasing Agent Illinois Traction System

At the end of one busy year and at the beginning of another that apparently will excel in complexities, a thorough review of just how prices have been averaging is being made by the purchasing department of the Illinois Traction System and other McKinley System public utilities. This review takes into account the total purchases for maintenance purposes covering a period of twelve months. These purchases will amount to more than $1,000,000. The accompanying list covers a little less than one-fourth of the total.

Each article or class of material bought for maintenance use is considered separately, and the percentage of increase in price is shown. It should be noted that the percentages do not mean the actual percentage of increase in the present market over that of normal times but represent the actual percentage so far as the individual purchase of the McKinley properties are concerned.

The list here shown covers $274,125 worth of purchases for maintenance purposes, of which amount $49,133 is for material which through contract or forced buying does not show any increase over normal times, and, of course, this reduces the percentage as a whole. On the basis of the purchase of $274,125 worth of material, $49,133 of which bears no increase, the actual percentage of increase on the whole is 22½ per cent.

It will be noted, however, from the list, that it does not include copper wire nor steel products to any great extent. When these are included in the other three-quarters of the completed list, it is estimated that the general increase will be between 35 per cent and 40 per cent.

French Industrial Conditions

Report of Commission Discloses Large Field in France for American Manufacturers After the War

The American Industrial Commission to France has made public parts of its report to the American Manufacturers' Export Association on the probable conditions which will confront the industries of France at the close of the war. Interest in the report to electrical manufacturers is heightened by the character of the commission. At its head was W. W. Nichols, assistant chairman Allis-Chalmers Manufacturing Company, Inc., and among the other twelve American engineers or business men who were members of the commission were Dr. C. O. Mailloux, consulting engineer, New York, and J. E. Sagüe, former New York Public Service Commissioner. The president of the American Manufacturers' Export Association is E. M. Herr, president Westinghouse Electric & Manufacturing Company. The commission sailed from New York on Aug. 26, 1916, and after landing at Bordeaux, made a comprehensive tour of the industrial regions of France.

The portions of the report made public say, in part:

"Even at this time, with the war raging, it was found that there is much reconstruction and new building ready to be undertaken. When peace comes, the amount of construction of industrial plants generally will be large. This applies both to France and Belgium. Since the war a number of companies in the north, unable to operate their mills, have started new plants in other sections of France. We often heard the hope expressed that—after the war—American manufacturers and American capital would co-operate with French interests and erect new plants in France.

"France and America are not likely to be serious competitors in the world market because their strength lies in different directions. Our manufacturing practice is the result of a great uniform steady home demand from one end of the country to the other. Our manufacturers export

INCREASE IN MAINTENANCE MATERIALS FROM RECORDS OF ILLINOIS TRACTION SYSTEM

	Per Cent		Per Cent		Per Cent		Per Cent
Acids	67	Brushes, carbon	6	Connectors, miscellaneous	30	Files, office	8
Alcohol	43½	Brushes, copper	22	Compensators	6	Fillings, spark cap arrester	66
Aluminum sulphate	140	Brushes, paint	11	Compounds, various kinds	4	Films, duplicator	4
Ammonia	11	Brooms, mops, etc.	16⅔	Cones, lightning arrester	2½	Fire extinguishers, etc.	1
Armature coils, etc.	14	Busbar copper	200	Contact fingers	5	Fire clay	7
Armored conductor	25	Burners	9⅓	Contactor repairs	7	Fittings, miscellaneous	16
Asbestos cement	25⅔	Bushings	8	Controllers and repairs	15	Flags and staffs	24
Asbestos mill board	120	Buttons	5	Copper cable	141	Forms	24
Ash, soda	7	Cabinets, cut out	4	Cord, sash	14	Fuses	16⅔
Attachments	25	Cams	6½	Crucibles	190	Fuse cutouts	29
Axes	11	Candles	20	Couplers, miscellaneous	12	Gas bags	15
Axles	19	Canopies	10	Covering, pipe	25	Gas and hose cocks	33½
Awnings	72	Cans, waste	31	Cups, grease	6	Headlight repairs	4
Badges, property	2½	Canvas	25	Cuspidors	25	Heater repairs	1⅓
Bars, angle	221	Caps	7	Cutters, miscellaneous	3	Hinges, butts, etc.	9
Bars, claw	32	Cases, bond	10	Covers, miscellaneous	1	Lamp cord	41
Bars, digging	31	Cases, pillow	22	Dampers	8	Lanterns, switch lamps, etc.	8⅓
Bars, lining	10	Cases, transfer	9	Detector, voltage	10	Lightning arresters	14
Bars, oval	27	Casings, tire	4	Dextrine, yellow	20	Long pull bar ends	6
Bars, trolley	40	Castings	14	Dimelites	15	Lock nuts, washers, etc.	36
Bearings	12	Castings, bronze	25	Discs, valve	21	Money drawer	17
Bellows	11	Catchers, trolley	11	Disinfectants	5	Motor cars and repairs	17
Belting	3⅔	Catches	20	Drills, carbon steel	20	Oil repairs	14
Bends	29	Carbons	20	Drills, twist	63	Pails, galvanized, etc.	56
Binders	5	Cards, index	35½	Drilling	19	Paper clips	6
Bits	88	Carpet	3	Duck, canvas	34	Paper, fish	19
Board, miscellaneous	17	Cells	57	Dynamite	30	Retriever parts	6⅓
Bodies, socket	11	Circuit breakers	9	Ells, miscellaneous	21	Sand paper and emery	26
Boiler cleaners	1	Claim backs	55	Ends, aisle	4	Smithing coal	8
Bolts	71½	Clamps, miscellaneous	7	Envelopes	25	Spring cotters	48
Bolts, track	53	Clevices	15	Eyes, suspension	9	Stove pipe, etc.	21⅔
Bonds, rail	31	Clips	12	Eyes, screw	31	Switch blocks	8
Books	11	Clock dials	3	Eyelets	25	Tool bags	28
Borax	20	Cloths, miscellaneous	15	Fans, exhaust	10	Torpedoes	13⅓
Boxes, miscellaneous	8	Chain, lamp	34	Fasteners, paper	45	Trolley cord	8
Blades, hacksaw	27	Chairs, office	4	Faucets, petroleum	7	Trolley crossings and crossovers	24
Blocks, tackle	31	Chamois	8	Fenders, car	33	Trolley harps, etc.	13⅓
Blotters	100	Chisels	8	Felt, tarred	31	Trolley poles, bases, etc.	18½
Braces, crossarm	42	Coil chain	17	Ferrules, condenser	30	Twine	48
Brackets	7⅔	Coin bags	6	Fiber, drags	3	Twine, Barbour's	86
Brake beams	2¾	Cogs, bevel	4	Fiber, sheet	67	Valve chambers	10
Brakes, hand wheel	10	Coke	100	Figures, steel	6	Water backs	2
Brass	48	Collars, miscellaneous	7	Files	24	Wheelbarrows	20
Brasses, journal	54½	Commutators	10	Files, machinists'	23		

only their surplus products, and they can only export them as they are, as they cannot profitably make a smaller amount of merchandise differing from their usual output. Wherever, therefore, the American manufacturers turn out a product which as it stands meets the requirements of foreign trade, they are strong. Certain typical American specialties, sewing machines, cash registers, typewriters, etc., fear no rivals.

"Broadly speaking, French industry has arisen to satisfy its own home wants, which are not large, but very diversified. France has adapted her industry to meet the varied wants of Europe and America, and this has qualified her in a peculiar degree to fill relatively small orders in special artistic goods with special imprints and in special styles with great profit to herself."

So far as railway supplies are concerned, the commission believes that after the war America may be called upon to supply a considerable number of the detailed parts of locomotives and cars, such as axles, journal boxes, wheels and tires. The commission said that it could see no good reason why chilled cast-iron car wheels should not be extensively used on the French railways in freight service. In track material, this country could probably furnish rails to good advantage until the French, Belgian and British mills are able to produce them in sufficient quantity.

Boston Elevated Purchases Thirty-five Large Cars

Permission has been granted by the Massachusetts Public Service Commission to the Boston Elevated Railway to purchase thirty-five steel cars for service in the Cambridge subway and Dorchester tunnel extension to Andrew Square. The contract for the cars has been awarded to the Pressed Steel Car Company, Pittsburgh, Pa., and the trucks to the J. G. Brill Company, Philadelphia. It is expected that the contract for motors will be awarded this week. In a recent letter to the commission, President Matthew C. Brush of the railway company stated that the cost of these cars complete will be about $18,500 each, compared with $11,415 each for similar cars in 1912. Mr. Brush expressed regret at being obliged to purchase cars at the above advance, but informed the board that such action is necessary in order to be prepared for the opening of the tunnel to Andrew Square. The new cars are similar to those already in service in the Cambridge subway and are 69 ft. 2½ in. long over all, seating seventy-two passengers each. The distance from center to center of trucks is 51 ft., and the total estimated weight loaded with 291 passengers at 140 lb. each is 127,147 lb. The total weight of the car light is 86,407 lb., various included weights being body, 41,393 lb.; trucks, 21,961 lb.; two motors without gears, 12,300 lb.; air-brake equipment and piping, 3518 lb.; controlling equipment and conduit, 5620 lb.; miscellaneous, 1615 lb.

National Foreign Trade Convention

The chief topic of discussion at the fourth National Foreign Trade Convention, held in Pittsburgh, Pa., on Jan. 25-27, was the future of the foreign trade of this country after the cessation of hostilities in Europe. In a special report the National Foreign Trade Council called for the immediate enactment of the Webb bill, establishing authorized co-operation among American exporters. Except for certain House amendments, the elimination of which was urged, the Council declared the bill necessary to avert a disastrous condition of "European co-operation versus American-compelled competition" after the war.

Willard Straight, vice-president American International Corporation, New York, N. Y., in speaking on "The Foreign Trade Aspect of the Tariff," stated that the tariff might be utilized for the encouragement of export trade in either or both of two ways—through reciprocal tariff concessions, or by the threatened application of retaliatory measures to prevent discriminations.

Lewis E. Pierson, chairman Irving National Bank, New York, N. Y., was of the opinion that foreign credit practices could be improved. In the course of his address on this subject he said:

"With a few notable exceptions the attitude of American banks toward the extending of credit to foreign customers is very much open to criticism. If we are to become the great creditor nation of the world we must assume the responsibility and develop the liberality which go with that exalted position.

"There is no legislative panacea for the ills of our banking situation in foreign trade. As a basis for constructive results I would suggest the appointment by the National Foreign Trade Council of a committee to co-operate with a committee of the American Bankers' Association to study the question of American banking in foreign trade and make recommendations."

CURRENT PRICES FOR MATERIALS

Quoted Thursday, Jan. 25.

Copper (electrolytic)	New York, 31 cents per pound
Rubber-covered wire (base)	New York, 38 cents per pound
Tin (straits)	New York, 45½ cents per pound
Lead	New York, 7¾ cents per pound
Spelter	New York, 10 cents per pound
Rails, A. S. C. E., O. H	Mill, $40 per gross ton
Rails, A. S. C. E., Bess	Mill, $38 per gross ton
Wire nails	Pittsburgh, $3 per 100 pounds
Steel (bars)	Pittsburgh, 3.25 cents per pound
Sheet iron (black, 28 gage)	Pittsburgh, 4.50 cents per pound
Sheet iron (galv., 28 gage)	Pittsburgh, 6.25 cents per pound
I-beams over 15 in.	Pittsburgh, 10 cents per pound
Galvanized wire	Pittsburgh, 3.65 cents per pound
Cement (carload lots) without rebate for sacks,	New York, $1.97 per barrel
Cement (carload lots)	Chicago, $1.96 per barrel
Cement (carload lots)	Seattle, $2.20 per barrel
Linseed oil (raw, 5-bbl. lots)	New York, 96 cents per gallon
Linseed oil (boiled, 5-bbl. lots)	New York, 97 cents per gallon
White lead (100-lb. keg)	New York, 9¾ cents per pound
Turpentine (bbl. lots)	New York, 55½ cents per gallon

OLD METAL PRICES

Copper (heavy)	New York, 28½ cents per pound
Copper (light)	New York, 24 cents per pound
Red brass	New York 18 cents per pound
Yellow brass	New York, 17½ cents per pound
Lead	New York, 6.85 cents per pound
Steel car axles	Chicago, $34 per net ton
Zinc	7½ cents per pound
Iron car wheels	Chicago, $19 per gross ton
Steel rail (scrap)	Chicago, $24.50 per gross ton
Steel rail (relaying)	Chicago, $30 per gross ton
Machine shop turnings	Chicago, $9.25 per net ton

Track Circuit Signaling Work Inactive

The manufacturers of track-circuit control automatic block signals report little activity in new work in the electric railway field. Probably the most important job recently completed was the installation of 11 miles of automatic blocking on the Brazil division of the Terre Haute, Indianapolis & Eastern Traction Company in Indiana. One or two prominent interurban systems have recently made inquiries regarding a considerable amount of blocking, but the activity is not sufficient to warrant the statement that these roads will shortly purchase signaling material in any considerable quantity.

Some interurban roads which installed automatic blocking within the last two or three years purchased, at the time of the first installation, certain equipment for future construction work. It is stated that these roads still have the material in their storehouses and that financial and operating conditions have not warranted the erection cost.

The managers of the electric railways, particularly in the interurban territory of the Central States fully recognize the value of signaling, and there is no doubt that when financial conditions are relieved and the high cost of manufactured products seeks its earlier level, there will be an active resumption of block signal work.

ROLLING STOCK

International Railway, Buffalo, N. Y., announces that it will purchase fifty new cars of the front and rear entrance and center-exit type to be used on the city lines.

Montreal & Southern Counties Railway, Montreal, Canada, has placed an order with the Ottawa Car Company for three motor and three trailer cars.

Public Service Railway, Newark, N. J., has ordered fifty open and 100 closed cars from the Cincinnati Car Company. The open cars will be similar to the large open-bench cars described in the ELECTRIC RAILWAY JOURNAL of June 19, 1915, and will be equipped with GE-200 motors with PC control.

The closed cars are similar to those built in the company's shop and described in the ELECTRIC RAILWAY JOURNAL of Jan. 15, 1916, with the exception that seventy-five of them will be equipped with four West. 514 motors. with HLD control, and the remaining twenty-five, intended for the Southern division, will each have two West. 307 CV motors with HL control.

Ft. Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., noted in the ELECTRIC RAILWAY JOURNAL of Dec. 22 as being in the market for three-passenger cars and one freight motor car, has placed the orders for these cars with the St. Louis Car Company and the Cincinnati Car Company respectively. The following details have been specified for this equipment:

	Motor Car	Freight Car
Type of Car	3-Compartment Interurban	Freight motor
Seating capacity	46	
Weight (car body only)	26,500 lb.	17,500 lb.
Bolster centers, length	28 ft.	22 ft.
Length of body	42 ft. 2 in.	38 ft.
Over vestibule	47 ft.	Over vestibule 40 ft.
Width over sills	8 ft. 9 in.	8 ft. 0 in.
Height, rail to sills	43 in.	39 in.
Sill to trolley base	8 ft. 8½ in.	8 ft. 10 in.
Body, wood or metal	Steel	Wood
Interior trim	Wood, cherry finish	
Headlining	Agasote	
Roof, type	Arched	Arched
Underframe, wood, metal or composite	Composite	Composite
Air brakes	Westinghouse Type D2 EG	Westinghouse Type D2 EG
Axles	Baldwin AERA Standard	Baldwin AERA Standard
Bumpers	Channel	Channel
Cables	Westinghouse	Westinghouse
Car trimming	Statuary, bronze finish	
Conduits and junction boxes	Crouse Hinds	Crouse Hinds
Control, type	Westinghouse HL	Westinghouse HL
Couplers	Tomlinson MCB radial	Tomlinson MCB radial
Curtain fixtures	Ring No. 88 Curtain Supply Co.	
Window fixtures	Forsyth Bros. brass sash	
Curtain material	Pantasote	
Fenders or wheelguards	Steel locomotive pilot.	Locomotive pilot
Gears and pinions	Nuttall	Nuttall
Gongs	Crewson pneumatic	Crewson pneumatic
Hand brakes	Peacock no staff	Peacock no staff
Heaters	Peter Smith hot water	
Headlights	Luminous arc and incandescent	Luminous arc and incandescent
Journal boxes	Symington	Symington
Motors, type and number	Four West. No. 306 CV6	Four West. No. 306 CV
Motors	Inside hung	Inside hung
Paint	P.R.R. Standard Flood & Conklin	Yellow car builders System Pan
Sanders	Knight pneumatic	Knight pneumatic
Sash fixtures	O. M. Edwards	
Seats, style	Stationary, cross, St. Louis Car Co.	
Seating material	Plush, leather in smoking room	
Springs	Standard Steel Company	Standard Steel Company
Step treads	Lead filled	
Trolley catchers or retrievers	No. 2 Knutson	No. 2 Knutson
Trolley base	U. S. No. 14	U. S. No. 14
Trucks, type	Baldwin No. 73-18-K	Baldwin No. 73-18-K
Varnish	Flood & Conklin	Flood & Conklin
Ventilators	Railway Utility	
Wheels	Rolled steel standard	Rolled steel

TRADE NOTES

Jarrett Chambers Company, Inc., New York, N. Y., engineers and contractors, announce that C. S. Rindsfoos, C. E., has become associated with the firm.

Railway Improvement Company, New York, N. Y., has received an order of 3800 Rico sanitary straps from the Detroit United Railway.

McGuire-Cummings Manufacturing Company, Paris, Ill., manufacturer of cars and trucks, will rebuild its machine shop during the coming year. The estimated cost of the building is $18,000.

Naugle Pole & Tie Company, Chicago, Ill., has opened an office at 305 Masonic Temple, Cedar Rapids, Iowa, with J. B. Wilmott in charge. This will better enable the company to serve its customers in this territory.

Gulick-Henderson Company, consulting and inspecting engineer, which has physical and chemical laboratories in Pittsburgh and other cities, announces the removal and consolidation of its general offices from 30 Church Street and 120 Broadway to 13-21 Park Row, Suite 1932-1939.

W. L. Batt has been made sales manager of the Hess-Bright Manufacturing Company, and will have entire charge of its sales after Feb. 1, 1917. Mr. Batt has been connected with this company since its early days, and has for many years engaged in doing much of the pioneer work that was necessary to develop the industry in this country.

E. G. Long Company, New York, N. Y., announces that Arthur A. Hebert has joined its staff and will have charge of railway materials and steel products. Mr. Hebert has been identified with the New York office of the Midvale Steel Company for the past fourteen years, being in charge of that office previous to the purchasing of the company by the Midvale Steel & Ordnance Company.

Haese Track Sander Company, Milwaukee, Wis., announces that it has opened new offices at 426 Merchants & Manufacturers Bank Building, Milwaukee, Wis. This company reports orders for sanders from the following street railways: Milwaukee Northern Railway, Chattanooga Traction Company, Eastern Wisconsin Railway & Light Company and the Joplin & Pittsburgh Railway.

Bates Expanded Steel Truss Company, Chicago, Ill., reports the following sales of its expanded steel poles for trolley and line construction work: Chicago, Ottawa & Peoria Railway, eighty-two poles; Chicago Surface Lines, fifty poles for a new extension on South State Street. The Milwaukee Coke & Gas Company has just placed its seventh order for Bates poles which are used for supporting heavy cables and distribution lines.

Johnson Fare Box Company, Chicago, Ill., through its St. Louis agents, the Grayson Railway Supply Company, has received an order for 345 fare boxes from the United Railways Company of St. Louis. With this order completed, the company will have more than 800 Johnson fare boxes in service on its lines. This company also has placed an order with the Johnson Fare Box Company for 200,000 metal tickets of 5-cent denomination, which will be sold to the public in place of paper tickets.

ADVERTISING LITERATURE

Searchlight Company, Chicago, Ill., is distributing a private mailing card on its Searchlight oxy-acetylene welding outfit.

Portland Cement Association, Chicago, Ill., has issued a twelve-page bulletin of suggested specifications for concrete floors, streets and structures.

Electric Storage Battery Company, Philadelphia, Pa., has issued bulletin No. 162 on the progress made in the construction of its new buildings since June, 1916.

Thompson Electric Company, Cleveland, Ohio, is distributing a bulletin on its automatic safety disconnecting hangers, cable clamps and pulleys. This bulletin also illustrates and describes a bracket attachment and spreader arm made by the company.

Western Electric Company, Chicago, Ill., has issued an attractive folder containing reproductions of eleven 4¾ in. x 6¾ in. photographs illustrating the use of its Davis flood lamps in lighting Niagara Falls, the Denver post office, typical railroad and factory yards, etc.

American Railways Equipment Company, Dayton, Ohio, is distributing a postcard folder entitled, "Takes All the Tricks," descriptive of the American fare box, which registers all fares on the fare box and the coins and paper tickets through the fare box.

Barber Asphalt Paving Company, Philadelphia, Pa., is distributing a well-illustrated 20-page booklet on its nonexide wood blocks for use on city streets, bridge floors, piers and in shops. A number of railways, among which are the Philadelphia & Reading and the West Jersey & Seashore, are using these wood blocks for floors in shops and car houses.

Rickard & Sloan, Inc., New York, N. Y., advertising agents, have issued an attractive 24-page booklet on productive publicity, "A Mark and Its Import." The booklet contains reproductions of a large number of two and three-colored plates of catalogs, pamphlets and bulletins which this company has furnished its customers, together with methods of planning advertising campaigns, catalogs, bulletins, etc., for publicity purposes.

Esterline Company, Indianapolis, Ind., is distributing catalog No. 369, describing its graphic instruments, permanent magnets and other electrical specialties. Illustrations and wiring diagrams of graphic meters and clocks are given, and also detailed descriptions of the parts used in their manufacture. Some of the specialties listed are switchboard-type voltage multipliers, transformers, speed recorders and shunts. Several pages contain tables giving the kilowatt capacities of the different types of meters for different currents and voltages, and also tables of dimensions of portable, wall or switchboard-type meters.

Electric Railway Journal

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REDUCING THE TRANSFERS

It has been well said that the steam railroads have an advantage over the urban electric railways in the ease with which they can raise fares. The electric roads not only have to make a jump of 20 per cent from 5 cents to 6 cents, but they have to substitute an inconvenient fare for one which is not only convenient but has been in use so long that everyone has become accustomed to it. To avoid this objection the zone system and a charge of 1 cent for transfers have been suggested, but each plan has certain disadvantages. Still another plan is to reduce the number of places at which transfers are permitted. It is a fact which can be verified from the schedules of almost any large company that under the existing transfer system many rides are possible at an absurdly low charge per mile. We admit that any individual case is apt to be complicated by the existence of through routes, requirements in the way of service on connecting lines, etc. Nevertheless we believe that it would not be difficult to devise a transfer system which would grant the privilege to the short rider only on the through route, and to decline it to the long distance passenger, if such a plan was legally permitted. Most roads in the past have been so over-generous with transfers that we believe the commissions might look with favor upon this method of increasing fares, should a definite plan be devised which would be practicable for each particular case.

PROHIBITION AND THE CITY RAILWAYS

Iowa went "dry" last year—long enough ago so that the residents of this wealthy farming state may begin to determine the results. It seems a rather remote step from prohibition to the street railways, yet they appear to be sharing in the net returns. In Des Moines, for instance, there has been a noticeable increase in the amount of evening traffic on the city cars. This is attributed to the effect of the law, and incidentally indicates that the moving picture theaters are conducive to greater transportation earnings than the saloons. Many men who formerly stopped at the corner bar on their way home from work and spent a dime or 20 cents are now going directly home and then coming back downtown after supper and bringing their wives and perhaps their children to see a picture show. Where the street car company formerly received a nickel from them to carry them home, it now earns an additional 20 or 30 cents. Human beings will have amusement, and if the bottle variety is lost to common usage, the movie is often the more wholesome entertainment to which they will turn, and the railways profit by the change for the better.

THE MILWAUKEE'S LENGTHENED ENGINE DIVISIONS

In our first issue of the current year mention was made of the promising outlook for new steam-railroad electrifications, and the first of the projects which were germinating during the past year has already taken definite form. This is the plan for extension of electric operation on the Chicago, Milwaukee & St. Paul Railway to the west of the present electric zone. According to the report, which is outlined on another page of this issue, the 220 miles of electrified track included in the immediate program will extend over the two engine divisions east of Seattle, leaving a gap of about an equal distance between the new zone and the Western terminus of the existing one. The primary object, obviously, is the provision of electric power over the Cascade mountains, leaving the comparatively level line across the fertile plain of Eastern Washington to be served by steam. In the latter region, of course, the need for the economies of the electric locomotive is less emphasized, but that the gap will be closed within a relatively short time goes almost without saying. What the Milwaukee road has done is the demonstration, on a gigantic scale, of the savings to be effected by long-distance operation of electric locomotives, and the results, while not available in actual figures, have been shown to be successful by the mere fact of the present plan for an extension of the system. During the past year of trial the economies have been obtained with electric locomotives running over engine divisions only twice as long as under steam operation, and the possibilities that will exist for cutting out terminal losses, when the whole 900 miles of line are electrified and permit still longer runs, are fairly staggering to the imagination.

PREPARING FOR LABOR CONFERENCES

On a certain electric railway the representatives of the employees' union conduct careful rehearsals before sitting down at a conference with company officials. One set of delegates takes the men's side; another set puts itself in the places of the company officials, and the pros and cons are debated with red-hot enthusiasm. This is a form of preparedness that might well be practised by railway officials as well. The energy and time expended by company representatives in considering the issues from every angle would be used to an exceedingly good end. The outlining of the company's side in debate would unquestionably tend toward a better understanding of its position in the subsequent negotiations, and the more that was done to secure the viewpoint of the employees the more likelihood there would be of a prompt and just settlement. In other words, we are inclined to think that a well-prepared and able management could secure concessions from a well-prepared union delegation that could not be obtained by unprepared officials in dealing with an ill-informed group of employees. Of course, the well-prepared group will do its best for its cause, but the basis of negotiation is certainly improved with fuller knowledge gained from discussion and close application to the conditions of each problem.

A FUNDAMENTAL OF WOOD PRESERVATION A note was sounded throughout all of the sessions of the Wood-Preservers' convention of last week to the effect that treatment of timber, to be successful, must be accompanied by proper handling of the wood before and after treatment. To the layman attending technical sessions of a highly-specialized industry the expression of such an elementary formula is interesting, but it is at the same time surprising enough to make a very definite impression. It appears that not even wood preservers have universally recognized the inability of any commercial process of preservative treatment to stop decay that has once gained a foothold. The application of preservatives merely establishes a protective covering around the outside of the stick, and if this covering is interrupted at any point or surrounds a decayed spot that may subsequently spread its infection from within, the treatment is merely a waste of money. In practical application this principle demands that timber, as soon as it is cut, must be stored in a clean, dry spot and must be piled so that air has free access to all sides of every piece. In fact, a stick of wood seems quite as subject to contagious disease as any mammal and must be protected from the attacks of germs with equal or even greater care. After treatment the same rule applies, and if the treated timber is sawed or bored and the untreated interior exposed, decay will follow just about as fast as if no preservative had been applied. This fundamental principle is, apparently, more often violated than any of the general rules in timber preservation, and from this cause, no doubt, come a majority of the apparently inexplicable cases where treated wood fails to last in service.

DEVELOPMENT OF TRAFFIC

There are two ways of increasing the net earnings of any company. One of these is to increase the gross receipts; the other is to decrease the operating expenses. Under present conditions, the former seems the more practicable, and it is the plan urged by four traffic managers who contribute to a symposium this week on the "Development of Traffic."

It is obvious that any electric railway devoted purely to passenger business, especially that traffic which comes from absolutely necessary riding, has a low service factor, and almost any way in which this factor can be increased means greater net receipts. The investment in track and for right-of-way, in the case of an interurban road, is a very large proportion of the total investment on every road, but if this property is idle, or practically idle, for from six to twelve hours during the twenty-four the railway is not making the most of its opportunities. This is the great argument in favor of greater traffic development, especially in the direction of less-than-carload freight, which can be hauled during those times when the power station and track would otherwise be practically unused.

The business is one which, of course, has its own characteristics. It must be developed along different lines than the haulage of passengers, and to secure the best results some additional investment is necessary in the way of equipment, and some more is desirable in the way of terminals and perhaps for sidings and cut-offs. But such investment is small compared with that in the entire plant, and by a judicious selection of the kind of freight to be solicited so that it will include that on which the highest rates are paid, most companies should be able to develop a satisfactory additional income. Just what to do and how to do it form the subject of the articles already mentioned, and we believe that the testimony there given as to results which have been secured on the four roads concerned should be of value to many companies.

STATE TAX FOR CITY-OWNED LINES

The California State Board of Equalization, as mentioned in a news note last week, has made a recommendation that has quite an important bearing upon the question of governmental fairness to privately-owned utilities in California. In short, the board urges the enactment of a law by which municipalities owning and operating public utilities shall be required to report to it and pay a tax on gross operating revenues similar to that imposed on privately-owned companies. This proposal has special application to the electric railway field on account of the municipal lines operated in San Francisco. It should be understood, of course, that the lack of such provision heretofore has not served to inflate the net profit of the municipal system, for although it pays no taxes it is required by charter provisions to take into account charges for taxes, city interdepartmental work and insurance, so as to make possible a comparison of its results with those of private operation. For example, the latest complete report of the municipal lines includes in income deductions an item of $86,029 for the State franchise tax of 5¼ per cent upon gross operating revenue. This tax has not been paid to the State, however, and this fact, in the opinion of the Board of Equalization, throws an unfair burden upon people in other parts of the State.

As we understand it, the authorities on taxation in California are now somewhat uncertain as to whether special legislation of this kind is necessary. The general tax law provides that all "properties" owned by the State, counties and municipalities are exempt from taxation, but five years ago an amendment was passed to the effect that all utilities of designated kinds are to be taxed by the State on the basis of gross operating revenue. In other words, municipally-owned utilities are not specifically exempted. It might, therefore, be legal simply to levy the State tax on the municipal utilities, but this might involve long litigation as to the intent of the lawmakers, which the direct passage of a new bill would avoid. Certainly there is no sound reason why the municipally-owned utilities should not bear their just proportion of the State tax, and with the equity of taxing them irrefutable the law should be made specific to this effect.

ACCIDENT PREVENTION VIA THE GENERAL MOVIES

Moving pictures have played a most important part in many recent accident prevention campaigns exemplifying the value of the safety-first idea. Such displays have stimulated interest among street railway employees, their families and friends, and the good which ocular evidence of the penalties of carelessness has effected cannot be measured. The wisdom of prevention through every possible agency needs no demonstration, and it is such a wholesome thing that even the general moving-picture houses are willing to devote some of their "footage" to this good cause.

From the standpoint of the operating man, however, it is desirable that any demonstrations of the dangers of boarding cars when in motion, alighting while facing the wrong way, holding bundles improperly, failing to look out for cars and automobiles on either side of the street center line, etc., shall be not only technically correct from the railway aspect of the case, but that the maximum impression shall be made on the observer. In a photoplay display recently viewed which has the laudable object of warning the public against its own carelessness in street car use, the "play-up" of the accident in almost every case was so weak as to give the onlooker the impression that only trifling injuries result from carelessness or a criminal disregard of the rights of others on the street. The apparent victims in practically every instance appeared to suffer little more harm than black-and-blue spots and generally walked away from the scene with surprising alacrity.

No sensible operating man wishes to overdo the job in demonstrating the dangers of certain practices on the part of the public, but there is room for some useful co-operation between the "movie" director and the transportation man in properly staging such scenes. If a boarding accident is to be depicted, it is better to use a type of car permitting entrance while it is in motion than to attempt to illustrate the affair by a piece of rolling stock which has been specially designed to prevent precisely this kind of accident, and which, in fact, makes boarding while the doors and steps are closed almost an impossibility. Then, too, the resources of the camera man in adjusting the speed of cranking the film to the requirements of the particular illusion sought should enable more realistic speed and tumbling effects to be attained in the illustration of some kinds of accidents, notably those resulting from the failure to look for the oncoming car or motor-vehicle in the opposite direction to that previously taken, and this without exposing the actors to increased personal risk. And finally, when the accident is depicted, would it not add much to the value of the film to include one or two hospital and convalescence scenes to clinch the impression of the price paid for carelessness?

In the industrial field, moving pictures of accidents often go so far as to show the permanent injuries received through heedlessness and perhaps hint at lifelong disabilities and hindrances. Certainly the general public needs to be fully warned of the perils of a carelessness which no railway company can control outside its own ranks and which adds so much yearly to the burdens of operating men from the humblest switchman to the highest executive. Thus far, the connection between the electric railway industry and the moving-picture world has been of a pioneer character, but the future is likely to witness a closer relationship as the demand for industrial and pseudo-scientific backgrounds for scenarios increases and as railway managers realize the immense power for suggestion resident in the modern film.

ANOTHER ADVANCE MADE

Gradually the New York courts are interpreting the public service law and in so doing are confirming the title of the commissions to wide discretionary powers in increasing as well as decreasing utility rates, even when such increases are counter to existing statutes or municipal agreements. Some time ago, it will be recalled, the New York Court of Appeals declared in the Ulster & Delaware case that the Second District Commission had power to raise the mileage book rate from 2 cents per mile which had been deemed sacrosanct.

Now, under a decision by the Appellate Division of the Supreme Court, the same commission has been told that it should not be estopped by local franchise provisions from fixing reasonable rates. In 1915, as explained elsewhere, the commission denied the petition of the New York & North Shore Traction Company for a fare of 15 cents, on the ground that the municipal consent for construction stipulated a 10-cent fare and no increase could be made without the consent of the local authorities. This, the court now holds, is not true. Although the constitutional provision in New York requiring municipal consent for franchises is a restriction upon the Legislature, the constitutional clauses regarding legislative power over rates and the delegated commission power over rates form a restriction upon local authorities in regard to attaching conditions to fix the rates. Thus, although in practice a fare might be agreed upon by utility and municipality in instituting service, the public service commission law provides for the later adjustment of such fare up or down as reason and justice demand. This is as it should be, for to determine fair rates is not the proper duty of either party directly concerned but of the impartial body to which the Legislature has delegated its power.

By a singular coincidence we are this week again calling attention to the remarkably well-equipped and conducted organization of the very commission concerned in these cases. This organization will undoubtedly be of great assistance to the commission in fulfilling its duty of complete regulation along the line now indicated by the court. Hereafter, we are sure, the commission will feel more self-assurance as to its power of determining all rate questions according to the merits of each particular case.

How a Commission Works

With a Description of the Divisions of Statistics and Accounts, Capitalization and Tariffs and of the Central Clerical Office, This Article Concludes the Story of the Public Service Commission for the Second District of New York

FOR the purpose of showing the extent to which the machinery of regulation has been thus far developed in this country, the ELECTRIC RAILWAY JOURNAL began in its issue of Dec. 30, 1915, a description of the organization, cost and work of the Public Service Commission for the Second District of New York. This first part, however, covered only those organization units consisting of the three leading groups—the commissioners themselves, their legal and confidential staff, and the administrative division—and the five groups that supervise grade crossings and separate classes of utilities, *viz.*, electric railways; light, heat and power companies; steam railroads, and telegraph and telephone companies. There are four other groups, which are in general concerned with all classes of utilities. These—the divisions of statistics and accounts, capitalization and tariffs, and the central clerical office—are described in this second and final part of the article.

DIVISION OF STATISTICS AND ACCOUNTS

The personnel, general duties and salaries of the officials in the division of statistics and accounts are as follows:

Title	Duties	Salary
	ADMINISTRATIVE GROUP	
Statistician in Charge:	General supervision, planning, correspondence and technical review	$5,000
Assistant Chief Statistician:	Assistance in supervision and in critical examinations devolving upon staff shown under second group	2,400
	CRITICAL EXAMINATION GROUP	
Telephone Accountant:	Examination of reports of telephone and other corporations	2,500
Junior Statistician:	Examination of reports and care of miscellaneous related routine, as well as tabulation work which ordinarily devolves upon the second group	1,800
Assistant Examiner:	Critical examination of reports and revision of forms	1,800
Junior Accountant:	Critical examination of reports	1,500
Bookkeeper:	Critical examination of reports and assistance on tabulations	1,500
	TABULATION GROUP	
Statistical Clerk and Assistant Examiner:	Tabulation of results of critical examinations and assistance in examination work	1,080
Clerk:	Examination of reports and related detail in connection with tabulations	1,080
Clerks (2):	Examination of reports and related detail in connection with tabulations	900
	CLERICAL ROUTINE GROUP	
Stenographer:	General supervision of clerical routine and other necessary details	1,800
Stenographers (2):	Stenographic routine, including typing of tables, etc.	1,200
Clerk:	Typewriting, operation of comptometer, copying, etc.	1,080
Clerk:	Filing correspondence and other clerical routine	900
Index and Filing Clerk:	Filing correspondence and other clerical routine	900

The foregoing groups represent reasonably distinct sections charged with the performance of the classes of work indicated. Changes in the assignment of employees, however, from one class of technical work to another is of almost daily occurrence, thus making possible the training of all-around men.

The division of statistics and accounts is charged with the examination of periodical (*i.e.*, annual and special) reports required from utilities. This work falls under the following natural heads: the formulation of classifications, accounting forms, interpretations and instructions to govern the preparation of corporation reports; the critical examination of such reports to see that the rules are followed; the tabulation work for commission statistical reports; the publication of these reports and the general furnishing of information, and clerical and business routine.

1. *Formulation of Classifications, Etc.:*

The scope of the work under this head can be judged by a glance at past developments. Since the formation of the commission the head of the division of statistics and accounts, acting in conjunction with the heads of other divisions, has prepared numerous regulations and forms that have been sent out to utilities and other interested parties. Among the pamphlets of instructions sent to corporations are those dealing with the uniform system of accounts for electrical, gas, telephone and electric railway corporations. Official classifications and forms covering electrical and gas corporations, natural gas corporations, telephone companies, telegraph and cable corporations, steam railroads and electric railways have also been sent out. Besides such general work the division stands ready at all times to interpret its rulings, etc., for individual companies.

2. *Critical Examination of Corporation Reports:*

The first point of interest in connection with critical examination work is, of course, the requirements of the commission in regard to the submission of reports by the utilities within its jurisdiction. The rules with respect to the time and the manner of sending in reports may be indicated simply as follows: Annual reports on prescribed forms from all corporations, and quarterly reports on prescribed forms from steam railroads. The quarterly reports are regarded as a supplementary requirement, each steam railroad being compelled to submit an annual report as well. For this reason, the examination of quarterly reports includes only certain elements of the examination of annual reports.

There are four well-marked steps involved in the examination of annual reports, the first two being of a rather preliminary nature. The first step involves a mechanical comparison of the basic figures of the report under examination with the totals of the preceding year's report. The second step consists in verifying additions, subtractions, multiplications, etc., in the new report, being thus a purely mathematical checking to determine accuracy. The first advanced step is a cross-check of analogous items in different financial statements to determine their correspondence. For instance, items on a balance sheet are checked with the totals of the several supporting schedules. As the examination progresses, corrections are made on a form designated as "memorandum of errors," which contains captions facilitating the entry of facts "as reported" and as the examiner thinks they should be. This form is reproduced on page 198. The second and last advanced step is the critical examination itself, which may include a preliminary and a final review or only one examination. In either case the intention is to summarize the errors and discrepancies discovered and to prepare a report to the corporation at fault.

3. *Tabulation Work for Commission Statistical Reports:*

The third class of work covers the classification and tabulation of the results of the examinations in the form of an abstract, which is the basis of the commission's statistical reports. As in the examination of the reports, there are certain well defined steps to be followed. The first is the preparation of the original tabulation, which involves the drawing-off of figures from the annual reports of distinct classes of corporations upon improvised financial statements agreeing in classification with the forms used by such corporations. Unimportant financial data, of course, are not abstracted. The second step is the verification of the original tabulation by checking back the items to the reports to determine the correctness of the posting. The next two steps are the verification of all computations on the tabulation itself, and the comparison of analogous items in different tables to obtain a cross check. After these comes an important feature of the work, the preparation of notes to explain items on the abstract that are of doubtful meaning. The last step is that of typewriting and checking the tables. These steps are also followed in the abstracting of quarterly reports, but the process is abbreviated because of the limited scope of the examination.

"BEHIND THE SCENES"

An editorial under this title, published in the ELECTRIC RAILWAY JOURNAL of Dec. 30, urged utility operators to learn regulatory practices as well as theory. They should not, it was said, confine their attention to the words of the principals in the limelight, the commissioners, but should be acquainted with the diversified work behind the scenes. To this end an article was presented on the same date to show how the many assistants of the commissioners for the Second District of New York set the stage for the regulation of each class of utility. Now, in addition, this journal is taking its readers to the "property room," where the accumulated records and data of the commission are held ready for instant use. A remarkable system it all is—utility officials should not miss the opportunity to see it.

4. *Publication of Commission Statistical Reports and Furnishing of Information:*

The actual printing of commission statistical reports and all mechanical details relating thereto are referred to later under the central clerical division of the commission's organization. The work done under the division of statistics and accounts relates only to the final preparation of reports as a basis for printing. The furnishing of information by this division, however, consists of compiling statements in tabular or other form as a basis for submission to corporations or other parties, furnishing personal assistance to those who call at the office to inquire about the financial condition of corporations in which they may be interested, forwarding printed or manuscript material for information purposes to the public generally, and assisting the other divisions of the commission by making its information available to them.

5. *Clerical and Business Routine:*

The last section of the division's work concerns the clerical and business routine of its office. This, in general, falls in the following groups: Handling and filing correspondence other than reports; handling and filing report material; stenographic and typing routine involved in the preparation of reports, and correspondence.

DIVISION OF CAPITALIZATION

The division of capitalization is engaged almost exclusively in the examination of books, papers and records of companies asking for authority to issue securities. A utility presents to the commission an application stating in detail how the money is to be used, and from this application a preliminary analysis is made. If the matters involved are varied and complicated, the commission holds a preliminary hearing to learn fully what the directors of the utility propose to do. After this hearing, the case is referred to the division of capitalization for examination. Its investigation involves, when necessary, a thorough examination of the transactions of the corporation during the entire period of its existence. While this is going on, an inventory of all property is required from the utility, and the examiner analyzes this with the view of identifying the particular items of property which are shown on the books as having been acquired and included in the capital accounts. After the work of examining the records is finished, the inventory is turned over to an engineer in the proper division, who makes an appraisal and reports thereon. The results are all combined in a final report showing the actual condition of the corporation. This is submitted to the corporation, which then signifies its assent or makes its objections. If necessary, a hearing is held in the matter. If the securities are authorized, the division follows up the case so that it can tell at any time the amount of authorized securities sold and the application of the proceeds thereof to dates within six and three months respectively.

The leading employee in the division of capitalization is the chief ($4,000), under whom is the senior examiner ($2,500), one examiner ($2,250), one examiner and one examiner of accounts ($2,000), four examiners ($1,800), two assistant examiners of accounts ($1,500) and two assistant examiners ($1,080). Besides these, there are a junior accountant ($1,080), two stenographers ($1,200 and $1,080) and two copyists ($900 and $600). The chief analyzes petitions referred to the division, supervises and directs the examiners in the field, and prepares reports embracing the results of such examinations. The senior examiner, the examiner of accounts and five other examiners make detailed examinations of the books and accounts, verify liabilities by comparison with the original vouchers and documents, eliminate unnecessary items and redistribute the accounts as required by the official classifications. They also prepare correct financial and statistical statements, make detailed lists of property for inspection by the commission's engineers and report in detail on each company examined. It is customary to assign any one of these examiners to a particular case, with assistants as necessary. To one of the examiners of the $1,800 class is assigned the special duty of supervising the stenographic preparation of reports, recording them and compiling data for the commission's orders. The four assistants and the junior accountant do the minor part of the work, such as checking, verifying schedules, examining vouchers, etc.

Of the 928 utilities under the jurisdiction of the commission on Dec. 31, 1915, there may be excluded, as far as supervision over capitalization is concerned, more than 200 municipalities, unincorporated persons, etc., with the capitalization of which the commission has little or nothing to do. This leaves about 700 corporations which may reasonably be expected to require sooner or later an examination of their books in connection with security applications. Of these companies, there are 137 whose accounts had been examined by this division up to Jan. 1, 1916. Each company had its entire capitalization reviewed by the commission, and in connection with subsequent applications for authority to issue securities it will be necessary only to bring these examinations up to date.

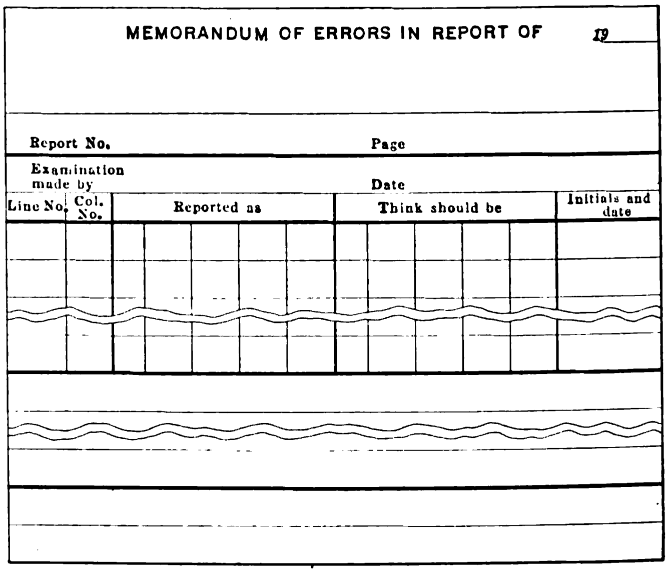
Tariff Division

The work of the tariff division is mainly to prepare, for the approval of the commission, rules governing the form of tariff schedules and the procedure for filing the same, as well as to keep all schedules filed. This division now also handles traffic inspection at Buffalo with reference to freight congestion. The employees consist of the following: Chief of division ($4,000), traffic inspector ($2,400), chief clerk ($2,000), senior tariff clerk ($1,800), stenographer-and-tariff clerk ($1,500), tariff clerk ($1,200), bookkeeper ($1,200), stenographer ($1,200) and clerk ($1,080). The chief of the division handles directly the correspondence relating to administrative work, inquiries and informal complaints, and issues under the direction of the commission, orders permitting tariff changes on short notice, suspension of tariffs, etc. He also acts in an advisory capacity to the commission and represents it in tariff conferences. The chief clerk attends to the classification and distribution of mail, the preparation of memoranda on requests for information, and the supervision of the filing of rate schedules. In the absence of the chief he is in charge of the division. Other important organization details are included below in describing the progress of the work, the minor clerks being most concerned with the filing and the indexing.

During 1915 the schedules of rates filed for the various utilities numbered 18,272, of which 112 were returned as unlawful. There were also 579 authorizations of various kinds relating to rate and fare schedules and 123 contracts of gas companies and electrical companies, making the total filing for the year 18,862 and the total up to Jan. 1, 1916, 180,959. In the electric railway group the new tariffs filed were ninety-six for freight and 249 for passengers, the latter number including 192 short-term excursion tariffs. In addition, there were fifty-five supplements to freight tariffs and fifty-one supplements to passenger tariffs filed. Freight tariffs numbering 100 and passenger tariffs numbering 239 were cancelled.

A considerable amount of work is involved in the handling of all these rate schedules. They are received by the stenographer-and-tariff clerk, who reviews them to see that they are accompanied by a proper letter of transmittal, and that postage is inclosed if a receipt is desired. They are handed to a clerk, who stamps the date on them and enters them in the receipt book. A specimen page of this is shown in the illustration on page 199. The schedules are then sent to the chief clerk, who examines them to see whether proper notice is given as to the effective date and whether they generally comply with the commission's rules as to arrangement. They are next returned to the clerk to be sorted according to the various corporations, the gas, electric, telephone and telegraph schedules being given to the stenographer-and-tariff clerk and the common carrier schedules to the senior tariff clerk. If the new schedule is an amendment to or a superseding issue of the schedule on file, a comparison is made to ascertain what changes have taken place. As the schedules pass through the described route, a memorandum is made if any defect is discovered, and the defective schedules are sent to the chief of the division to be taken up with the corporations for correction.

Besides this routine work in handling rate schedules, the tariff division each week publishes a tariff bulletin, which is edited by the senior tariff clerk. A specimen copy of this is reproduced on page 199. These bulletins are the means whereby the public is kept informed as to changes in rates, etc. They are free to the public. Each weekly issue is ready for delivery, one to each applicant, at the office of the commission in Albany on Monday morning. The bulletins are regularly mailed free to commercial organizations, trade publications, and the daily and weekly press, and they will also be mailed periodically to shippers or carriers upon written request if the necessary postage is supplied. In 1915 the tariff bulletins contained 8138 items, which involved the examination of 15,312 schedules.


MEMORANDUM OF ERRORS IN REPORT OF 19

Report No. Page

Examination made by Date

Line No.	Col. No.	Reported as	Think should be	Initials and date

COMMISSION REGULATION—FORM FOR CORRECTIONS USED IN DIVISION OF STATISTICS AND ACCOUNTS

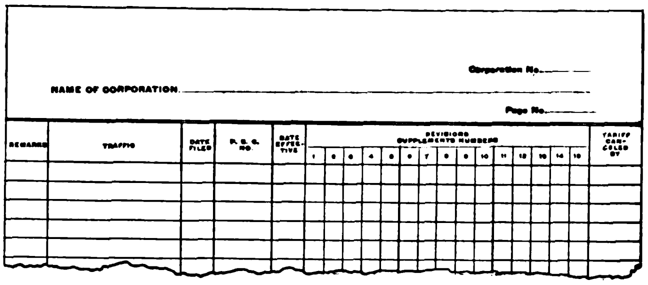
The work of the tariff division, in order to be effective, requires an accurate system of filing. The present file case contains 222 drawers (10½ in. x 12½ in. x 24 in.), arranged in sections six drawers high. These sections show on their face the section numbers and the numbers of the filing corporations whose tariffs are contained therein. All tariffs are numbered consecutively by the commission and filed accordingly. Certain drawers contain tariffs in effect, while others contain those cancelled or superseded. The index case takes cards 3 in. x 5 in.

The intricate character of the indexing is well shown by the five-division system for steam railroad cards. First, there is a road card showing the name of the corporation; second, cards showing the form and the number of powers of attorney and concurrences giving the road authority to issue joint tariffs, and third, a division card headed "Local Rates." Back of this are cards showing for each tariff the file-case section, the road number, the point from and to which it applies, the history of rates by tariff numbers, and the dates effective. The fourth division of the scheme of indexing provides for a division card headed "Miscellaneous Schedules." Back of this are filed the cards indexing, in the same manner as class rate tariffs, all the miscellaneous schedules for back-haul charges, stock-feeding and watering charges, switching charges, etc. These miscellaneous schedule cards are filed alphabetically according to application behind sub-division letter cards. The fifth index division is for "Joint Rates." This group includes sub-division cards numbered to represent the road numbers of carriers, behind which are filed the index cards for joint rates. Moreover, all articles for which commodity rates are provided are indexed by this division as to article. Such indexing requires the making of from one to approximately 500 cards for a tariff.

Before leaving this division a mention should be made of its work in inspecting freight congestion. One employee, the traffic inspector, is located at Buffalo, where congestion is more prevalent and requires prompt investigation and provisions for relief. He looks after complaints and does such field work as is from time to time assigned to him. He also makes a number of investigations of the movements of less-than-carload shipments of freight between points on trunk lines. These inspections operate to keep the carriers' service uniform and to obviate complaints against delays which occur when carriers do not maintain their train schedules.

CENTRAL CLERICAL OFFICE

The work in the central clerical office is so diversified that it can probably be best explained by describing first the clerical employees, with their respective duties, and then important points in connection with the most involved part of the work, the filing and indexing system of the commission. The employees in this section may be classified in five groups: General, accounting, publishing, filing and stenographic.



Corporation No.

NAME OF CORPORATION

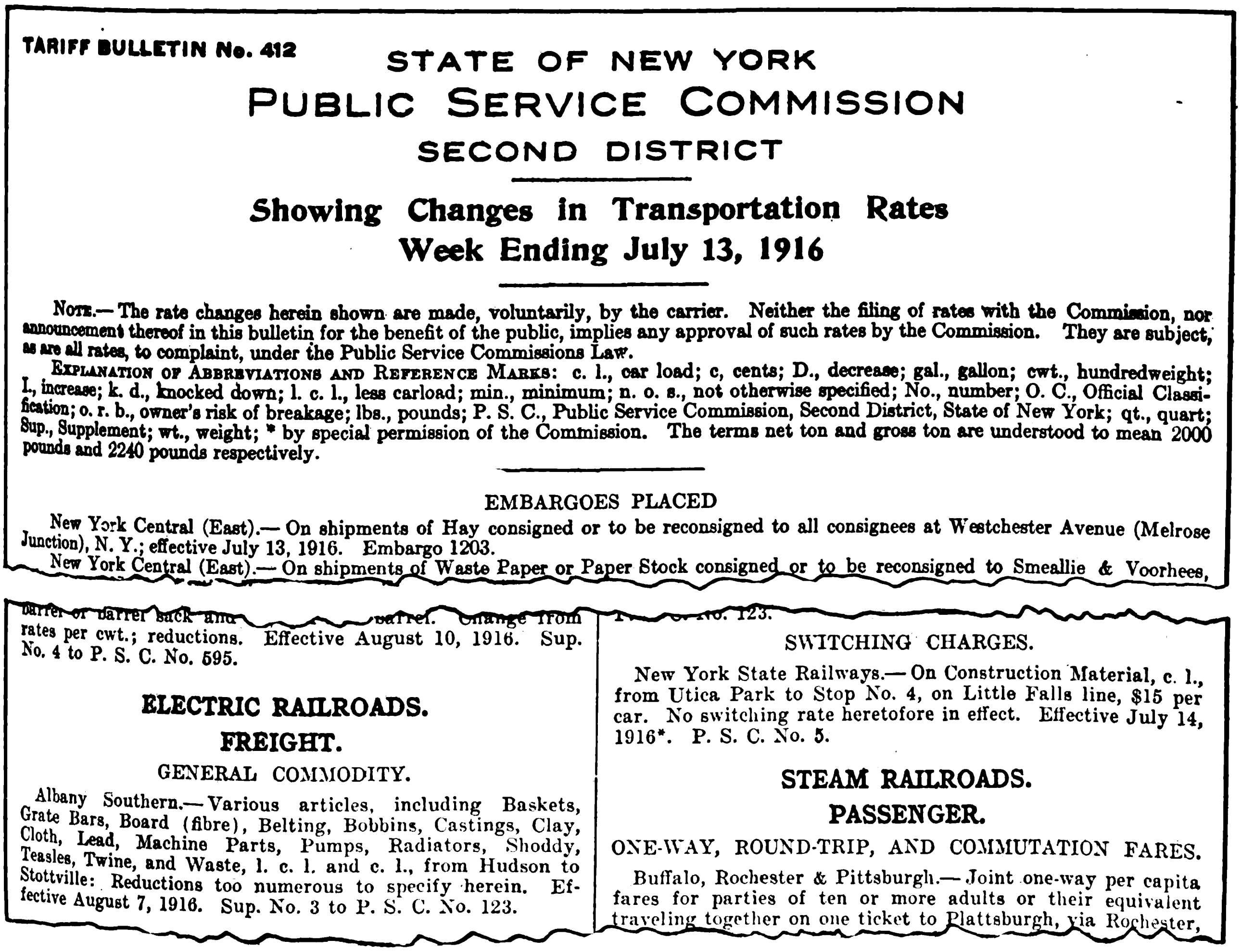
Page No.

REMARKS	TRAFFIC	DATE FILED	P. S. C. NO.	DATE EFFECTIVE	REVISIONS SUPPLEMENTS NUMBERS															TARIFF CANCELED BY
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	

COMMISSION REGULATION—SPECIMEN PAGE FROM RECEIPT BOOK IN TARIFF DIVISION

1. *General Clerical Employees:*

The chief official in the general office is the executive clerk ($5,000), whose duties are many and varied. In general he writes memoranda to the commissioners as to the contents of petitions, complaints and answers, attends to the serving of orders by mail, sends out notices of hearings, draws some orders and conducts general correspondence. He now has three regularly assigned stenographers, and a large part of the time two or three additional stenographers work for him. The chief clerk of records ($2,500) follows up all orders to see that they have been complied with and reports thereon to the commission. He also has the custody of traffic contracts between carriers and is responsible for the indexing and filing of these. For certain annual reports



TARIFF BULLETIN No. 412

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION
SECOND DISTRICT

Showing Changes in Transportation Rates
Week Ending July 13, 1916

NOTE.—The rate changes herein shown are made, voluntarily, by the carrier. Neither the filing of rates with the Commission, nor announcement thereof in this bulletin for the benefit of the public, implies any approval of such rates by the Commission. They are subject, as are all rates, to complaint, under the Public Service Commissions Law.

EXPLANATION OF ABBREVIATIONS AND REFERENCE MARKS: c. l., car load; c, cents; D., decrease; gal., gallon; cwt., hundredweight; I., increase; k. d., knocked down; l. c. l., less carload; min., minimum; n. o. s., not otherwise specified; No., number; O. C., Official Classification; o. r. b., owner's risk of breakage; lbs., pounds; P. S. C., Public Service Commission, Second District, State of New York; qt., quart; Sup., Supplement; wt., weight; * by special permission of the Commission. The terms net ton and gross ton are understood to mean 2000 pounds and 2240 pounds respectively.

EMBARGOES PLACED

New York Central (East).— On shipments of Hay consigned or to be reconsigned to all consignees at Westchester Avenue (Melrose Junction), N. Y.; effective July 13, 1916. Embargo 1203.

New York Central (East).— On shipments of Waste Paper or Paper Stock consigned or to be reconsigned to Smeallie & Voorhees,

rates per cwt.; reductions. Effective August 10, 1916. Sup. No. 4 to P. S. C. No. 595.

ELECTRIC RAILROADS.

FREIGHT.

GENERAL COMMODITY.

Albany Southern.— Various articles, including Baskets, Grate Bars, Board (fibre), Belting, Bobbins, Castings, Clay, Cloth, Lead, Machine Parts, Pumps, Radiators, Shoddy, Teasles, Twine, and Waste, l. c. l. and c. l., from Hudson to Stottville: Reductions too numerous to specify herein. Effective August 7, 1916. Sup. No. 3 to P. S. C. No. 123.

SWITCHING CHARGES.

New York State Railways.— On Construction Material, c. l., from Utica Park to Stop No. 4, on Little Falls line, $15 per car. No switching rate heretofore in effect. Effective July 14, 1916*. P. S. C. No. 5.

STEAM RAILROADS.

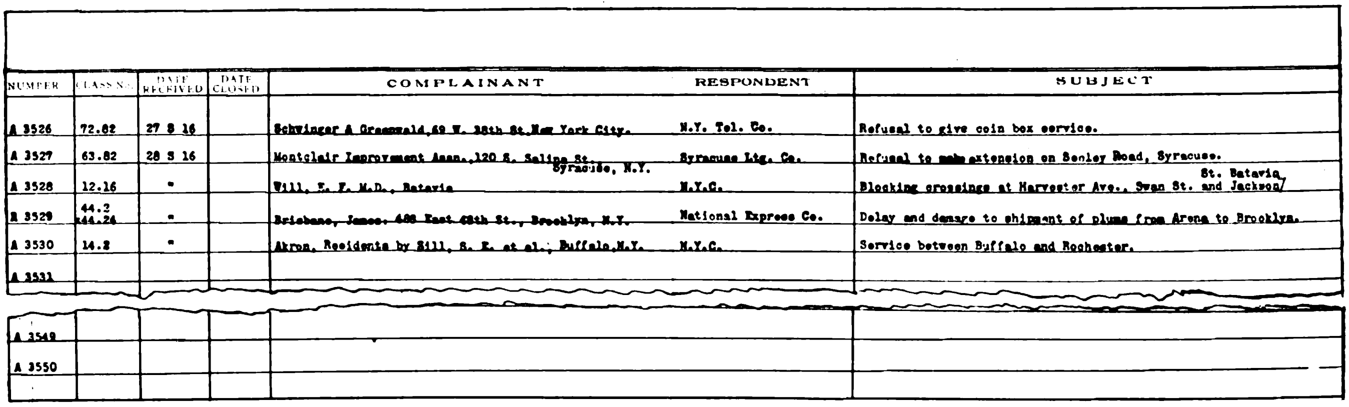
PASSENGER.

ONE-WAY, ROUND-TRIP, AND COMMUTATION FARES.

Buffalo, Rochester & Pittsburgh.— Joint one-way per capita fares for parties of ten or more adults or their equivalent traveling together on one ticket to Plattsburgh, via Rochester,

COMMISSION REGULATION—SECTION OF WEEKLY BULLETIN ISSUED TO INFORM PUBLIC AS TO CHANGES IN RATES of the commission he prepares statements covering the history and organization of the various corporations. The hearing and publicity clerk ($2,500) prepares statements in regard to commission decisions for the daily, weekly and technical press.

The general clerical section of this division has assigned to it four male stenographers, one of whom is temporarily assigned to the division of statistics and accounts. The remaining three perform certain work in the clerical department in addition to their stenographic routine. One stenographer ($2,000) supervises the opening and stamping of all incoming mail and assists in the sorting and distributing thereof, and he also reads all outgoing correspondence for typographical and grammatical errors and reports any necessary rewriting to the secretary. In a general way, he is responsible for the mailing work of the commission. Of the two other stenographers ($1,500), one receives the follow-up matter from the filing department each day and sees that it is sent through the secretary's office to the proper individuals, while the other distributes the hearings for the calendar and keeps a chronological record of them, as well as a register showing the status of all complaints before the commission. There are two clerks ($1,500), one of whom keeps a docket record of all formal cases. The other clerk is a general utility employee for the office, assisting and substituting for the docket clerk and the auditor, acting as librarian for the commission and assisting in the compilation of statistics for the annual report of the commission.



NUMBER	CLASS No.	DATE RECEIVED	DATE CLOSED	COMPLAINANT	RESPONDENT	SUBJECT
A 3526	72.82	27 8 16		Schwinger & Greenwald, 69 W. 38th St. New York City.	N.Y. Tel. Co.	Refusal to give coin box service.
A 3527	63.82	28 8 16		Montclair Improvement Assn., 120 S. Salina St. Syracuse, N.Y.	Syracuse Ltg. Co.	Refusal to make extension on Seeley Road, Syracuse.
A 3528	12.16	″		Will, E. F. M.D., Batavia	N.Y.C.	Blocking crossings at Harvester Ave., Swan St. and Jackson St. Batavia.
A 3529	44.2 44.24	″		Brisbane, James. 488 East 48th St., Brooklyn, N.Y.	National Express Co.	Delay and damage to shipment of plums from Arena to Brooklyn.
A 3530	14.2	″		Akron, Residents by Sill, S. E. et al., Buffalo, N.Y.	N.Y.C.	Service between Buffalo and Rochester.
A 3531						
A 3549						
A 3550						

COMMISSION REGULATION—SPECIMEN PAGE FROM ACCESSION BOOK USED IN FILING DEPARTMENT FOR RECORDING CORRESPONDENCE COMPLAINTS

A messenger ($1,080) is in charge of the supply room and under the direction of the secretary purchases and distributes office and typewriter supplies. He has the custody of all annual reports and bound volumes and directs the mailing of these. A laborer ($2 a day) assists this employee in the packing of reports, etc. Two junior clerks ($720), one junior clerk ($600) and two pages ($480) open, stamp and deliver the incoming mail and also seal and stamp all outgoing matter. These employees are general office and errand boys for the commission. There is also one telephone operator ($900), and a janitorial force consisting of two laborers ($900), one laborer ($720) and one cleaner ($1.25 per day).

The Public Service Commission law requires that the office shall be kept open from 8 a. m. until 11 p. m. On account of this provision there is a night clerk ($1,500), who reports at 5.20 p. m. and remains until 11 p. m. on every working day. He answers the telephone, opens messages and if necessary reports these to the secretary. The duties of an attendant ($600) are the same as those of the preceding employee, except that he works from noon until 11 p. m. on Saturdays and from 8 a. m. until 11 p. m. on Sundays and holidays.

The commission also maintains a section of its general office in Buffalo, which is in charge of an assistant to the secretary ($1,500). He keeps a record of local hearings and their disposition, and receives complaints, etc., for forwarding to the Albany office. This employee is the only one in the Buffalo office, except when other employees of the commission make use of it for convenience.

2. *Accounting Department:*

The employees in the accounting section of the general office consist of the auditor and his clerk. The former keeps all the financial records of the commission, makes up the payroll and relieves the secretary by handling all civil service matters concerning the commission. He is assisted when necessary by his clerk, who is that general utility clerk mentioned under the preceding heading. This clerk is qualified to act in the auditor's absence.

3. *Department of Publication:*

It is the function of this department to edit all reports, bulletins, orders, forms, circulars and other matter that are printed under the authority of the commission. The superintendent ($2,400) is directly responsible for such work. He arranges, revises and edits the material, makes all proper and necessary arrangements with the State printer; settles the details for the printer, such as the size of paper, quality, etc.; makes requisitions for printing, with estimates of approximate cost, and checks and approves the bills. He is assisted by a proofreader ($1,080) and a clerk ($900).

4. *Filing Department:*

The filing department is charged with the custody and recording of all papers, reports and correspondence handled in the commission with the exception of special files maintained in some of the divisions on account of expediency. The department contains two filing clerks ($1,500), one filing clerk ($1,200) and one clerk ($1,200). The first two change work each week so that each employee knows the entire scope of the work and is able to take up any part of it in an emergency. One week's work includes classifying the secretary's first morning mail and directing the indexing of it by the clerk; making up the subject matter of most of the correspondence complaints, which are indexed by the clerk; answering requests and getting out from the files old papers asked for; revising the indexing and classification of all formal petitions and complaints, and with the assistance of the clerk filing papers belonging to these. The next week the work covers the collection and dispatch of papers for out-of-town hearings and the supervision of the follow-up system.

The ($1,200) filing clerk has general charge of classifying and indexing the first morning mail other than the secretary's, and all second morning and afternoon mails. She also reads over and classifies all interdepartmental letters and letters of commissioners received without numbers referring to the commission's files. She enters correspondence complaints in an "accession book" and makes filing folders therefor. Each morning she looks up all follow-up material in formal cases, informal complaints and general correspondence. She closes informal complaints by marking folders, index cards and book record with the date of closing and makes a list for the secretary, and she also closes formal cases by marking "closed" on the envelope of the case and the date of closing on the index card.

5. *General Stenographic Force:*

Besides the stenographers previously mentioned in connection with the various divisions and officials, there is in the general office a stenographic force consisting of a chief stenographer ($1,800), one stenographer ($1,500), four stenographers ($1,200), two stenographers ($1,080), one stenographer ($600), and two stenographers ($480). These employees attend to the writing of reports, memoranda, notices and orders of the commission and the making of copies thereof, this work being done chiefly through the executive clerk. They also do the stenographic work for the auditor and the steam railroad and electric railway inspectors, and they assist in the various other divisions when necessary. Some of them do copying work from the commission's files, records and decisions, as requested by attorneys and other interested parties, for which work the commission is reimbursed.

FILING AND INDEXING WORK

As before stated, the most involved part of the work arising in the clerical division occurs in connection with the routine tasks of the filing department, which has to keep in orderly fashion and available shape the multitude of papers and records that come to the commission. The most interesting points have to do with the filing system used, the indexing methods, the charging and follow-up systems and the handling of mail.

1. *Filing System:*

The problem of devising an adequate filing system for the commission was a perplexing one. Finally, however, a highly useful and essentially economical decimal system was worked out, and this is the one now in use. The principle of the system is the assigning to each of the ten digits from 0 to 9 a class heading and then subdividing for subjects as often as necessary. Thus the main headings cover the classes of public utilities under the supervision of the commission, as follows: 0, general; 1, railroads; 2, street railways; 3, ————; 4, express companies; 5, ————; 6, light, heat and power companies; 7, telegraphs and telephones; 8, terminals and warehouses, and 9, ————. Where a dash is shown the number is left open for future use.

These are further divided according to the subjects arising out of the practical working of the commission law. As far as possible, the same figures have been used to show analogous sub-divisions of main heads throughout, as such an arrangement makes for greater mnemonic value. For instance, 11. stands for stocks, bonds, etc., of steam railroads, 21. of street railways, 41. of express companies, and so on throughout the classification. Subdivisions after the decimal point in each group are made as far as needed. For reference purposes the filing department has an alphabetical index to the classification for every possible heading and all synonyms.

The cabinets in the filing department are of steel construction, and are divided into drawers wide and deep enough to hold legal size documents. Under the class number in the file the material is arranged alphabetically, generally under the name of the company and occasionally under the name of the correspondent. In front of each subject there is a large guide card bearing the number and name of the subject, plainly printed on a celluloid tab. On the face of the main guide there is an outline of the divisions and sub-divisions for the class number and the subjects they denote. Simple correspondence is filed just as it comes in. Informal correspondence complaints are placed in heavy manila binders, ruled on the outside to show the file and complaint numbers, name of complainant, nature of complaint and closing date.

Formal complaints, those which cannot be adjusted by correspondence and upon which it is necessary to hold hearings, are treated in the same manner as applications from companies for permission to exercise franchises, issue securities, etc. The documents and correspondence in such formal cases are placed flat in large linen envelopes. The various kinds of papers for each case, such as correspondence, briefs, orders and permissions of service and testimony, are fastened separately in binders of distinctive color before being placed in the large case envelope. This obviates the necessity of going through the entire envelope in order to locate any particular kind of document. Formal and informal cases are transferred from the files as they are closed, but simple correspondence is transferred annually.

2. *Methods of Indexing:*

The method of indexing simple correspondence consists simply of writing a card (3 in. x 5 in.) under the name of the correspondent with a file number at the left. Cross-reference cards are made for the names of additional correspondents. A letter on a new subject would mean the addition of a new class number on the correspondent's card. In case the letter refers to a particular company, the main entry would be made in the name of the company and a cross-reference card under the name of the writer. Cross-reference cards are also used for any company officials who sign letters. If the name of a place is mentioned, a blue cross-reference card is prepared.

The indexing of informal correspondence complaints is a little more elaborate than that for simple correspondence, but it is along the same lines. The name of the complainant is indexed on a white card, that of the respondent corporation on a salmon card, and that of the place, if any, on a blue card. Each card is marked "CC" (*i.e.*, correspondence complaint) in the upper right-hand corner, and on it is placed a brief statement as to the nature of the complaint. A serial number is assigned to each complaint in the order of receipt. This number corresponds to a record kept in an "accession book," a specimen page of which is reproduced in the illustration on page 200. In this a single line is used for each complaint, and twenty-five can be entered on one page. The chief value of this book is its use for statistical purposes, as it is a very simple matter to count the number of complaints received under each class during a year. It also helps the filing clerk to locate complaints when they are called for by serial number.

Formal matters are indexed on the same colored cards as informal correspondence complaints, green ones in addition being used for applications for new securities, etc. A case number is placed on each index card, this being taken from the docket, in which a whole page is reserved for each case. All papers or letters in relation to formal cases are entered in this book before being filed, as well as the dates of hearings, closing resolutions and orders.

3. *Charging System:*

A simple charge system for letters and other material removed from the files is kept by means of small blank manila slips (about 2 in. x 3 in.). These slips contain the file number, the date of the letter or document, the name of the borrower and the date when taken. They are arranged in a special drawer in exactly the same order as the material in the files. When the papers are returned, the slips are destroyed. Should any member of the staff transfer any letters or documents charged to him, a transfer slip having a notation to that effect is sent to the filing department. From this slip a new charge is made and the old one destroyed.

4. *The Follow-up:*

An important function of the filing department is the following up of all matters until they are brought to a conclusion. The system used is the "Memindex." A notation is usually made on the face of correspondence returned to the files as to the date when the person conducting it wishes to have it again. In the absence of such notation, the clerk who discharges it uses her own judgment as to the date when it should be brought up for attention. Each morning one of the filing clerks takes from the files all papers which need attention that day, and these are sent to the secretary's office for distribution. Follow-up cards are also kept for various members of the staff, these containing lists of the matters which have been delegated to them for special investigation, etc.

5. *Handling of Mail:*

A point worth special attention is the procedure gone through in handling the incoming mail. All such mail goes first to the filing department, where it is classified, indexed and charged. Any previous correspondence is taken from the files and sent out with the incoming letters. Thus a record is obtained for each piece of mail before it comes to the attention of the addressee, and he automatically receives any related correspondence.

COST OF REGULATION

What it has cost the taxpayers in New York State to build up the regulatory machinery that has been described may be partly judged from the following table showing the expenses of the commission for the periods designated:

First fifteen months, July 1, 1907, to Sept. 30, 1908	$307,734
Fiscal year from Oct. 1, 1908, to Sept. 30, 1909	276,575
Fiscal year from Oct. 1, 1909, to Sept. 30, 1910	295,443
Fiscal year from Oct. 1, 1910, to Sept. 30, 1911	342,739
Fiscal year from Oct. 1, 1911, to Sept. 30, 1912	372,323
Fiscal year from Oct. 1, 1912, to Sept. 30, 1913	373,068
Fiscal year from Oct. 1, 1913, to Sept. 30, 1914	405,955
Fiscal year from Oct. 1, 1914, to Sept. 30, 1915	438,056
	$2,818,893

The appropriations for the last fiscal year, from Oct. 1, 1915, to Sept. 1, 1916, amounted to $394,296. The foregoing figures, however, do not include $43,414 expended from a special fund of $100,000 appropriated to investigate telephone rates in New York City. Probably the real cost of the commission for the nine years of its existence will be not far from three and a quarter million dollars.

New Clubhouse for Employees

Chicago Surface Lines Opens New Clubhouse for Its Employees, Made Necessary by the Growth of the Club Formed Two Years Ago

About 600 employees including the various officials and department heads were present at the opening of the new Chicago Surface Lines clubhouse at 1126 North Dearborn Street on Jan. 20. The club quarters are the natural outgrowth of the activities of the Surface Lines Club which had its beginning just two years ago when a small group got together in a bowling club. The idea grew from the good spirit of this small organization and the officers fostered the plan of promoting the feeling of fellowship and common interest among the employees until the club came to include some 700 members from the administrative offices with a women's auxiliary of eighty members.

From the enthusiasm which prevailed at the first annual banquet at the Midday Club, at the dances and other social events, it became evident to the officers that the club should have a home. The property on Dearborn Street offered the possibility. This is a three-story building on the north side, five minutes from the loop, which was originally built as a club house for the old Lincoln Cycling Club.

When the Union Traction Company built its cable-power house just back of this on Clark Street, it was forced to purchase this property on account of the vibration caused by the heavy engines. The place has since been leased to different organizations, with the last lease expiring on Aug. 1, 1916. Shortly afterward the officials decided to make this the social center of the company, and accordingly began making the building ready. The interior was rebuilt and redecorated completely, except two rooms on the main floor which are now used for the library and the chess and checker room, in which the old genuine black walnut woodwork was refinished and retained. The rooms were pleasantly furnished and the club equipped with two bowling alleys, an indoor golf course, swimming tank, gymnasium, etc. The library and lounging room on the first floor were furnished in a particularly attractive manner. There is also an auditorium which will seat 600 people comfortably, and a stage large enough to serve the company's entire orchestra. This room will also be used for dancing.

At the opening gathering, President L. A. Busby, H. A. Blair, J. E. Wilkie and A. J. Klatte, president of the club, gave short addresses, and the company orchestra furnished music. Later the ladies' auxiliary served light lunch and dancing followed.

It is the plan of the club to reserve the bowling alleys and swimming pool for the use of the ladies one evening a week. The present activities of the club will probably be extended later on to include certain educational features, and it may eventually become a section of the American Electric Railway Association.

In keeping with an annual custom the Illinois Traction System, Peoria, Ill., has awarded prizes to the substation attendants at stations where the appearance of stations and station grounds was the best during the past year. For stations with an agency first prize was awarded to Pithian, second prize to Harristown. For stations without an agency first prize was awarded the attendants of the substation at Anderson, second prize to Virden. In the bulletin announcing the prize winners Signal Engineer John Leisenring comments on the improvement in condition of many other stations. The competition for the 1917 prizes promises to be decidedly keen.

Developing a Publicity Plan

Immature Publicity Ideas of Officials Handicap Publicity Men—Latter Must Have Real Chance to Show Way to Publicity—Means of Promoting Loyalty of Employees and Minimizing Public Antagonism

By W. DWIGHT BURROUGHS
Publicity Manager, United Railways & Electric Company, Baltimore, Md.

AN electric railway contemplating the employment of a publicity manager should first determine that it wants publicity. The man approached to undertake such work should assure himself that the organization wants publicity. Wanting a publicity man and wanting publicity are not so closely related as the uninitiated may suppose. The reason for this is that the average railway official is so thoroughly wrapped up in the minutiæ of his business that he has no publicity ideas at all, or those that he has are of such a primitive character that they are worse than useless—they are dangerous.

It is all very well when the employing organization understands this. It too frequently happens, however, that such is not the case, and the publicity man's first task is to disillusionize his employers. Sometimes this is his most difficult and discouraging task. Publicity men who have met such conditions tell me the more primitive the publicity ideas held by company officials, the more insistent these men are that such ideas are the actual goal posts of successful publicity. This attitude, if persisted in, stultifies the most efficient efforts that might be employed by the publicity man for the good of the organization. It blocks the way to the accomplishment of anything that proper publicity would bring, and when such officials finally come to a realization of the stationary position they are occupying, they simultaneously realize that they did not want publicity in the first place.

DO NOT TIE YOUR PUBLICITY MAN DOWN

Hence, if you imagine you want a publicity man, satisfy yourself that you really want publicity. Then get a good man—one who will have confidence in you, as well as one in whom you will have confidence. Give him a chance to learn something about the business, and then let him show the way to publicity.

Do not tell him all you know and require him to follow your ideas without deviation. Do not give him a guide book to publicity and tell him to follow exactly all the rules laid down therein. Do not hand him a copy of the address of some one at the Atlantic City convention and tell him to have no other rule than those laid down in that eloquent paper. Do not show him a magazine article by a publicity man—Burroughs or anybody else—and direct him not to depart from the suggestions made in it.

Your publicity man can absorb a great deal of good from all these various agencies, but he should not be tied down to any rules that have not been predicated upon the conditions he finds in your organization and in your community. Tell him all you know of publicity, give him the guide book if you want to, let him read all the convention addresses and the magazine articles on publicity, and then tell him to select from each of these sources the best ideas to meet the particular situation which he has to meet.

Persons who make a close study of railway operations must be impressed with the care exercised—frequently under the most discouraging and unfavorable conditions—to cater to public comfort, convenience and safety, and to comply with public demands. I believe that the railways desire to give the people what they need; that they are anxious to render the best service possible, and that they accept the legal maxim: "When you devote your property to a use in which the public has an interest, you grant to the public an interest in that use and must submit to being controlled by the public for the common good to the extent that such interest is created." And, generally speaking, I believe that railways dissent from suggestions for their control only when they believe the suggestions do not represent the public will, and when they are not satisfied that the control sought is for the "common good."

It is so very easy to understand that the best interests of such a public service corporation as an electric railway is to do the people's will, that there can be but one answer to the question: why does any part of the public assume, as it undeniably does, that the company is antagonistic to the people, arbitrarily set against them, contrary-minded and obdurate, pompously running roughshod over the community without leave or license, save when it is summarily seized by the neck and shaken to its senses? And that answer is, the people do not know. They have not been taught to think kindly of corporations generally, and they have had many opportunities to be misinformed concerning the railway in particular.

There is not a man in any railway-blessed city in the land who, if he took stock of his store of information, would not find that he knew fifty good things about the electric railway, fifty ways in which it was of indispensable worth to him. Yet, because he knows one thing that he does not like (which fact does not signify that it is wrong), he is prone to forget the fifty benefits he enjoys and rise in indignant protest, denunciation, abuse and insult. No public service corporation will ever be free from unjust attacks. There is no earthly possibility of the extinction of the fanatics, grouches and unreasoning people who constitute an ever-present thorn in the side of everything good. But the vast majority of the people are reasonable, if one can reach them and direct their reasoning into correctly charted channels, and this directing must be done by practice and preaching.

FOSTERING THE SPIRIT OF SERVICE

One of the best forms of preaching for an electric railway is that done by individual employees. For instance, the newspapers may devote columns of space to articles saying that street railway treats its men with fairness, but the man who reads these columns will not be half so much impressed as he will be by the plain spoken answer of an employee in such a conversation as follows: "Where are you working?" "On the Sixth Avenue line." "How do they treat you?" "Fine!" Here is the ideal situation. The company has won the loyalty and confidence of the employee, and he has become a preacher to the people. Railways need thousands of such preachers, and they will be far more eloquent than a whole lot of words in the newspapers.

The problem of every publicity man is to promote and foster a spirit of service in employer and employees, and to help this spirit of service to become generally recognized in the community as synonymous with safe service, courteous service and efficient service? To the extent that a corporation is able to instill in the heart of each individual and into the daily practice of every employee this spirit of care, courtesy, capability and co-operation, to that extent will it progress toward the solution of the problems that it is called upon to face. If a railway is diligent, constant and conscientious in its devotion to service, it is going to infuse some of this self-same spirit into the public mind and action, win its confidence and strengthen its moral support.

One may appear rather optimistic and enthusiastic in thus expecting a development of greater devotion to the organization among its employees and a cultivation of a clearer understanding of the organization by the public, but optimism and enthusiasm, faith and energy are essential to the accomplishment of the things in mind, if one intends to go after them in dead earnest.

Success Requires Time

In this undertaking it is impossible to achieve a considerable measure of success in a day, a week or a month. One can make headway with an individual in a day, an hour or probably an instant. A courteous word, a considerate act, something which is done right and which the layman can see might have been done wrong with the exercise of less care—any or all of these will help to win a friend. But it will not suffice for Citizen Smith to have a good opinion of the gentlemanly qualities of Jones, the conductor; or of the proficiency of Brown, the motorman; or the accuracy of Black, the clerk, or of the executive ability of White, the official. He must come to know that Jones, Brown, Black and White are not exceptions but are types of the men throughout an organization which is doing with all its might everything it can to render the public a safe service, a courteous service and an efficient service.

In an effort to analyze ways and means of encouraging employees and promoting loyalty to a company and of minimizing public antagonism and cultivating public support, I have arranged a classification of ideas which may be considered severally or jointly. Some of these are now in practice in many companies. Others are probably impracticable in some cities. Some that appear at first blush to be impracticable may prove upon consideration to be perfectly feasible.

For Cultivating Public Support

1. News articles for the newspapers concerning the activities of the company:
    a—Construction work (prospective, under way and completed).
    b—New, remodeled and improved equipment.
    c—Routes and re-routing.
    d—Schedule changes.
    e—Special provision for meeting specific conditions.
    f—Such action of the board of directors or officials as may be interesting to the public, etc.
2. News articles for the papers concerning resorts reached by the company:
    a—Current and coming attractions.
    b—Public activities at these resorts, with daily publication of organizations attending, games scheduled, etc.
3. Feature articles for the newspapers concerning interesting phases of the railway business.
4. Transfers; use of the reverse side for safety advice.
5. Folders.
6. Newspaper advertising.
7. Leaflet for distribution in the cars weekly:

This should be prepared with the idea of inspiring it with an educational value through the presentation in concise form of plain, striking facts and figures with which the public is not familiar, but which it should know if it is to be led to a proper conception of the railway's place in the life of the community.

8. Talks on interesting railway topics to community gatherings and civic, social, church and other organizations.
9. Safety first exhibition, or a general railway educational exhibition.

For Encouraging Employees:

1. Sports:
    a—Baseball.
    b—Bowling.
    c—Billiards.
    d—Outings.
    e—Other pastimes.
2. Entertainment:
    a—Reading rooms.
    b—Periodic meetings at which there may be talks on railway matters by heads of departments, etc., and on general current interest topics by outsiders.
    c—Other entertainment.
3. Publicity:
    a—Newspaper reports of results of contests, etc.
    b—Newspaper reports of anniversaries of service, etc.
    c—Personal items to be placed in the newspapers for the men.
    d—A magazine:

This should be published monthly. Its contents should be informative and encouraging; not too technical, but instructive and helpful—including good, plainly written contributions from heads of departments, etc., on various phases and features of the street railway business, the operation of the road, daily transportation problems and how they are solved, methods of management, the system in different departments, etc. With all its seriousness it should avoid heaviness and sombreness, though it should impress its readers with the dignity and importance of the respective posts which they fill and of the duties they are called upon to discharge. In short, it should be worth while to every member of the organization. Its contents should not go over the heads of any of its readers, and it should be thought too much of by them to be tossed under foot. It should have a regular column or page for suggestions and these should be solicited from all employees. There should also be a "question box," the answers being prepared by the heads of those divisions within whose province the questions severally fall.

4. Commendation.
5. Compensation—fair pay for fair work.
6. Rewards, a pension system and a life insurance plan.
7. General welfare work, looking out for the sick, etc.

In a recent decision of the Interstate Commerce Commission the New York Central Lines are ordered to enter into an arrangement with the Illinois Traction System for joint through rates from Fetzer, Ill., to points on the New York Central lines in specified territory. The decision was rendered in answer to a petition from shippers at Fetzer, a small station on the lines of the Illinois Traction System near Springfield.

Several Recent Publicity Posters

Getting Down to Rock Bottom

We must have the good will of the people we serve, to make this a successful public service corporation, from every standpoint.

We must give good service to merit your good will.

President,
International Railway Co.

WE COURT PUBLICITY

The more the people tell us about this Company the better we like it.

We like people to talk about us.

If it is good news, it makes friends for us.

If it is constructive criticism, it helps us correct conditions which should not exist.

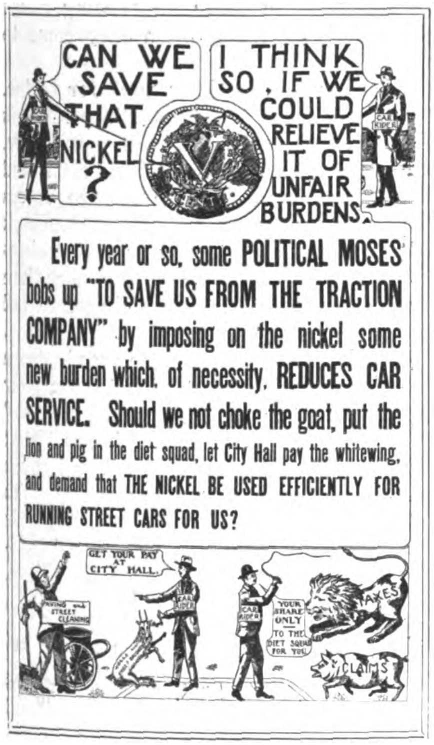
President,
International Railway Company

We Care What You Think

We care a great deal what the people of Buffalo say and think about this Company.

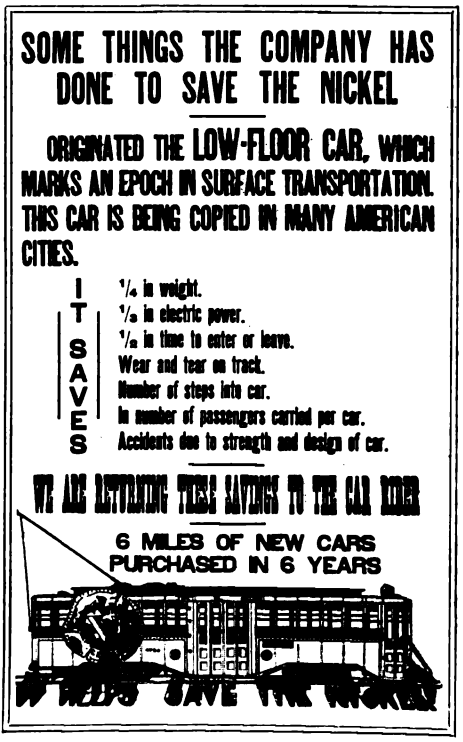
Our earnest effort is constantly to improve our service.

President,
International Railway Co.


CAN WE SAVE THAT NICKEL ?
I THINK SO, IF WE COULD RELIEVE IT OF UNFAIR BURDENS.
CAR RIDER
CENTS
GET YOUR PAY AT CITY HALL.
PAVING and STREET CLEANING
CAR RIDER
YOUR SHARE ONLY TO THE DIET SQUAD FOR YOU
TAXES
CLAIMS

Every year or so, some POLITICAL MOSES bobs up "TO SAVE US FROM THE TRACTION COMPANY" by imposing on the nickel some new burden which, of necessity, REDUCES CAR SERVICE. Should we not choke the goat, put the lion and pig in the diet squad, let City Hall pay the whitewing, and demand that THE NICKEL BE USED EFFICIENTLY FOR RUNNING STREET CARS FOR US?

The three posters at the top of this page were issued by the International Railway, Buffalo, within the past two weeks as part of its present campaign to improve public relations. The two posters in the middle of this page have just been published by the Pittsburgh Railways. They form parts of the series begun by the company on "How long will the nickel stand the strain?" mentioned on page 1338 of the issue of this paper for Dec. 30, 1916. The reproduction at the bottom of the page shows four of eight safety-first sketches, published in a recent Sunday comic supplement of the *Kansas City Post* and forming part of the safety campaign of the Kansas City Railways. As a direct way of reaching the children this method of advertising seems effective.

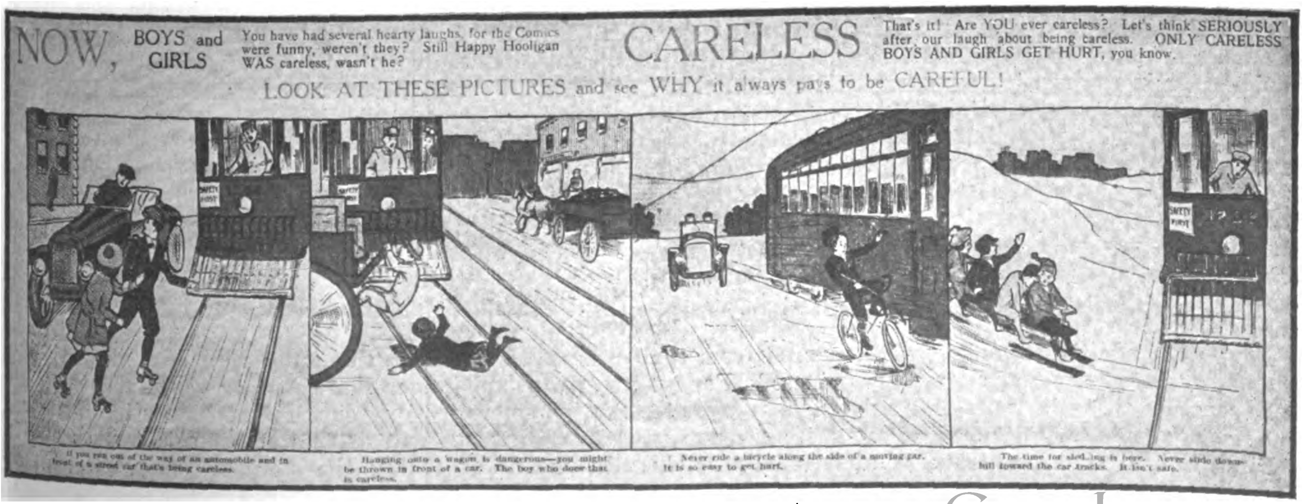

SOME THINGS THE COMPANY HAS DONE TO SAVE THE NICKEL

ORIGINATED THE LOW-FLOOR CAR, WHICH MARKS AN EPOCH IN SURFACE TRANSPORTATION. THIS CAR IS BEING COPIED IN MANY AMERICAN CITIES.

IT SAVES
- ¼ in weight.
- ⅓ in electric power.
- ½ in time to enter or leave.
- Wear and tear on track.
- Number of steps into car.
- In number of passengers carried per car.
- Accidents due to strength and design of car.

WE ARE RETURNING THESE SAVINGS TO THE CAR RIDER

6 MILES OF NEW CARS PURCHASED IN 6 YEARS


NOW, BOYS and GIRLS You have had several hearty laughs, for the Comics were funny, weren't they? Still Happy Hooligan WAS careless, wasn't he? CARELESS That's it! Are YOU ever careless? Let's think SERIOUSLY after our laugh about being careless. ONLY CARELESS BOYS AND GIRLS GET HURT, you know.

LOOK AT THESE PICTURES and see WHY it always pays to be CAREFUL!

If you run out of the way of an automobile and in front of a street car that's being careless.

Hanging onto a wagon is dangerous—you might be thrown in front of a car. The boy who does that is careless.

Never ride a bicycle along the side of a moving car. It is so easy to get hurt.

The time for sledding is here. Never slide downhill toward the car tracks. It isn't safe.

Development of Traffic

Symposium of Articles Describing the Methods Followed by Four Prominent Interurban Railway Companies—The Haulage of Freight Is Considered a Most Desirable Form of Revenue

THE ELECTRIC RAILWAY JOURNAL has obtained contributions on the subject of freight traffic from the offices in charge of this class of business on four important interurban railways. Many electric railway companies carry on a freight traffic on a small scale. A few of them do a considerable business in this line. The greater number have as yet done nothing. The writers in this issue point out that freight haulage offers an opportunity for much greater gross revenue with comparatively little investment. Their articles should be helpful at this time when automobiles are affecting to a considerable extent the passenger traffic on many interurban lines.

Advantages of Interline Business

Through Routing of Passengers and Baggage Desirable—Freight Offers a Good Field for Increased Revenue

BY F. D. NORVIEL
General Passenger and Freight Agent, Union Traction Company of Indiana

The development of traffic can be separated into two divisions, passenger traffic and freight traffic, and the latter into three subdivisions: package freight (l.c.l.), carload commodities and an expedited freight traffic peculiar to the Central West—freight carried on passenger cars and sometimes called "traction express." A volume could be written on any one of the above subjects, so that each must of necessity be treated in a brief manner.

First, let us have a square look at our passenger traffic as a source of revenue, and analyze if possible its future.

The electric railways were built as extended street car lines—urban lines—which gradually grew to be the interurban lines as we know them to-day. At first, passenger traffic was the only source of revenue considered and this, only as it might be expected from the immediately local territory. Freight and through travel received no thought in these first estimates, although as early as 1901 the "velvet" which might be secured from handling package freight was being occasionally mentioned, timidly we must admit. But what of to-day?

I think it is safe to say that practically every electric line is taking in a revenue from passenger traffic equal to, or in excess of, its most optimistic estimates, but this business is not all derived from the contiguous territory. Traction lines are fast losing to the automobile the local traffic that was once their life blood, but this business is being replaced by the longer haul and more valued interline traffic. If the revenues on electric lines have met their first estimates, why are they so hard up? Because the operating and maintenance costs were largely underestimated; hence the need for more revenue.

Now, what additional traffic can be secured from the passenger side of the transportation business? For let it be conceded that this represents as yet, on an average line, 75 per cent to 90 per cent of the gross revenue.

First, to hold what local travel you have, and possibly coax some more back to you, maintain clean cars and good schedules, keep the trains on time and tell the people about it. To do this, use the newspapers; put out neat and attractive advertising cards and plenty of time-table folders. But at home, good service will advertise a road better than anything else.

Second, if you have parks on your line, go after this business vigorously in the summer time; put on something special and run Sunday or week-end excursions. It is better to fill all the seats at half-price than to have two-thirds of the seats empty. It gets the people in the habit of riding with you. But be sure to give the people all or a little more than you advertise. Do not attempt to fool them.

Third, affiliate with every possible connection, steam or electric. You may not get much from any one of them, but every little helps—"many a mickle make a muckle." Tell the people in your advertising about this and take good care of them when they come to you.

Fourth, where possible put on long runs for trains. Go right in and compete with the trunk lines for this traffic, and do the best you can on schedules and cars, but do not forget that cars have to be kept clean and that they will not stay clean long in service unless looked after. Ticket your passengers through, check their baggage through and arrange your train collections so as not to bother your passengers any more than absolutely necessary. Above all, do not forget to tell the people what you are doing.

Fifth, make arrangements with some good steam line connections and acts as "collector of traffic" in your territory for them, for operating excursions, tourists' arrangements and like traffic to places of interest that you cannot reach by your own rails. Ticket and check baggage through, broaden your working territory to the whole country and then tell the people. This is the way to keep your revenues up. In the railroad business the injunction applies that "to those that have, more shall be given."

FREIGHT TRAFFIC

When we speak of freight traffic we mean freight just as it is recognized on steam lines, car-load and less-than-car-load. Traction lines, almost without exception, are poorly prepared to handle this traffic. Nevertheless I venture to say without fear of contradiction that there is no electric line which does handle freight but has more traffic offered to it than it can possibly take care of. Thus we know that this is a good field for increased revenues. The necessity to advertise does not now exist, but when needed I would surely do it, and I think the very best possible way to advertise this service is to visit the firm, see the "boss" first, and the shipping clerk next, leaving a shipper's guide which shows the points to which you can handle freight and the delivery time, having such guides carefully prepared and printed for each large shipping center. Then visit the retailer in each outlying city or town and induce him to order goods via your line. Keep hammering on your freight service in all general advertising put out, as this does not cost much and is the means of telling the story to the people. These suggestions apply equally to freight both in carloads and less-than-carload lots.

As to special business, the hauling of milk and other dairy products, country produce, poultry and eggs, fresh meats, fruits and like commodities, is yours if you will only take care of it. The securing of pasteurizing stations in dairy centers and the location of poultry, egg and game depots at various points for shipping to industrial centers are easy matters if you can show the people the advantage to be derived from the use of the traction line. Hauling truck farm produce from loading stations at cross-roads, with the privilege of market selling from the car in some established market location on stated days, thus delivering the goods direct from the producer to the consumer, means much to the people and will be appreciated by them, but the commission men will not love you. The above are all matters of detail only and comprise traffic for which the electric lines have a peculiarly clear field of action.

Last but not least comes freight carried on passenger cars. This traffic has become in the Central States a valuable and real asset, a service that the people would not do without were we to try to discontinue it, for it supplies a real want. There is only one "class rate" recognized in our tariffs covering this service, the rates being based on about 50 per cent to 70 per cent of rates between like points via the old line express company, although the minimums per shipment are the same. This traffic is as yet only in its experimental stage, and there is no telling where it may eventually reach. All that is necessary is to work out all details, give efficient service, tell the people this, and gather in the shekels.

Performance of a Michigan Road

During 1916 This Company Operated as High as Eighty Freight Trains a Day—The Service Was Superior to That of the Steam Railroads

BY JAMES H. POUND
General Freight and Passenger Agent, Benton Harbor-St. Joe Railway & Light Company, Benton Harbor, Mich.

The Benton Harbor-St. Joe Railway & Light Company is situated differently, perhaps, than any other electric railway in the country in regard to the handling of freight. It is divided into two divisions, one 14 miles long, known as the Watervliet division, the other 25 miles long and known as the Dowagiac division, Benton Harbor being the terminus of both lines. The Dowagiac division passes through Eau Claire, population 500, on the Big Four Railway and terminates at Dowagiac, population 6000, on the Michigan Central. The Watervliet division passes through Millburg, a small unincorporated hamlet, Coloma, population 800, and Watervliet, population 1000, on the Pere Marquette. So it will be noted that we have no outlet for carload shipments except to the farmer direct. This business is encouraged by having a siding at every cross-road, usually about a mile apart. We have switching arrangements with the Pere Marquette Railway at Coloma, so that we may handle steam-road cars on our Watervliet division.

In 1916 we handled about 400 refrigerator cars of fruit which were shipped to all parts of the country. Ordinarily about 150 cars of manure are handled each season and approximately 750 cars of miscellaneous freight, such as coal, lumber, cement, etc., making a total of about 1300 cars which are distributed or loaded exclusively by the farmer. The use of manure for fertilization purposes is quite essential in this country, and this office has made arrangements with one of the largest distributing companies to handle its business, and most of this produce is ordered through our office and delivered to the farmer at no extra expense to him. In other words, we do all the work.

We operate at least two freight trains every day, and during 1916 operated as high as eighty trains in a day, each train composed of a motor with from one to six trailers. We have direct connection with the Chicago boats at Benton Harbor so that the farmer may leave his shipment on our docks as late as 6 p. m. and it is on the Chicago market at 4 o'clock the next morning. We pick up freight from the docks early in the morning and have it delivered to our farthest terminal by 8 a. m. This proves to be excellent service for the farmer. We also have through connection to practically all points in Indiana (traction all the way) nine months in the year, giving sixteen-hour delivery to Indianapolis and twenty-four-hour delivery to Ft. Wayne, Logansport, Lafayette, Shelbyville and Richmond, Ind. During the rest of the season the service requires about twelve hours' additional time.

In freight equipment we have five freight motors, twenty box and nine rack flats, all equipped up to M.C.B. standards. In addition to our carload business, which during September averaged thirty cars per day, we run practically the same number of cars to the boats loaded with fruit, which is exclusive of our package business.

We have encouraged the different business enterprises to ship our way, so that, for instance, we average five carloads of ice daily during the summer months. In winter, our flats are all busy carrying logs. Our rates to all points when there is steam road competition are based upon the steam-road rates and in some instances are higher. But superior service makes up the difference and gives us more than our percentage of the business.

In the handling of milk, express and mail, we have arranged so that all three of these commodities are carried on the same train. They are carried on passenger runs and are handled without additional expense to this company. The trains carry an express trailer, and the express matter is all handled by the express company. We charge 1½ cents per gallon for transporting milk, and return the empty cans free. These full cans are handled by our passenger crew in charge of the train.

We handle United States mail only as an accommodation to the public and the pay received does not more than cover the expense of handling.

A Heavy Freight Carrying Railway*

More Than Half of the Earnings Come from Freight—Through Rates and Percentages Have Been Established with Many Steam Railroads

BY A. C. WEGNER
Traffic Manager the Toledo & Western Railroad Company, Toledo, Ohio

Any electric railway that is in position to establish freight service on its lines opens up a source of revenue to that company which, with proper development, will add materially to the road's earnings. On our line, where freight service has been given considerable attention, freight revenues amount to better than 50 per cent of the total earnings.

We have been successful in establishing through rates and percentages with many steam railroads. This has enabled us to locate on our line grain elevators, flour mills, hay sheds, cooperage factories, canning factories, brick and tile plants, lumber and coal yards, one milk condensory, a paper mill and one of the largest beet sugar refining plants in this section of the country. The establishment of these through rates has enabled the dealers in these products located on our line to dispose of their goods at almost any market on a through rate, giving them the same advantages that dealers in these same commodities in adjacent towns located on steam railroads enjoy.

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*The physical characteristics of the Toledo & Western Railroad as adapted to freight handling were described in Electric Railway Journal, page 1055, Nov. 18, 1916.

By the establishing of rates on lumber and forest products from North Pacific Coast points, Southern points, and Michigan and Wisconsin points, lumber yards have been established at various places and enjoy the same advantage as if located on a steam railroad. The same applies to coal, through rates being established on bituminous coal from Ohio and West Virginia fields, as well as on anthracite from Pennsylvania fields.

At one point on our line we have direct track connections with a sugar refining plant. During the season just finished, we handled approximately 1000 carloads (in standard freight equipment) of sugar beets to this plant. Most of these beets originated on our own line, but several hundred carloads came from various steam railroads, which published through rates on this commodity in connection with our line. We also handled close to 100 carloads from points on our line to Toledo for delivery to the sugar plant located at that point, making a total of about 1100 carloads of sugar beets this season. On account of the extremely dry summer it was an off year on beets in tonnage. During the season of 1915, with more favorable crop conditions, we handled for both points 1995 carloads of beets. We will have handled before the season is over from the plant located on our line about 300 carloads of beet sugar and beet refuse or pulp, moving off our line to various points in connection with those steam lines with which we have through rates.

Another big source of freight revenue is the handling of crushed stone for stone road building purposes. During 1916 we handled between 2000 and 2500 carloads of this class of freight, which, bringing on an average of $16 per car, shows a very handsome addition to our earnings.

We have established stock pens at all points, enabling live stock dealers to drive their stock in and load from there directly into the car. Some of this stock moves to Toledo over our rails and some to Buffalo, Chicago, Cleveland and other markets in connection with the steam roads with which we have through rates published to destination.

Our line passes through a rich farming country and carries a large amount of milk and cream. Located at Morenci, Mich., is a large milk condensory, owned by a company which also has a plant at Toledo, our eastern terminus. Starting in a small way, its milk business over our line has increased wonderfully in the past few years. Formerly the milk was handled in our regularly scheduled package freight cars, along with other traffic. After some time the total number of cans increased to such an extent that it was necessary for us to establish a milk run, which handles nothing but fresh milk from Morenci and intermediate points to Toledo. By advertising the establishing of this milk run among farmers and the different dairies it was not long before this train carried its full capacity load. On many days it amounts to more than this special can handle, and the remainder is brought in by the next scheduled freight car.

Later on the dairy company began to bottle the milk at the Morenci plant, cool it there, and now ships it out in standard refrigerator cars over our line to our Toledo terminal, from which it is switched to the private side track of the dairy company. Arriving there about midnight, it is checked out to the wagons of the company. This plan results in the milk being delivered at the door of the consumer during the early morning hours. At the present time this business has been increased to two carloads per day, and by next spring it is expected that this will be increased to three carloads per day. Milk being a high-rate commodity, this particular traffic is most desirable.

As our line is known as a heavy freight carrying electric railway, I feel warranted in saying that the electric lines must look to the development of freight traffic on their lines in order to show any substantial increase in revenue, and so far we are well pleased with the showing our line has made in that phase of railway traffic.

A Far Western Experience

Seven Definite Recommendations Given for Development of Freight Business—Experience and Ability Form the Combination That Will Succeed

BY W. H. SOMERS
Traffic Manager Puget Sound Railway, Pacific Northwest Traction Company, Puget Sound Traction, Light & Power Company, Seattle, Wash.

The development of freight traffic is an important phase of the freight business. Good service and adequate facilities are requisites and should be provided to the extent that the present and prospective business justifies. Insofar as special facilities are concerned it is doubtful if small lines can afford to speculate on the future in making permanent investments in auxiliaries such as grain elevators, lumber sheds, warehouses, etc., for the encouragement of freight tonnage, unless under exceptionally favorable circumstances which are likely to be very rare.

To be successful, special facilities of this character should be advantageous to the shippers. In fact they should be more or less of a necessity. They should therefore be paid for and maintained by the shippers or handled as a commercial proposition and not as a railway facility. It should, however, be the duty of the transportation company to seek opportunities to encourage the location of warehouses along its lines. Nominal or low rental charges for locations on the railway company's property and a proper basis of rates that will equalize competitive conditions are among the attractions that may be offered.

If the shipper has his money invested in these facilities it virtually makes him a partner in the business, and the railway company is assured of his patronage. Otherwise, the transportation line has no command of the situation.

Insofar as new methods of developing freight traffic are concerned, it may be stated that the evolution of the business has been gradual and not prolific in new discoveries or new methods. The usual means are generally known to experienced freight officials, but they are of varying adaptability and each field seems to present its own intricacies. Success on electric lines is more likely of attainment through the intensive development of the usual methods as applicable to the local situation, than in dependence on new methods.

It is doubtful if any set of practices can be laid down for general guidance, as the conditions vary. There are, however, certain methods that should ordinarily suggest themselves and among them may be mentioned the following:

1. Provide adequate and reliable service.
2. Learn the needs of shippers and endeavor to supply them.

3. Familiarize the shippers with your advantages.
4. Arrange joint rates with steam roads and electric lines where opportunity offers, thereby extending the range of operations.
5. Endeavor to have the points of supply or consumption of products or material changed so that participation in the transportation may be possible.
6. Extend spur tracks into industries where the present or prospective business amply justifies the expense.
7. Encourage the location of new industries along the line, and the enlargement of old ones.

Satisfactory results have been produced through the application of the methods mentioned, but there is one outstanding and essential qualification which virtually embodies them all, and that is practical experience. Methods and formulas may be readily obtained or devised, but successful results are dependent upon the amount of experience and practical knowledge that enters into their execution. What is true of practically every other line of endeavor is equally true of the freight business, and the different results obtained by experience and inexperience may bear but slight resemblance.

The average electric line bears the same relation to the large steam road as the small tract does to the large farm. Intensive methods should govern the former while extensive means are usually applied to the latter in each case. With the electric line, as with the small tract, success is dependent largely upon the accumulative results of diversified efforts, and in both cases the accomplishments will be in about the same measure as the experience and ability.

It is entirely possible for one inexperienced in the freight business to be daily treading upon opportunities without being conscious of their existence—or who upon recognition is unable to appraise them at their proper value. Likewise opportunities may be wasted by inexperienced effort. It is not sufficient to be able to read tariffs and quote rates. One should know the principle on which rates are based and the rate merit of the principal commodities. Otherwise he may not know whether the movement of certain commodities is being retarded or whether the revenue obtained is relatively adequate in upholding the general average.

It is not sufficient to be conversant with one's own rates and service. A traffic official should have general knowledge of the activities of the shippers insofar as they pertain to transportation and to present and prospective markets.

It is not sufficient to assemble an array of methods of other lines and automatically try to put them into practice without full regard to their local application. The local adaptability and the manner of execution may minimize or magnify the results. The variance in the results obtained is due not so much to the knowledge of general methods as to the ability to recognize and develop opportunities.

It is therefore evident that experience is the basis of success in the electric lines' freight business, first in determining the extent to which they should engage in freight operations, and second, in the development work. Experience and ability, in conjunction with the devotion of thought and effort, are the combination that will succeed, and without that combination methods and formulas are of only secondary value.

Small electric lines may feel that their business does not justify the expense of an experienced freight official. However, this should not deter them from the effort to equip themselves properly with talent, and what cannot be done individually may be entirely possible of accomplishment collectively. Therein will lie a measurable achievement in the development and upbuilding of the freight business of a number of the electric lines.

Decreasing Accidents Through a Bonus System

Milwaukee Employees Receive 40 Per Cent of Savings from Injury and Damage Allowance—Participation Based on Demerit System

THE Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has in operation a bonus plan whereby employees in the transportation department receive part of the savings secured by more careful attention to the prevention of injuries and accidents. According to Bruce Cameron, superintendent of transportation United Railways, St. Louis, Mo., who made an investigation of the system in Milwaukee and submitted a report to President Richard McCulloch, the employees in Milwaukee are enthusiastic over the success of the plan during its eighteen months of operation.

Mr. Cameron's report, which was abstracted in a recent issue of the *United Railways Bulletin*, stated that a certain per cent of the gross revenue of the Milwaukee Electric Railway & Light Company is set aside each year to pay injury and damage expenses arising from the operation of the cars. Any saving made from the allowance is partly distributed in the form of a bonus to the employees in the transportation department. If, for example, $500,000 is set aside to meet injury and damage payments and only $400,000 is expended because of increased care and intelligent operation of the cars, 40 per cent of this $100,000 saving (or $40,000) is divided among the employees. A similar percentage goes to the company, and the remaining 20 per cent into a fund for keeping the records. The bonus paid to the men is in addition to the present wage scale and system of compensating the employees according to the length of service.

The motormen and other employees who are entitled to receive a bonus draw 73 per cent of the employees' share, and the conductors entitled to a bonus draw the remaining 27 per cent. The bonuses received by the motormen and conductors climbed steadily during the first year until the motormen were earning $7 extra each month and the conductors about $5 each month. The other employees in the transportation department, such as division superintendents, supervisors, foremen, clerks and miscellaneous car service men, received approximately the same amount of extra money. All employees are figured on the same average of earning capacity, about $1,200 each year, so that the motormen and conductors have an almost equal standing with the superintendents, supervisors and foremen.

In addition to the money allowed to meet injury and damage payments, the report says that another sum is set aside for the maintenance of equipment. If by careful operation there are fewer collisions and less property is destroyed, the difference between the allowance and the cost of repairs and replacements is divided. Moreover, the saving in power through the intelligent operation of the cars figures in the bonus appropriation. A certain sum is also established as the reasonable earnings per car-mile, and if every car hauls its own load, keeps on its own space or secures increased fares, the difference earned above the sum designated is divided among the employees.

The right of employees to share in the bonus distribution is determined from their records. The company has a grade book, and all infractions of rules carry with them a certain number of demerit marks. At the first of the month each employee starts out with 1000 merit marks to his credit. If he is demerited in accordance with the grade book and fails to maintain a grade of 750 points, he loses the right to participate in the bonus for that month, while the careful and efficient profit through his carelessness. Any employee demerited 250 points in three consecutive months is liable to dismissal. The demerits for each accident or violation of rules are determined in the first instance by the division superintendent, the right of appeal being reserved in turn to the bonus committee, the superintendent of transportation and the general manager or president.

The bonus committee at each carhouse consists of the division superintendent as chairman, the director of the Employees' Mutual Benefit Association from that carhouse, and another employee of the transportation department. If the director happens to be a motorman, then a conductor is elected to be the other representative, and vice versa. The motorman or conductor chosen must have a service record of at least three years with the company and be in good standing.

There are no lay-offs or suspensions on account of infractions of the rules of the grade book. The division superintendent posts the demerits in the assembly room of the carhouse. The superintendents, supervisors, foremen, clerks, etc., are demerited on account of infractions of the rules the same as motormen and conductors. Their infractions pertain particularly to negligence in not looking after the cars, letting a space go by unattended, not furnishing the proper service or not attending to duty in any other way.

The Milwaukee plan, according to Superintendent Cameron, gives all employees of the transportation department direct responsibility and interest in reducing the cost of operation, increased safety and revenues from car operation, provides a system for enforcing discipline, and recognizes and rewards the services of efficient men whose treatment of the public earns good will for the company.

Extension of Milwaukee Electrification

Chicago, Milwaukee & St. Paul Railway Authorizes Electrification of Two New Engine Divisions Totaling 220 Miles in Length

THE electrification of two additional engine divisions has been authorized by the directors of the Chicago, Milwaukee & St. Paul Railway. These two divisions lie between the city of Seattle and the division terminal of Othello, about 220 miles to the east, crossing the Cascade Mountains and extending for some distance onto the relatively level plain that comprises the eastern part of the state of Washington. Eastward from Othello, across this plain, there will thus be a gap of somewhat more than 200 miles that is not included in the immediate plans for extension of the electrically-operated line. Temporarily, at least, the division point at Avery, Idaho, which lies at the foot of the Bitter Root Mountains, will remain the western terminus of the original 440-mile electric zone that is now being operated. Ultimately, however, the plan is to establish electric operation over the entire western end of the system, giving a stretch of nearly 900 miles of electrified track between Harlowtown, Mont., and the Pacific Coast.

C. A. Goodnow, assistant to the president, Chicago, Milwaukee & St. Paul Railway, is quoted to the effect that the new electrification through the Cascade Mountains is being undertaken because of the phenomenal success of the electric zone already completed, the outstanding feature of this being the ease with which heavy freight trains are being handled on the mountain grades. Five freight trains of about sixty cars each are moved daily each way across the mountains by the electric locomotives, and it is estimated that four hours' time are saved by each train on each 100 miles of road.

Surveys for the new work have already been made, and the line will be placed in service as soon as possible. No orders for equipment have been placed as yet, but the same type of apparatus, including locomotives, substations and overhead, as that now installed on the present electric zone will be adopted. This involves the use of 3000 volts direct current supplied from substations spaced about 30 miles apart. Power is received at 100,000 volts and is converted by motor-generator sets which supply a catenary contact system with twin copper contact wires supported on wooden poles with bracket arms. The locomotives are of 280 tons weight and are equipped with eight motors of 450 hp. each.

Commission Can Increase Fares Without Municipal Consent

New York Court Holds That Utilities Have Right to Reasonable Rates Despite Franchise Restrictions Imposed by Cities

AN important contribution to legal interpretations of the Public Service Commission law of New York State was recently made by the Appellate Division of the Supreme Court, Third Department, when it overruled the Public Service Commission for the Second District of New York and held that the commission could authorize increased fares beyond the stipulated franchise rate without the assent of local authorities. This decision was rendered in the case of the New York & North Shore Traction Company, Roslyn, N. Y., against the above-mentioned commission (162 N. Y. Supp. 405).

In 1907, the company, then bearing the name of the Mineola, Roslyn & Port Washington Traction Company, secured municipal permission for construction, one condition being that the traction company and its successors should not charge more than 10 cents for a continuous trip from Mineola to Port Washington. In 1915 the company applied to the commission for a fare increase, alleging that 10 cents was unjust and unreasonable. The commission, however, held that, although facts were alleged which, if established, would be ample to warrant the granting of the order sought, it could not, without the consent of the local authorities, increase the fare beyond that set in the original consent.

The ruling just rendered on appeal, however, completely nullifies the decision of the commission and remits the petition for a fare increase to it for further action. The court remarks that the Legislature is prohibited by the constitution from authorizing the construction and operation of street railways except upon the condition that the consent of the local authorities be first obtained. It adds, however, that under another constitutional provision that must be considered in this connection, the local authorities are prohibited from attaching conditions to their consent which assume to regulate the rate of fare, because the right to regulate fares to be charged by public service corporations is essentially a legislative function. This power, of course, is now delegated to the Public Service Commission. In other words, the constitutional provision regarding the giving of consent is a restriction upon the Legislature; and the constitutional provision regarding the exercise of the legislative power is a restriction upon the local authorities in the matter of attaching conditions fixing rates of fares. The court recalls that under a previous decision (196 N. Y. 158, 165) the consent of a city is but a step in the grant of a single, indivisible franchise to construct and operate a street railway, for the authority to make use of the streets for railroad purposes primarily resides in the the State and is a part of its sovereign power.

In conclusion, the court states:

"The Public Service Commission, without the assent of the local authorities, is vested with power to increase the rate of fare on the company's line between Mineola and Port Washington beyond the stipulated rate, in case the proofs shall warrant the decision that the present rate of fare is insufficient to yield a reasonable compensation for the service rendered, and is unjust and unreasonable."

COMMUNICATIONS

Changes Needed in Laws Affecting Personal Injury Suits

SAN FRANCISCO-OAKLAND TERMINAL RAILWAYS
OAKLAND, CAL., Jan. 18, 1917.

To the Editors:

Judicial decisions which have established the legal principles under which are decided street railway personal injury cases are the outgrowth of conditions existing when the electric railway was in its earlier stages of development. In other words, the laws under which such cases must be tried do not suit present conditions. The present situation, involving an unfair burden upon the electric railways, could probably be remedied if the facts were made plain and the electric railways of the country would co-operate to secure the necessary changes in state laws.

When the electric street car first appeared and for years thereafter it was regarded as a strange and unusual method of transportation. The source and application of the energy it used was not generally understood. Its capacity for injury and damage appeared to be large as compared with the slower moving vehicles of the day. The electric car seemed to be in a class by itself, and the burden of extraordinary care and responsibility was placed upon those who operated it. Early legal cases which were decided unfavorably to the electric roads strengthened the popular belief that the electric railway was a dangerous means of travel, and the tendency was to increase the burden upon electric railways.

In the last two decades there has been but slight change in the legal status under which are considered damage and personal injury cases involving electric railways, yet in this time the relative position of the street railway to other common methods of travel has been practically reversed. The swiftly moving automobile in both private and jitney service, with its extremely high rate of acceleration, the heavily laden automobile truck and the large sightseeing automobiles which often carry as many passengers as the street car have increased the traffic dangers many fold. Meantime the improvement of the mechanism of the street car has materially increased the safety of its operation.

Judicial decisions, taking account of changed transportation conditions, so far as pedestrians, automobiles and horsedrawn vehicles are concerned, have kept pace with modern developments with the single exception of the electric railway. The street car is still governed by laws which deal with it as an exception in transportation equipment, potentially as dangerous and to be saddled with the same relative degree of responsibility as during the early years of its development.

Judicial decisions have recognized that a street car must of necessity travel along a fixed path, but they usually fail to determine any principle of right-of-way between street car and automobile. Traffic laws show the same deficiency. Only recently was the passage of a traffic ordinance secured in Oakland, Cal., which gave to street cars at intersecting streets a right-of-way over automobiles. The facility with which automobiles can stop is recognized, but street cars are still held rigidly responsible for the failure of motormen to stop in time to avoid collisions, while, on the other hand, the negligence of an automobile driver cannot be imputed to the passenger or guest in the automobile.

There would be a decrease in "ambulance chasing" and unfounded litigation against street railways as a means to a financial end would be discouraged if the much needed revision of the present laws could be secured. The street railway is a fertile field for exploitation in personal injury suits because only large corporations, always able to respond in damage cases, engage in this field. One element in the situation which requires a change most urgently is that trial costs of a personal injury case have to be paid by the winning party with a judgment for costs against the losing party. Thus unscrupulous lawyers need not hesitate in urging suits against the company on a 50-50 basis. Neither lawyer nor client undertakes risk because in case of decision unfavorable to the client means are easily found to evade the payment of costs by the plaintiff, and the railway company has to stand the loss entailed by the purely mercenary scheme of the "ambulance chaser." W. H. SMITH, Attorney.

Were the Paving Repairs Useless?

BROOKLYN RAPID TRANSIT COMPANY
BROOKLYN, N. Y., Jan. 30, 1917.

To the Editors:

Referring to your editorial on "Useless Repairs to Street Paving," in the issue for Jan. 27, I wonder whether you made inquiry of the maintenance engineer as to why the paving work was being done despite the bad-joint conditions. A situation arises quite often on a large property where one is confronted with a choice between two evils. It can be imagined that the city authorities may have ordered the paving repairs on the street to be done in a specified time without consideration of the ability of the railway to find the men and stop other work of more importance in order to make the joint repairs before the paving work. It not infrequently happens that the city will step in, regardless of requirements from a track viewpoint, and do the paving work at the railroad's expense with the later joint repair still to be done at further expense. Then, too, very bad paving conditions are not good to leave over a winter season, and accident hazard often outweighs all others to such an extent that the temporary repair of paving at the poor joints may be warranted. Furthermore, if the tracks in question are to be rebuilt early this spring, the failure to make joint repairs had a justification in the avoidance of the joint repair expense. It hardly seems conceivable that any official charged with track maintenance would permit the work criticised under any other conditions.

R. C. CRAM,
Assistant Engineer Way and Structure Department.

The Illinois Traction Company, Peoria, Ill., known as the McKinley lines, E. E. Soules, manager of the department of publicity, has sent a greeting in the form of a handsomely lithographed card 5¼ in. wide by 3¼ in. high to the editors of the newspapers in the company's territory. The card contained this expression of appreciation: "The good will you have shown us is a valued asset for which we owe you our sincere thanks and our best efforts to serve you during the coming year."

ASSOCIATION NEWS

Simplification of Wheel Flange Designs Considered by Equipment Committee—Engineering-Accounting Topics Discussed at New York Meeting—Personnel of Standards Committee Announced—Report of Chicago Section Meeting

Flange Contours Discussed by Equipment Committee

Wheel flange contours constituted the major subject of discussion at a meeting of the equipment committee of the Engineering Association held in New York, Jan. 30. E. M. T. Ryder of the committee on way matters attended the meeting and asked for consideration of the possibility of adopting a single standard flange to permit standardization of city special work. The question was raised as to the possibility of providing for M.C.B. flanges in city track, and also in regard to the possible use of a single city flange.

It was conceded that the opportunity to bring interchange equipment with M.C.B. flanges into cities would be most desirable, but the sense of the committee was that no way was apparent to eliminate the present mongrel interurban flange that stands between the M.C.B. design and that frequently used for city cars.

Mr. Ryder then asked for the adoption, if possible, of a single standard thickness of 1 1/16 in. for all flanges, whether for interurban or city wheels, but with varying heights to suit special conditions, and it was decided to canvass a selected list of member companies to determine sentiment in this regard. The query is to be whether a single standard flange thickness is feasible with the three heights, respectively, ⅝ in., ¾ in. and ⅞ in., the ⅝-in. flange being introduced because of its not inconsiderable use at present.

The balance of the meeting was occupied with reports from sub-committees on revision of the various standards of the association. Among these the most radical proposal was that of eliminating that section of the Engineering Manual included under the head of "Miscellaneous Methods and Practices." The consensus of opinion was that the material had but little value, especially because much of it had not been brought up to date. The matter was referred to the executive committee.

The meeting was attended by H. A. Johnson, E. W. Holst, W. E. Johnson, J. J. Sinclair, J. R. Ayers, R. H. Dalgleish and W. G. Gove, chairman, together with representatives of a number of manufacturers who were serving on sub-committees.

Engineering-Accounting

The first meeting of the engineering-accounting committee for 1917 was held at association headquarters on Jan. 22 and 23. Harold Bates, New Haven, Conn., chairman of the committee, presided, and the following other members were in attendance on the first day: J. C. Collins, Rochester, N. Y.; H. A. Gidney, Boston, Mass.; C. H. Lahr, Akron, Ohio; E. P. Roundey, Syracuse, N. Y., and F. H. Sillick, New York City. On the second day J. M. Joel, Utica, N. Y., and W. O. Ingle, Rochester, N. Y., attended the meeting.

The first of the two subjects assigned to the committee is that of interdepartmental charges. The various phases of this subject were thoroughly discussed by the committee, a review also being made of past discussions and recommendations by former committees. It seemed to be generally agreed that the inclusion of interdepartmental with overhead charges in street railway construction and operation is correct in principle and necessary to determine the true cost, and also that some system of cost accounting supplemental to the regular prescribed accounts is desirable. In consequence a sub-committee, consisting of F. H. Sillick, chairman, H. A. Gidney and J. P. Ripley, was appointed with instructions to devise a method of determining an apportionment of shop and power expenses for construction and operation in interdepartmental charges, defining the elements to be considered as so-called overhead charges.

Consideration of the foregoing subject took up most of the first day with the exception of a short discussion of the second topic assigned the committee—the further development of a system for maintaining a continuous inventory of physical property. A second sub-committee to handle this work was appointed, consisting of C. H. Lahr, chairman, L. P. Crecelius and J. C. Collins.

On the second day the discussion of continuous inventories and the system drawn up by the 1916 committee was continued, and certain suggestions were made to the sub-committee, including: (1) A revision of the index system. (2) A consolidation of the primary forms for reporting property changes to the inventory department into one suitable for all cases. (3) The design of sub-forms for the reporting of information by men in the field. (4) A testing out or application of the system outlined by the 1916 committee to disclose any other ways to make improvements.

Engineering Standards Committee

As stated in last week's issue the Engineering Association committee on standards will not consist as heretofore of the chairmen of the technical committees, the purpose of the change being to bring in a group not directly responsible for the committees' recommendations. The 1916-1917 committee consists of the following:

H. H. Adams, Chicago, Ill., chairman; J. H. Hanna, Washington, D. C., vice-chairman; G. W. Palmer, Jr., Boston, Mass.; John Lindall, Boston, Mass.; Martin Schreiber, Newark, N. J.; L. P. Crecelius, Cleveland, Ohio; J. M. Larned, Pittsburgh, Pa.; E. R. Hill, New York City; H. H. Norris, New York City.

Chicago Section Meeting

At the meeting of company section No. 6, held in Chicago on Jan. 16, 130 members and visitors were present to listen to an address by H. M. Brinkerhoff, chief engineer Chicago Transportation and Subway Commission. Mr. Brinkerhoff spoke on "Chicago's Transportation Problem," and used maps of the city showing the proposed extension of the present elevated lines, the new elevated lines and the proposed subways by way of illustrations. He also explained the plans proposed for financing the work and equipping the system ready for operation. During the evening the trio from the Elevated electrical department furnished excellent music.

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Classification of Trucks to Aid Builders and Users—Improved Switch Mate in B.R.T. Standards—Ballast Spreading with Great Economy of Labor—How to Assemble Pinions Correctly—Big job Done with Pole Jacks—Light Weight Portable Welding Furnaces

(Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.)

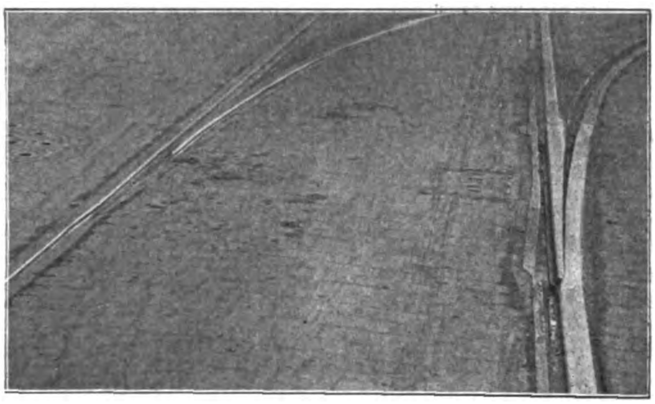
Tongue Switch and Mate Standards

Unusually Large Mate Center Found Economical on B. R. T. System

BY M. BERNARD
Assistant Engineer Way and Structure Department

In this issue of the ELECTRIC RAILWAY JOURNAL for July 22, 1916, page 148, the standard track layout designs of the Brooklyn Rapid Transit System were described. The present article deals with standard tongue switches and mates adopted on the same system.

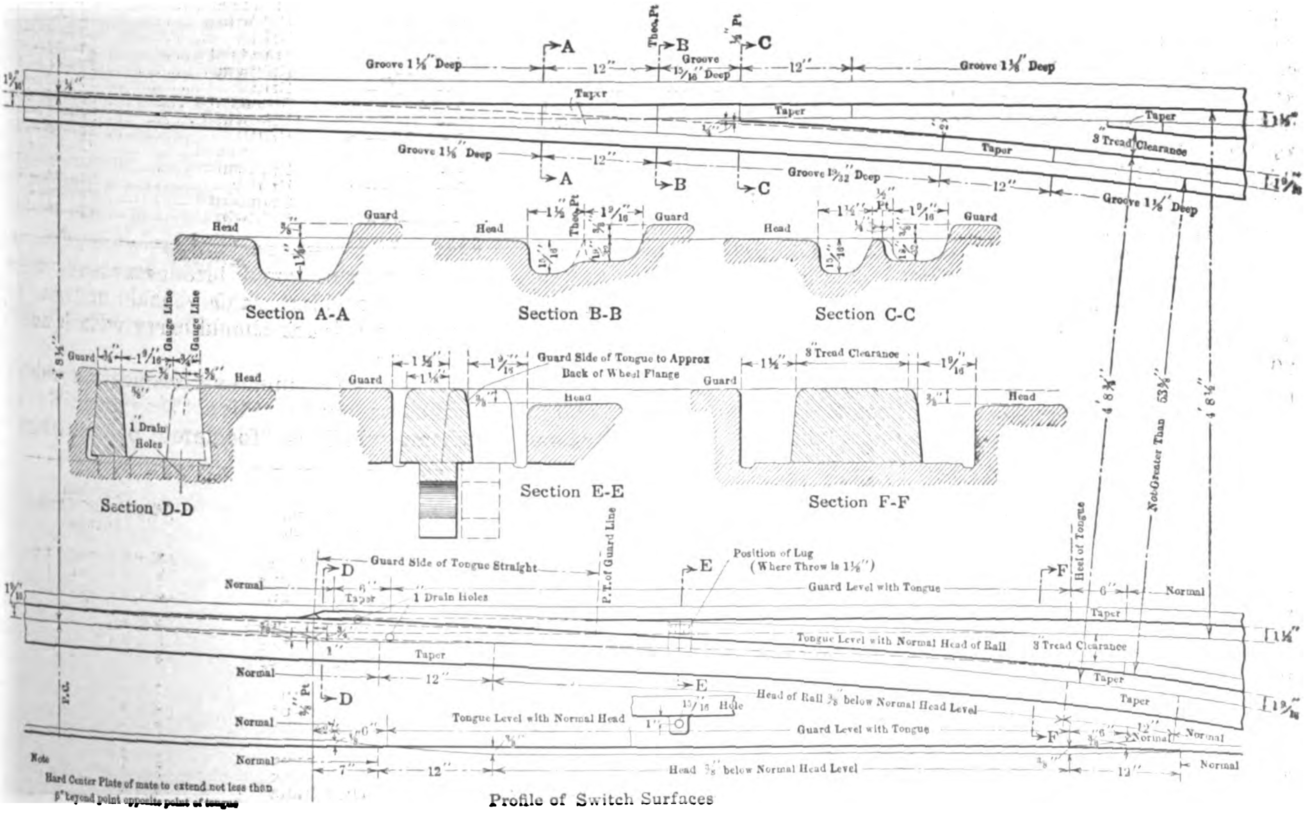
It was considered impracticable to specify any special type of fastening or heel, exception being taken, however, to the use of pin tongues, since the tongue switches furnished by the various manufacturers have certain special features in their design which are covered by patents. The accompanying drawing shows the alignment and face dimensions adopted for the switches and mates together with profiles of switch surfaces.



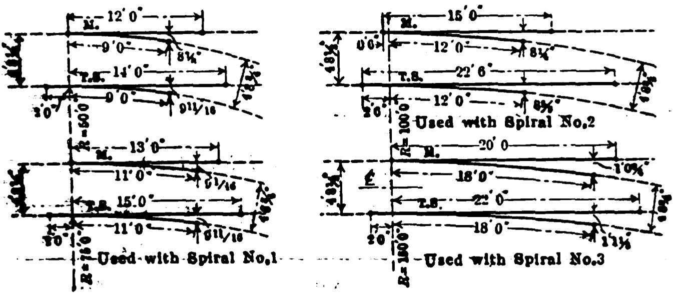
VIEW SHOWING GOUGING OUT AT TOE OF SWITCH MATE

Attention is called, especially, to the comparatively large mate center whereby protection is afforded to the mate opposite the tongue point, mates generally being designed with manganese steel inserts to protect the mate point only. It is believed that by extending the center in the mate to a point approximately opposite the end of the tongue switch center, the pounding and gouging out of the open-hearth steel, frequently found in mates at the point, will be greatly reduced or entirely eliminated. This gouging out at the toe is illustrated in the accompanying photograph. Experience thus far shows that the additional cost for this improvement is well justified.

The lengths adopted as standard for tongue switches


Groove 1 1/8" Deep
A
Theo. Pt.
B
Groove 15/16" Deep
1/2" Pt.
C
12"
Groove 1 1/8" Deep
Taper
Groove 1 1/8" Deep
Groove 1 9/32" Deep
8" Tread Clearance
1 1/8"
1 9/16"
Head
Guard
Section A-A
Section B-B
Section C-C
Gauge Line
1" Drain Holes
Guard Side of Tongue to Approx Back of Wheel Flange
8" Tread Clearance
Section D-D
Section E-E
Section F-F
4' 8 1/2"
4' 8 3/8"
Not Greater Than 53 5/8"
Guard Side of Tongue Straight
P. T. of Guard Line
Position of Lug (Where Throw is 1 1/8")
Heel of Tongue
Normal
6"
1" Drain Holes
Guard Level with Tongue
Tongue Level with Normal Head of Rail
8" Tread Clearance
P. C.
3/8" Pt.
D
E
F
15/16" Hole
Head of Rail 3/8" below Normal Head Level
Tongue Level with Normal Head
Head 3/8" below Normal Head Level
7"
Note
Hard Center Plate of mate to extend not less than 8" beyond point opposite point of tongue
Profile of Switch Surfaces

ALIGNMENT AND FACE DIMENSIONS OF STANDARD TONGUE SWITCHES AND MATES OF THE BROOKLYN RAPID TRANSIT COMPANY of 50-ft., 75-ft., 100-ft. and 150-ft. radii are given in the diagrams below. The curved arms are made in the lengths as shown to permit their use with any one of the standard spirals regardless of the radius of the abutting portion of the curve of which the switch piece forms a part. This would not be possible if the lengths were made greater since the radius of the abutting arc varies according to the design adopted for the special work layout. Likewise, it would be impossible, without rebending the end portion, to use switches having greater lengths than these in connection with cross overs, whose design embodies, generally, a uniform radius at the ends with straight frogs in the middle portion.



STANDARD LENGTHS OF SWITCHES AND MATES ON B. R. T. SYSTEM

Truck Classification

The Author Advocates Use of a Uniform System of Symbols for Defining the Various Classes of Electric Railway Car Trucks

BY S. A. BULLOCK

Manager Electric Truck Department, Baldwin Locomotive Works, Philadelphia, Pa.

In this day of efficiency and standardization it seems strange that little effort has been directed toward a truck classification that really defines—a universal classification that has face value and is not entirely empirical.

Steam locomotives are definitely classified by the location and number of wheels. For instance, 2-4-2 indicates an engine with two idler wheels under the front end, four drivers under the boiler and two trailers under the rear end of the locomotive. With electric railway car trucks one finds such classifications as 39-E-1, 0-36, and 54-18-M. Does anyone aside from the manufacturers know how to compare them? Why not make the name define the object?

This is by no means the case at present. For example, 39-E-1 represents a Brill maximum traction truck with one outside-hung motor per truck. The wheelbase is 54 in. and the maximum center plate load 20,000 lb., the journals being 3¾ in. x 7 in. for drivers and 3 in. x 6 in. on trailers. 0-36 represents the Standard Motor Truck Company's maximum-traction truck, with wheelbase 54 in., center-plate load 18,000 lb., journals 3¾ x 7½ in. for drivers and 3 in. x 7¼ in. on trailers. 54-18-M represents a Baldwin maximum-traction truck, with wheelbase 54 in., center-plate load 18,000 lb., journals 3¾ in. x 7 in. for drivers and 3 in. x 6 in. on trailers.

Baldwin's present method of defining a truck class is that the first figures indicate the wheelbase in inches, the second figures represent the maximum center plate load in thousands of pounds and the final letter indicates the style of truck. Thus, 54-18-M indicates a motor truck, whose wheelbase is 54 in. whose center plate load is 18,000 lb. and whose type is maximum traction, ("maximum traction" is a misnomer, as here applied, and should be "maximum clearance").

The large table below gives an approximate relative comparison of the electric motor-truck classes of Brill, Standard and Baldwin.

In studying truck classifications, these are three essentials: (1) The motors—number per truck—inside or outside hung; (2) The wheelbase; (3) The capacity of the truck. It seems reasonable to formulate from this the following general plan:

The first three classes in the above table could be generally defined by the symbols 1-0-54-36, or preferably 10-54-36. Here the first figure, 1, represents the number of motors per truck. The second figure, 0, is the letter O, meaning outside hung, and represents the location of the motors in the trucks. The figure 54 means inches of wheelbase, and 36 means thousands of pounds load on two trucks. Thus, 1—(motor), O—(outside hung), 54—(inches wheelbase), 36—(thousand pounds maximum carrying capacity of the two trucks), is truck class 10-54-36. For inside hung motor trucks, there could be used, after the number of motors, the figure 1 (or I, meaning inside hung). In order not to confuse the numbers, they should be read thus, Baldwin 21 dash 84 dash 60.

The practical application of this plan would result in the following list of symbols:

Brill	39—E—1	Brill	10—54—40
Standard	O—36	Standard	10—54—36
Baldwin	54—18—M	Baldwin	10—54—36
Brill	76—E—1	Brill	20—58—40
Standard	O—50	Standard	20—54—50
Baldwin	54—18—L	Baldwin	20—54—36
Brill	27—MCB—1	Brill	21—72—46
Standard	C—50	Standard	21—76—50
Baldwin	73—22—K	Baldwin	21—73—44
Brill	27—MCB—2x	Brill	21—72—46
Standard	C—50	Standard	21—76—50
Baldwin	75—25—A	Baldwin	21—75—50
Brill	27—MCB—3x	Brill	21—78—68
Standard	C—60	Standard	21—78—60
Baldwin	84—30—AA	Baldwin	21—84—60

A proper classification would lead eventually to a standardization of axle sizes, which should not have to be specified since every truck should carry with it definite standard axles.

I have endeavored to formulate a classification which is simple, definite and comparative. It is impossible to work out a scheme which is "foolproof" or one which

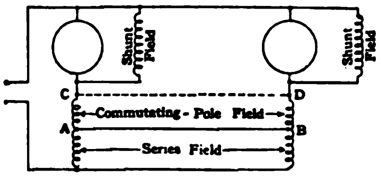
Company	Classification Symbol	Wheel Base, Inches	Center-Plate Load, Pounds	Type City	Location of Motor	Journals Motor and Trailer Inches
Brill	39—E—1	54	20,000	Single Motor	Outside hung	3¾ x 7 and 3 x 6
Standard	O—36	54	18,000	Single Motor	Outside hung	3¾ x 7½ and 3 x 7¼
Baldwin	54—18—M	54	18,000	Single Motor	Outside hung	3¾ x 7 and 3 x 6
				City		
Brill	76—E—1	58	20,000	Double Motor	Outside hung	3¾ x 7
Standard	O—50	54	25,000	Double Motor	Outside hung	3¾ x 7¾
Baldwin	54—18—L	54	18,000	Double Motor	Outside hung	3¾ x 7
				Suburban		
Brill	27—MCB—1	72	23,000	Double Motor	Inside hung	3¾ x 7
Standard	C—50	76	25,000	Double Motor	Inside hung	3¾ x 7
Baldwin	73—22—K	73	22,000	Double Motor	Inside hung	3¾ x 7
				Interurban		
Brill	27—MCB—2	72	23 000	Double Motor	Inside hung	4¼ x 8
Standard	C—50	76	25,000	Double Motor	Inside hung	3¾ x 7
Baldwin	75—25—A	75	25,000	Double Motor	Inside hung	4¼ x 8
				Interurban		
Brill	27—MCB—3	78	31,500	Double Motor	Inside hung	5 x 9
Standard	C—60	78	30,000	Double Motor	Inside hung	4¼ x 8
Baldwin	84—30—AA	84	30,000	Double Motor	Inside hung	5 x 9

will not admit of exceptions. The proposed plan should, however, be useful in the majority of cases.

If the above classification should be designated "Universal" and if present truck classifications were parenthetically interpreted by equivalent universal classifications, it would enable the manufacturer to know exactly what is wanted and would help the customer to know what he is getting and what he already has.

Parallel Operation of D.C. Generators

It frequently becomes necesary in power houses and substations to operate d.c. generators in parallel, and when commutating pole machines are so used the *Electric Journal* points out that the brushes should be placed on the geometrical neutral and should be shifted only as a temporary emergency measure when parallel operation cannot be obtained in any other way. The commutating-pole winding should not be made to act as a series field, and should be used for the sole purpose of insuring good commutation at all loads. The equalizer connection should be between *A* and *B*, as shown in the accompanying diagram, and not between *C* and *D*.



PARALLEL OPERATION OF D.C. GENERATORS SHOWING PROPER LOCATION OF EQUALIZER CONNECTION

Pittsburgh Harrow for Distributing Ballast

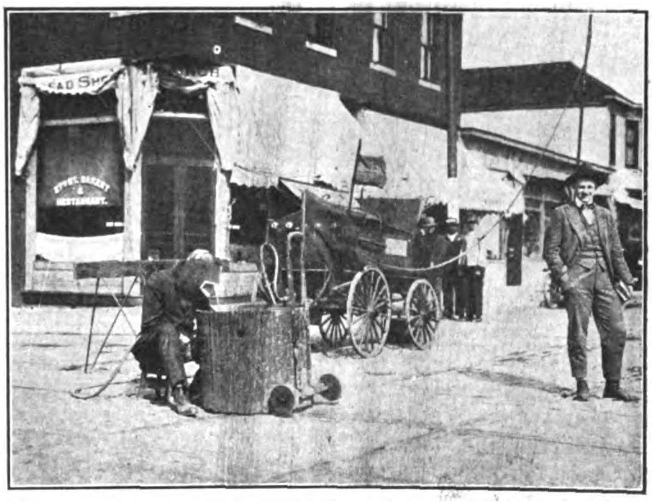
The Pittsburgh Railways, being located in the heart of a great metal working district, has suffered severely from labor shortage. Therefore the way department, in particular, had to set its wits to work to get along with as little human help as possible. One result has been the invention of a harrow for spreading ballast after it is deposited by dump cars. This harrow has been so successful that in one hour with two men it accomplishes as much work as eight men could in one day of hand shoveling.

The harrow, as shown in the illustration, is simply a triangular framework made of 2-in. x 1¼-in. x 12-in. board, with three stiffening ribs of the same material and sufficiently weighted to prevent climbing. To the outer boards are bolted iron teeth, which project 5 in. below the boards. When first used, the harrow was chained to the middle of each truck of the dump car which pulls it. However, experience has shown that it is better to attach it to the cabs, as this enables the harrow to follow curves.

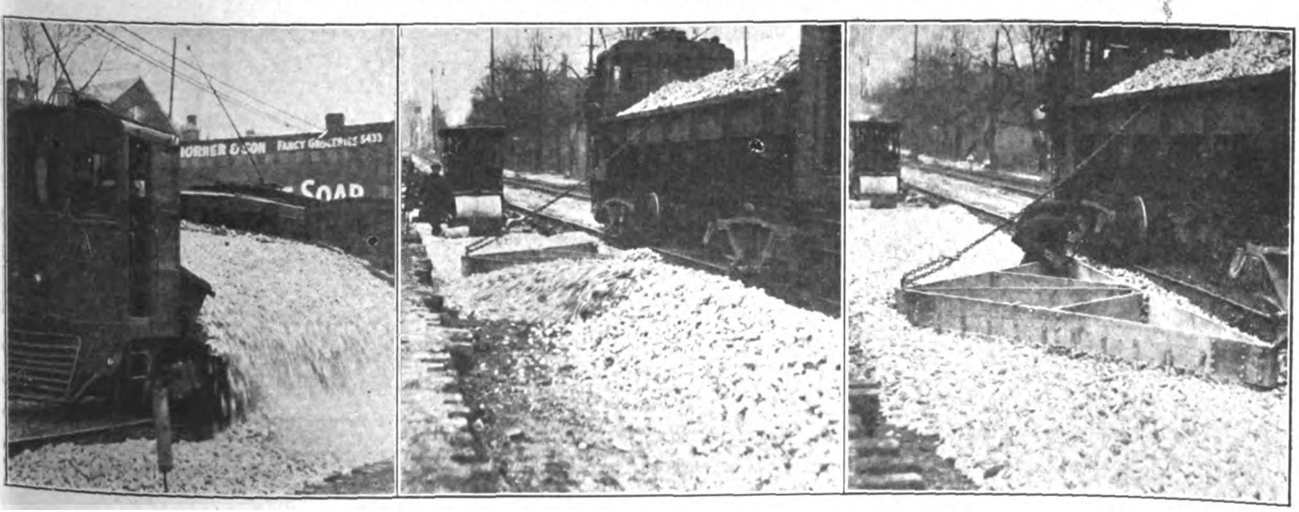
After the dump cars have discharged the ballast, one of these drags the harrow back and forth three or four times over the stretch of 300 ft. to 400 ft. until the ballast is neatly spread; then a steam roller completes the work.

Protecting Public as Well as Operator from Rays of Electric Welder

In Kansas City where the safety-first movement is receiving much attention, the protection of the eyes of the curious public has been taken into consideration in conjunction with the use of the Indianapolis welder in building up worn special work at street intersections. For this purpose a cylindrical guard with an opening on one side through which the operator works is placed on end around the joint being built up. It is mounted on two wheels, so that it can be easily moved from one location to another. Being about 4 ft. high and of the same diameter, it confines the violet rays from the arc so that they are not directly visible to the passers-by. In order to get the direct rays which are injurious to the eye, a person must come so close to the working point that the glare of the arc prevents him from looking injuriously long. The operator is provided with a headgear which protects his eyes and face.

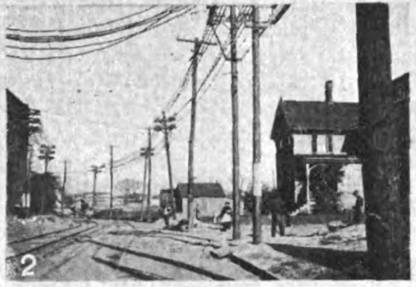


SCREEN FOR SHIELDING EYES OF PASSERS-BY



HARROW SPREADING AS MUCH BALLAST IN FIFTEEN MINUTES AS EIGHT MEN COULD SPREAD WITH SHOVELS IN A DAY

1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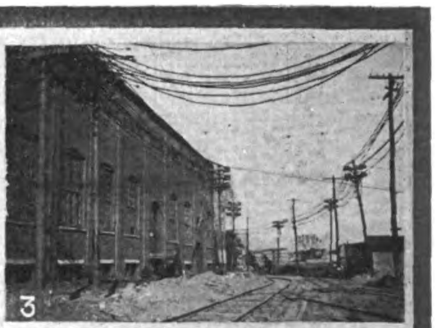
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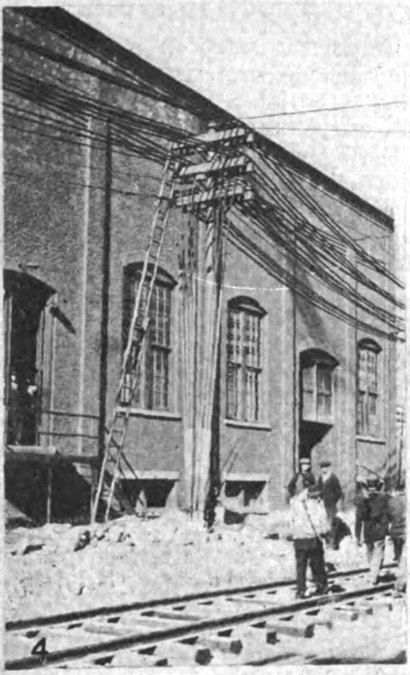
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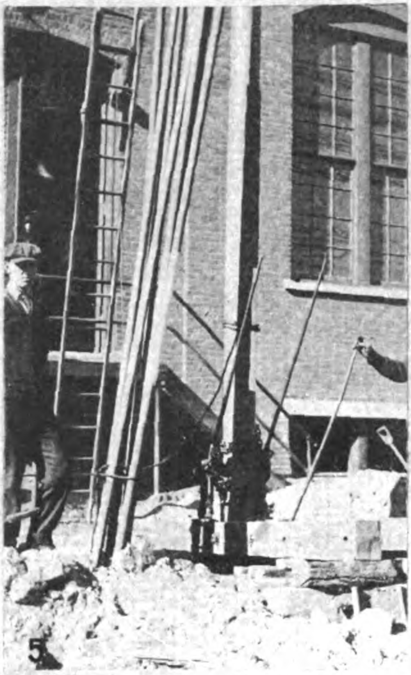
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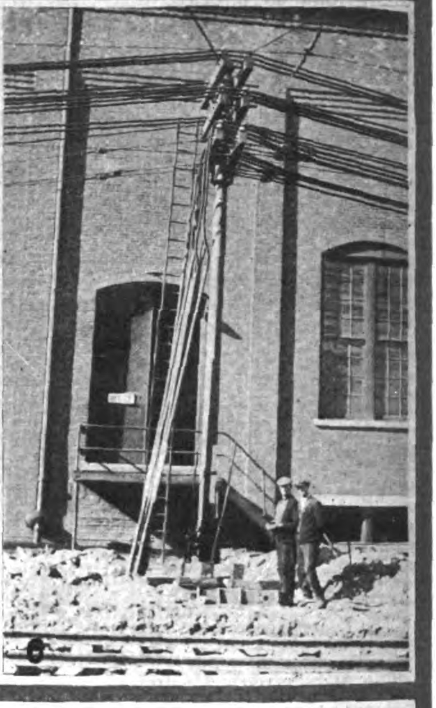
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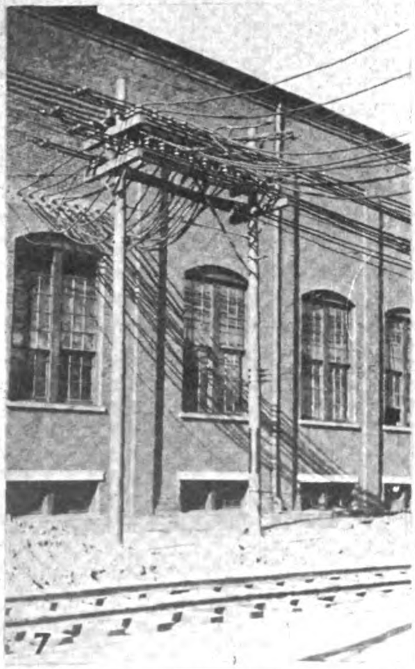
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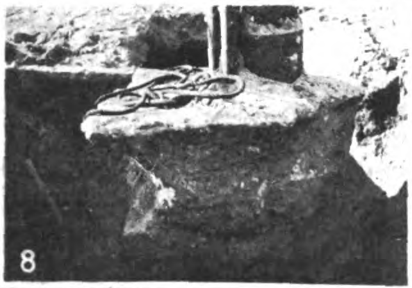
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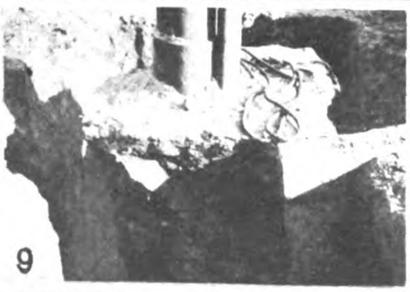
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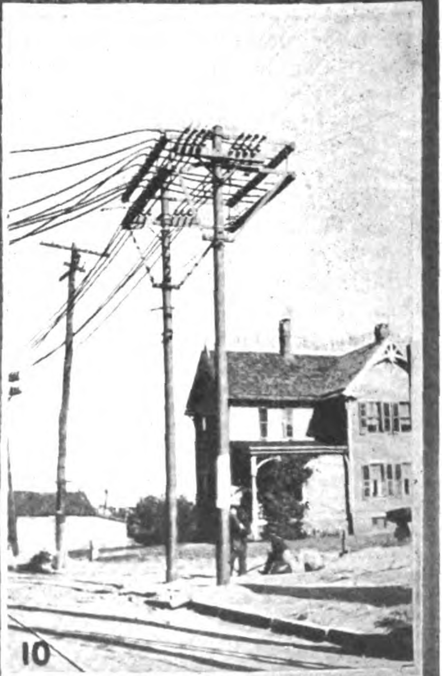
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View 1.—General view of Seaview Avenue, showing pole lines which had to be moved back 2 ft. on account of widening of the street.

View 2.—Pole leaning toward the street is ready to be shifted to the new curb line.

View 3.—Showing heavy loading of the poles near the power house.

Views 4 and 6.—Pole at power house supporting twenty cables.

View 5.—Pole shown in views 4 and 5 being raised with pole jacks.

View 7.—Two poles which were moved as a unit, using six pole jacks.

Views 8 and 9.—Showing how the concrete foundations were moved with the poles.

View 10.—Terminal poles opposite powerhouse which were moved as one unit.

Moving Live and Heavily Loaded Pole Line, Bridgeport, Conn.

Heavily Loaded Feeder Poles Moved with Pole Jacks

Poles Set in Concrete Shifted Without Interrupting Power When Widening of Street Required Pole Line to Be Moved Back Two Feet

BY GEORGE BUTTRICK
General Line Foreman Connecticut Company, Bridgeport, Conn.

The illustrations on the opposite page show work done on Seaview Avenue, Bridgeport, Conn., where on account of the widening of the street it was necessary to move the poles on both sides back a distance of 2 ft. Fifty-two 35-ft. extra-heavy steel poles set in concrete were moved into their new position without disturbing the cables, cutting off the power or destroying the concrete foundations. The views at the top of page 216 show a general layout of the line and how heavily the poles are loaded with cables. On the left-hand side of the street are nineteen 1,000,000-circ. mil cables and one 300,000-circ. mil cable, while the poles on the right-hand side carry twelve 1,000,000-circ. mil cables.

In moving a pole, a hole 6 ft. deep and about 4 ft. square was dug around the base. Blocks and timbers were then placed around the steel pole and two pole jacks, one on each side, were used to raise the pole with its load of cables at the top and its concrete foundation at the bottom. A 2-in. plank was then placed underneath and the pole pushed back the required 2 ft. by means of a third jack. This done, the hole was filled in and tamped in the usual manner.

Views 4, 5 and 6 show a pole at the side of the power station which was loaded with eleven 1,000,000-circ. mil cables and one 300,000-circ. mil cable, all carrying full railway voltage while being moved, and also eight 1,000,000-circ. mil negative cables which dead-end and run down the side of the pole in iron pipes leading into the power station. This entire load was held up with two pole jacks while a third jack was used to push it into the new position. Views 8 and 9 show the mass of concrete at the base of the pole. It was necessary to cut the negative cables in the ground and to splice in 2-ft. lengths of cable after the pole was moved.

The two poles shown in view 7 carry nineteen 1,000,000-circ. mil cables, one 300,000-circ. mil cable and the feeder taps, thus making the heaviest two poles of the entire job. These poles were moved together, concrete foundations and all, using four pole jacks for lifting and two for pushing the poles into their new location. View 10 shows two terminal poles on the opposite side of the street which were moved together in a similar way, using six pole jacks.

The work of moving the fifty-two poles was completed in twenty days with a force of five linemen, three groundmen and one foreman, at a cost of $10.25 per pole, not including the cost of pulling up the feeders and adjusting the slack.

Wood Block Pavement

Reports compiled by the various lumber associations show that the year 1916 marked the completion of a total of 25,000,000 sq. yd. of wooden block pavement in the United States. The use of this pavement has grown immensely in the last few years, especially in view of the discovery that it is more clinging to the automobile wheel than most other forms of pavement. The wooden block is being put in, in preference to other forms of pavement in the Middle West, in spite of the fact that its cost is greater, a slight degree in some places and as much as 50 per cent higher in other localities farther from the forests. The best estimates show that during 1916 approximately 2,500,000 sq. yd. of wood block pavement was laid. New Haven, Conn.; Detroit, Mich.; Minneapolis, Minn.; St. Paul, Minn., and Kansas City, Mo., laid more than 100,000 sq. yd. of it. About 1,000,000 sq. yd. of block were laid in factories during the year, among which was a contract for 30,000 yd. for the General Electric Company, Fort Wayne, Ind., plant.

Press or Shrink Fit Necessary in Putting on Pinions

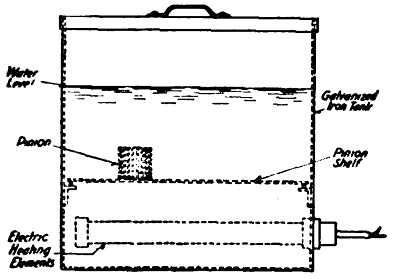
Key Will Not Drive Pinion if Care Is Used and Proper Methods Followed in Doing the Work

BY G. KRONFELD
Railway Department Westinghouse Electric & Manufacturing Company

Simply shoving on a pinion and tightening up the nut is not a satisfactory way of providing against loose pinions. Pinions should drive their gears through the press fit or shrink fit on the shaft and not through the key. The key acts merely as a safety device should the pinion accidentally loosen. The desired fit for the pinion can be had by heating or by pressing.

Before the application of a pinion on a tapered shaft the following precautions should be taken. See that the shaft is clean and free from burrs or swellings, and that the pinion bore is clean and free from burrs. The fit of the pinion bore should be in contact with at least three-quarters of the surface of the taper fit on the shaft. This can be checked by rubbing thin lamp black and oil on the pinion bore and fitting it on the shaft. The pinions should then be put on the shaft cold to make sure that the keyway in the pinion is the proper size for the key mounted on the shaft, and that the pinion does not ride or bind on the top and sides of the key and will not ride the key when pressed further on. The keyway on the pinion can be 0.002 in. larger, but not less than the key.

Pinions can be pressed cold onto the shaft with pressures of from 12 to 25 tons for pinions up to 125 hp., and 40 to 80 tons for pinions transmitting 125 hp. or over. Pinions with bores up to 3 in. that are pressed on cold should advance on the shaft approximately 1/32 in.; those with 3-in. to 4-in. bores, 3/64 in.; and those with 4-in. to 5.5-in. bores, 1/16 in. This distance is measured from the point where the pinion is seated firmly on the shaft before pressing.



ELECTRICALLY HEATED WATER TANK FOR PINIONS

When shrinking on pinions for motors up to 125 hp. they should be heated in boiling water. When the bore is 3 in. or less they should be kept in the water for thirty minutes, and those with 3-in. or larger bore for sixty minutes. They should then be tapped on the shaft with a 6 or 8 lb. sledge hammer using a wooden or copper buffer. This sledging is not to get a driving fit, but to make sure that the pinion is home, and well seated.

To prevent rusting and to insure a clean surface at the fit, washing soda should be added to the water in the proportion of ¼ lb. of soda to 5 gal. of water. A convenient tank for heating pinions in water is shown in the accompanying illustration.

Pinions for motors over 125 hp. should be heated with a gas flame applied in the bore of the pinion in such a manner as not to touch the teeth of the pinion as this might affect the temper. The flame should be so regulated as to take forty-five to seventy-five minutes to bring the pinion to a temperature of 257 to 302 deg. Fahr. The temperature can be measured by placing the bulb of a thermometer against the pinion between the teeth. The surface of the pinion where the bulb touches it must be made perfectly clean by rubbing with emery cloth. It is also important to protect the exposed part of the thermometer by covering it with asbestos cloth so the flame cannot touch the thermometer. When the pinion has reached the correct temperature the pinion is put on the shaft in the same manner as given for pinions for motors up to 125 hp.

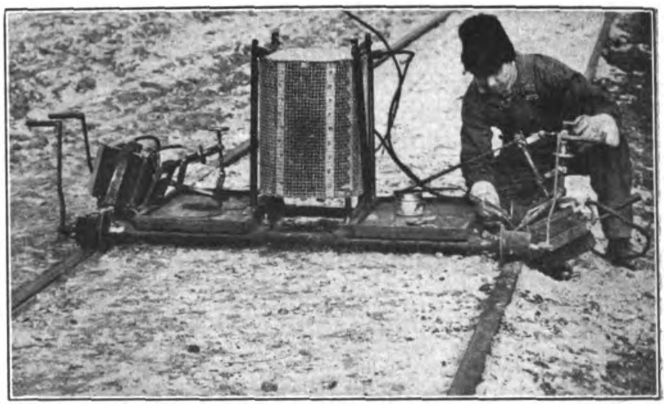
Pinions put on after boiling in water will hold when cool with a pressure of from 12 to 25 tons, and those heated above 257 deg. Fahr., but not above 302 deg. Fahr. with a pressure of from 40 to 80 tons, depending on the length of fit of pinion and diameter of bore.

Portable Welder for Track Bonding

In order to provide a means of installing electrically welded bonds, which would be within the economic possibilities of every railway, however small, the Electric Railway Improvement Company, Cleveland, Ohio, has developed a portable welder to supplement its bonding car. This apparatus is extremely simple, consisting merely of a resistance element weighing about 200 lb., and an electric furnace weighing 65 lb. The function of the outfit is to make possible the utilization of the current from the trolley for welding the bonds onto the rail with the smallest possible apparatus.

By the use of this outfit an electrically welded bond is obtained with a contact having an initial high conductivity and one which it is claimed will not depreciate on account of the elements, and the like. In obtaining this union between the bond and the rail, neither an arc nor a flame strikes the bond or rail, thus the danger of injury to the bond, rail and eyes is avoided. Instead, a heated block of graphite presses against the bond terminal and produces a weld in a way similar to that used with the present Erico bonding cars.

The apparatus is held in position for installing a bond by a yoke which sets over the head of the rail and a chain and hook fastened to the opposite rail. This holds it in a tilted position so that a part of its weight presses against the bond. Two hand wheels on the frame work are provided to adjust the tilt and vertical position of the furnace, so that the surface of the graphite will come into plane contact with the bond terminal.

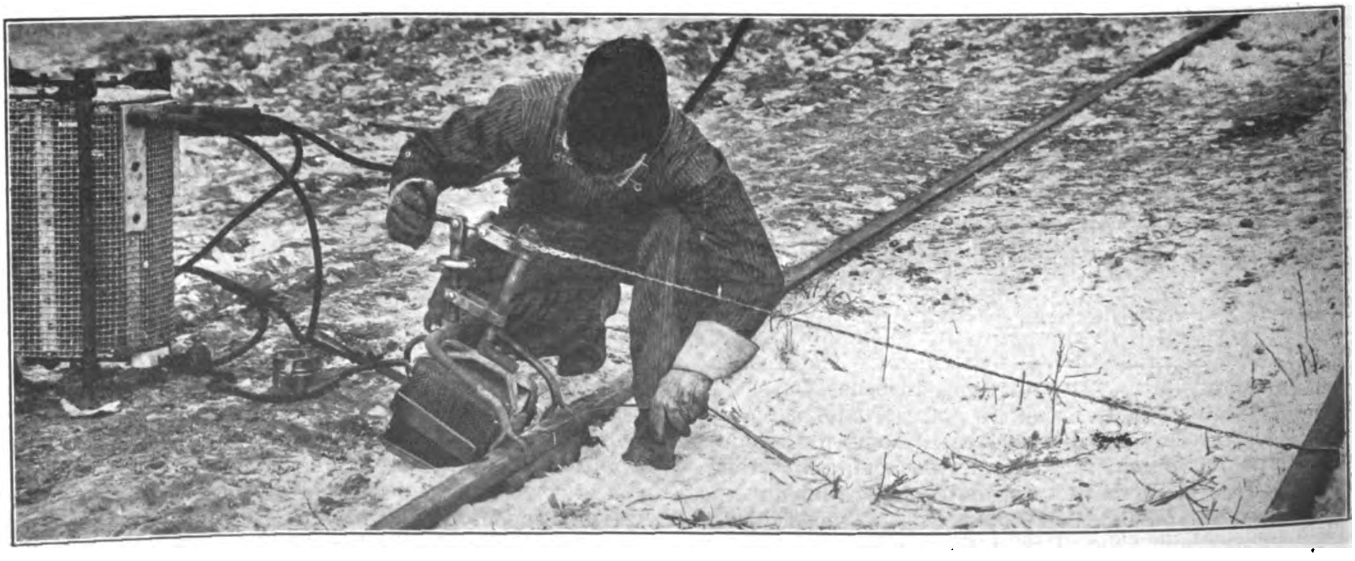


ONE SCHEME OF MOUNTING PORTABLE APPARATUS

The process is as simple as the apparatus. The trolley circuit through the resistance and furnace to the rail is completed by closing the 200-amp. circuit breaker mounted in the center of the rheostat and controlled from the handle at the bottom. The regulation of the welding is obtained by adjusting the position of the electrode and by the use also of five points on the rheostat for this purpose. A current of from 60 to 125 amp. is used in making a weld, and a separate weld is made for each terminal of a bond, just as with the Erico bonding car. The time required per weld is about one minute. By use of the portable welder, it is claimed that a 500,000 or 600,000 circ. mil bond may be installed.

The rheostat contains approximately 4 ohms resistance, and its dimensions are 15 in. x 20 in. x 24 in. The furnace measures 6 in. x 8 in. x 8 in. The two pieces of the apparatus may be handled separately, or mounted on some such car as that shown in one of the accompanying illustrations. The rheostat is equipped with handles which are hinged so that they fall down out of the way when not in use. Handles are also provided on the four-wheeled larry shown and the whole apparatus can be lifted off the track by two men. When mounted on the larry, a furnace may be carried on either side, one for each rail, to save time in moving about.

This portable welder will operate with any voltage, it is claimed, from 150 to 600 volts, the variation being taken care of by means of the several taps off the rheostat. It meets the needs of the small road desiring welded bonds, as it avoids the expense of the heavy investment in the bonding car, and it also finds a special field of usefulness on the larger property on track where traffic is frequent and cannot be suspended.



PORTABLE ELECTRIC WELDER IN USE UNMOUNTED

London Letter

London Enters on Safety Campaign—Courses of Instruction in Safety Work Contemplated

(From Our Regular Correspondent)

A safety first campaign has been inaugurated in London. An important conference was convened by H. E. Blain, operating manager of the London General Omnibus Company, in order to discuss this question in relation to street traffic, and to devise some means of reducing the number of accidents, which since the introduction of restricted lighting have increased steadily. Representatives of forty-four local authorities in the metropolitan area attended, besides numerous other bodies and associations. In opening the proceedings, Mr. Blain stated that he was connected with companies which conveyed 971,000,000 passengers a year. In the first nine months of 1914, fatal street accidents in London amounted to 411, and that number had grown to 577 for the corresponding period of 1916. The street accidents of all descriptions in the latter period amounted to 34,575. By legends on omnibuses and advertisements displayed in railway stations, his company had endeavored to direct the attention of the public to safety first. As a result of the campaign among their own employees and the general public, the number of accidents in which the omnibuses of the company were involved had been reduced by no less than 25 per cent as compared with the previous year. In the letter convening the meeting, it was proposed that there should be:

1. Courses of instruction for traffic and transport employees.
2. The organization of street traffic with a view to greater public safety and efficiency.
3. The preparation of schemes with regard to street refugees, "safety" notices on lamps, etc., and for the education of the public, and to arrange effective publicity: (a) Through the press, (b) by poster advertisement, (c) by pictorial and other educational means for children, (d) by cinematograph films in picture theaters, (e) by a safety first exhibition to which the public would have free admission, etc.
4. The formation of an adequate organization to achieve these objects, and the creation of a fund for the purpose of providing the necessary income.

CO-OPERATION NEEDED

Mr. Blain referred in turn to most of these suggestions, and gave reasons why each of them would help the cause. He stated, in conclusion, that financial contributions would not be required, but that co-operation was what was needed. The Mayor of Westminster afterward moved the first resolution:—"That this conference approves of the organization of a safety first campaign in the metropolitan area." This was seconded by W. Joynson-Hicks, M. P., chairman of the Automobile Association. The Mayor of Deptford moved: "That a London safety first campaign council be now elected, with power to co-opt additional members, to establish an adequate organization, and to take all necessary steps, by the appointment of committees and any other means to bring the scheme into prompt operation." H. Gordon Selfridge of Selfridge & Company, seconded this motion. Mr. Blain then suggested a basis for the council something on the following lines: Two representatives of each local authority, one a public representative and one an officer, a representative of each tramway and omnibus undertaking, a representative of each association, a representative of the railway companies having street goods vans, etc., a representative of the Metropolitan Police, a representative of the City of London Police, a representative of the motor cab industry, and several representatives of private firms. On the motion of the chairman of the Marylebone electric supply committee, it was agreed that the following should act as honorary secretaries pro tem of the new council: H. E. Blain, representing the traffic authorities; A. P. Johnson, town clerk of Hampstead, representing the civic authorities; and A. E. Cave, editor of *Municipal Journal*, representing publicity interests. In reply to a question, Mr. Blain said that the clerk of the London County Council had written that while the Council was in sympathy with the object in view, it felt diffidence as an executive body in sending representatives.

AVOIDANCE OF ACCIDENTS

Mr. Dalrymple, general manager of the Glasgow Corporation tramways, has addressed a memorandum to the members of the traffic staff, in which he makes a number of suggestions for the avoidance of accidents. He states that for some months he has been much concerned at the increasing number of accidents. Many of the staff are new to the service, while all are working under trying conditions. He is satisfied, however, that in many respects the staff could carry out their work with greater efficiency and with more satisfaction both to themselves and to the department. On both drivers and conductors he impresses the absolute necessity of taking greater care, and submits to them the following instructions: Do not, under any circumstances, run your car ahead of time. Do not run your car past stopping places when people are standing there. Do not start your car until you are absolutely certain that no one is entering or leaving. Do not ring the bell until every one is on or every one is off. Do not put your hand, when ringing the bell, in front of a passenger's face. Do not quarrel with passengers. Do not lose your temper with passengers, even under provocation. "So far as accidents are concerned," Mr. Dalrymple adds, "there are many circumstances conspiring against us at the present time. There is, of course, the inexperience of many of the staff. There is the overcrowding of cars. There is the darkening order. There is the boy in charge of the horse and cart. There is the general carelessness in the street, both on the part of pedestrians and of those in charge of vehicles. To the 'conductresses' I would say: 'Do not imagine that you know all your duties after being a week on the cars. Do not carry out your work as if you meant to leave the job to-morrow.' To the 'motresses' I would say: 'Go warily. Take plenty of time. Do not put on a notch of power until you know that the road is clear.' I should like to say to the women generally that in a short time we shall be losing more men. These men must go to fight for those who must stay at home. It is up to you to run the cars—indeed, to run the country. I should like every woman to enter the motor school."

STRIKE IN SALFORD

Salford was recently without any tramway service for two days, owing to a strike of drivers and conductors against the employment of a number of women inspectors. After negotiations, however, the men accepted the tramways committee's suggestion that the matter in dispute be referred to arbitration by the committee on production, and that, pending the decision of the arbitrators, the women inspectors should be withdrawn from the cars. The men agreed to report for work and service was resumed.

The Nottinghamshire & Derbyshire Tramways has deposited a bill for introduction into Parliament next session for authority to take over the tramway undertaking of the Corporation of Ilkeston. The purchase price has been agreed at £28,150, which is to be paid by instalments on March 1 in each year, after the date of transfer, which has been fixed to date as from Sept. 30, 1916.

LEASE OFFER ACCEPTED

The tramway committee of the Edinburgh Town Council has unanimously decided to recommend the town council to accept the offer of the lessees of the Edinburgh Tramways to sell the rolling stock, cables, and other plant to the corporation for £50,000. A sub-committee has been appointed to communicate with the Admiralty to ascertain whether there is present or prospective need for further transport facilities between Edinburgh and South Queensferry and Rosyth, and, if so, what these facilities should be, and what assistance might be available to the corporation in the event of facilities being provided.

The directors of the Dublin United Tramways (1896) have recommended the payment of a dividend of 6 per cent per annum, less tax, on the preference shares, and a final dividend of 5 per cent, less tax, on the ordinary shares for the half year ended Dec. 31, this being the same rate of distribution as at the corresponding period last year. The amount of £20,000 is set aside toward the renewal of rails, and £7,000 toward reserve and renewal fund. The sum of £13,359 is carried forward.

A. C. S.

News of Electric Railways

Traffic and Transportation
Financial and Corporate
Personal Mention
Construction News

Albany Company Upheld

Board of Arbitration Decides That the Case of Employee Discharged for Violation of Rules Was Adjudicated Fairly

That the case of Michael J. Hurley, motorman, was adjudicated fairly by officials of the United Traction Company, Albany, N. Y., and that Sec. 6 of the agreement between the company and its employees was not violated in handling the case, are the findings of the board of arbitrators which has been investigating the controversy that brought on the strike in Albany, Troy, Cohoes and Watervliet last October. The arbitrators were Lynn J. Arnold and William E. Woollard of Albany, and Mayor Cornelius F. Burns of Troy. They announced their decision on Jan. 25. In appended remarks, Judge Arnold and Judge Woollard also make this statement:

NO NECESSITY FOR STRIKE

"There was absolutely no necessity for a strike. The calling of the strike was unwise. It caused great inconvenience to the public. If the trivial differences could not have been settled by conferences between the parties directly interested they should have been settled by arbitration before calling a strike. Public service corporations and their employees must remember that they are not the only parties in interest. There is a third party to be considered, the public."

The findings as formally announced were:

"That Sec. 6 of the agreement between the parties was not violated in handling the case of Motorman Hurley.

"That the case of Motorman Hurley was adjudicated fairly by the officials of the company."

HISTORY OF CASE

The case was one involving the matter of discipline. All southbound interurban cars on the Albany-Troy line of the company are required by the company's regulations to come to a full stop (safety stop) at what is known as Garbrance Lane, a quiet well-traveled road crossing the tracks of the company and one "blind" to cars approaching from the north. For some time previous to Motorman Hurley's discharge the company had received a number of complaints of southbound cars running by this point without stopping as prescribed by the company's regulations, thus resulting in one automobile with three occupants being struck and the machine badly damaged. There were also numerous minor escapes. The situation became so bad that upon proof of Hurley's deliberate violation of the rule, he was discharged by the superintendent of transportation of the company. This led to the strike. While Mr. Burns, representing the employees on the board of arbitration, in his dissenting opinion contends that C. F. Hewitt, general manager of the company, acted in a summary manner in handling the Hurley case on appeal, Mr. Hewitt actually spent the afternoons of two days listening to the defence. As the arbitrators pointed out Hurley was actually discharged by the superintendent of transportation. His appearance before Mr. Hewitt in appeal was simply a review of the case.

The strike order went into effect in Albany early in the morning of Monday, Oct. 2. More than 800 men walked out and tied up all lines of the company in Albany and Rensselaer. Early the next morning, about 700 men employed on the lines in Troy joined in a sympathetic strike, tying up the lines in that city, Cohoes, Watervliet and Waterford. The arbitration agreement brought the strike to a settlement about noon on Wednesday, Oct. 4. The men returned to work as soon as cars could be prepared, and normal traffic was resumed about the middle of the afternoon.

$2,251,446 to Be Spent in Kansas City

This Sum Called for in the Budget of the Kansas City Railways for Track Extensions and Rehabilitation Work in 1917

The budget of the Kansas City (Mo.) Railways calls for the sum of $2,251,446 to be spent on track extensions and rehabilitation work in 1917. This sum will be apportioned as follows: way and structures, $1,303,146; equipment, $594,300; power, $354,000. The company plans the construction of 9.76 miles of extensions this year in Missouri, exclusive of special work of which there will be approximately 1 mile, bringing the total to 10.76 miles. This work, as planned, will cost $572,796.

In addition, the annual budget provides for $241,578 to be spent in rehabilitation work. This work is to be done on Tenth Street, Twenty-seventh Street, Prospect Avenue, Eighteenth Street, St. John Avenue, Belleview Avenue, Independence Avenue, Ninth Street, McGee Street, State Line, Forty-first Street, The Paseo extension, Swope Park and Hardesty Avenue.

Many renewals of special work are to be made at a total cost of $64,557, while it is planned to weld a total of 1610 joints by the electric welding process. The cost of this work will be $19,700. Welds will be made on Brooklyn Avenue, Twelfth Street, Fifteenth Street, Troost Avenue, Grand Avenue, Belleview Avenue, Ninth Street and Summit Street.

For general track repairs the sum of $143,722 is set aside. In this work, a total of 85,818 ft. of repair work is provided for on thirty-five streets.

Among the miscellaneous items provided for in the budget at a total cost of $89,700 are the following: Concrete covering on Main Street viaduct, $7,000; new asphalt plant, $21,000; two Indianapolis welders, $1,200; one concrete mixer, $2,000; track tools, $1,000 and rail not under contract, $57,500.

For general maintenance work, $185,000 is provided.

Toward the close of the year it is proposed to purchase twenty-five additional cars, the cost of which will approximate $150,000. It is also probable coasting clocks or recorders will be installed on the cars.

Progress on East Bay Franchises

Rapid progress is being made in aid of the efforts to accomplish a re-adjustment and re-settlement of the franchise relations of the San Francisco-Oakland Terminal Railways, Oakland, Cal., with the East Bay communities. Within the last few weeks the city of Alameda has adopted a charter containing re-settlement provisions, substantially similar to those of Oakland, which provide for an indeterminate grant as noted in the ELECTRIC RAILWAY JOURNAL of Nov. 18, page 1071. The Board of Freeholders of Richmond has adopted the same provisions as are found in the Alameda charter, and the new charter of Richmond containing these provisions will be submitted to the electors for their approval in April. The amendments to the Oakland charter and to the charter of Berkeley have been introduced in both houses of the State Legislature, and early action is expected on them. Thus in a few months, amendments to the charters of Oakland, Berkeley, Alameda and Richmond have been proposed, in three instances have received the approval of the people, and may be expected to be ratified at this session of the Legislature. When this shall have been accomplished, these communities will be authorized by law to negotiate with the company for the surrender of its existing franchises and the acceptance by it of a re-settlement franchise.

Toledo Marking Time

Mr. Doherty Unable to Resume Franchise Negotiations for a While

Councilman Gus A. Hein introduced an ordinance in the Council of Toledo, Ohio, on Jan. 15, providing for the payment of rental for the use of the streets at the rate of $185 a day by the Toledo Railways & Light Company for the first year after its franchise expired, this amount to be increased 3 per cent each succeeding year. It further provides that the money thus received be placed in a special street improvement fund to be used to pave between the company's tracks, where pavements are repaired or new pavements are laid.

Because of the uncertainty in regard to a franchise, the company has refused to assume the expense of paving its right-of-way since the old franchise expired. Councilman Hein claims that it is now indebted to the city in the sum of $154,000 for paving and that the city cannot continue to advance funds for this purpose.

Henry L. Doherty, chairman of the board of the company, has notified the street railway commission that it will be some time before he will be able to resume work with it in formulating a new arrangement for the street railway. His other extensive utility interests demand his attention at the present time.

Pays Under Protest

Puget Sound Company Protests Gross Earnings Tax—City Moves to Enforce Franchise Provisions

The Puget Sound Traction, Light & Power Company, Seattle, Wash., recently offered $64,387, under protest, to the city of Seattle. This sum represents 2 per cent of the gross earnings of the company in 1916. The company stipulated that the payment is made only with the understanding that the city lives up to an agreement reached at a conference in 1915, by which the company was to pay a gross income tax under protest, and to plank rights-of-way, instead of paving them, pending a hearing of the Public Service Commission on a petition to be relieved of these franchise obligations. In the event that the city does not agree to this, and insists on instituting suit to require the company to pave its right-of-way, the tender of the gross earnings tax is to be withdrawn. The amount submitted represents a percentage on gross earnings of $2,900,831. As compared with 1915, the earnings of the company showed an increase of $140,875. Comparative figures of the 2 per cent gross income tax paid since 1912 follow: 1916 (amount offered under protest), $64,387; 1915, $51,581; 1914, $72,954; 1913, $71,724; 1912, $59,529. The matter of acceptance of the sum tendered was referred by the Council to the franchise and the finance committees, and was in turn referred to Hugh M. Caldwell, the Corporation Counsel, for an early report.

The city of Seattle will institute suit against the Puget Sound Traction, Light & Power Company to enforce that provision of the company's street railway franchise which requires the paving of right-of-way with the same material and at the same time the city paves the remainder of its streets. A. L. Valentine, superintendent of public utilities, recently recommended to the board of public works that certification be made to the legal department that the company has failed to pave First Avenue South, between Stacy and Horton Streets, and the recommendation was approved by the board. Since the company petitioned the Public Service Commission to be relieved of certain of its franchise obligations, it has refused to do other than to plank right-of-way until the commission disposes of its petition. Hugh M. Caldwell, corporation counsel, recently held that the company should be required to comply with its franchise obligations, until a competent court relieves it of such obligations. His announcement that he was ready to begin suit against the company to enforce its franchise obligations led to the designation of a particular street by the Board of Public Works, on which the litigation will be based.

Conference Asked in Minneapolis

President Lowry of Twin City Company Seeks to Discuss Valuation and Earnings with City

Horace Lowry, president of the Twin City Rapid Transit Company, Minneapolis, Minn., has written to the special committee of the City Council on street railway matters and extensions requesting to be permitted to appear before the committee to discuss the questions of valuations and earnings of the Minneapolis Street Railway. His letter follows:

"In view of the evident misconception back of various statements relative to the valuation of the property of the Minneapolis Street Railway and its net earnings, we feel at the present time we should advise you of our desire to appear before your committee at a hearing to be held at an early date for the purpose of considering and discussing these matters with your committee.

"We do not expect the city to agree upon a valuation under the proposed franchise that will not from the very outset yield a substantial net surplus to be participated in by the city which should rapidly increase from year to year as the city grows and the street railway system is extended to meet such growth. This expectation is amply justified by recent operations of the company.

"We suggest that new lines and extensions of existing lines to be constructed in the immediate future should be considered as a whole, in order that such new lines and extensions should become a part of the best comprehensive transportation system for the city at large. We strongly recommend this plan for a specific program in dealing with a problem of such scope, believing that local interests will not suffer thereby and that the city as a whole will be greatly benefited.

"It is our desire to co-operate with your committee and other bodies, giving consideration to these questions and others involved in a new franchise, to the end that Minneapolis may be provided with a street railway system which will give the best possible public service."

Up to Jan. 20 no date had been set for a hearing.

On that date, however, the Council committee on street railway matters and extensions did decide to begin on Jan. 29 spending each afternoon of the week going over the route of the proposed street railway extensions. It was announced that before these inspections were begun there would be a conference between the chairman of the committee, the city attorney and city engineer and the head of the street railway so that the company's conception of what extensions are reasonable may be obtained and put before the committee.

Wages Adjusted on Lockport and Empire Lines

The question of wages for the employees of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., was opened at the request of the men that, effective Oct. 1, 1916, their contract be revised with reference to rates of pay to cover 35 cents an hour in passenger service and 36 cents an hour in freight service. After a series of conferences the company voluntarily granted an increase of 1 cent an hour in passenger and freight service, the increase to be effective as of Oct. 1, 1916, making the rate 31 cents an hour in passenger service and 35 cents an hour in freight service.

Under date of Dec. 23, the company and the representatives of the Brotherhood of Locomotive Engineers and Order of Railway Conductors, executed an agreement to arbitrate the matter of an additional increase of 1 cent an hour in both classes of service. On Jan. 8, 1917, the board of arbitration awarded the men an additional 1 cent an hour in passenger service, with no increase in freight service, making the rates of wages, retroactive to Oct. 1, 1916, 32 cents an hour in passenger service and 35 cents an hour in freight service. The wage scale as just noted applies also on the Empire United Railways, Inc., Syracuse, except that the increase, voluntarily and by award of the board of arbitration, is retroactive to May 1, 1916. These increases are according to agreement to remain in force and effect until May 1, 1917.

Cincinnati Agreement Discussed

The proposed agreement between the Cincinnati (Ohio) Traction Company and the city, providing for the operation of the municipal loop by the company, was discussed at a recent conference of members of the Rapid Transit Commission and a number of officials and business men. Both Walter A. Draper, vice-president of the company, and E. W. Edwards, chairman of the commission, agreed to do everything possible to reach an agreement, so that it may be submitted to a referendum vote at the regular election on April 17. Mr. Draper objected to fixing a 5-cent fare to points outside of the city, as complications would result if it should be decided in the future to extend the loop to distant suburbs. The Ohio Traction Company owns $2,000,000 of capital stock of the Cincinnati Traction Company and it was suggested that matters would be simplified by the consolidation of the companies. Mr. Draper said that the company would not profit through the construction of the loop, inasmuch as the possible patrons of the loop are already patrons of the company.

Cleveland Service Considered

Mayor Demands Better Service, but Insists That 3-Cent Fare Shall Continue

In an address before the Tippecanoe Club on the evening of Jan. 29, Mayor Harry L. Davis of Cleveland, Ohio, in announcing his candidacy for a second term, arraigned the Cleveland Railway for the character of service given for some time and declared that it must make an improvement or be refused a renewal of franchise in 1919. At the same time he insisted that the 3-cent fare be maintained.

President Stanley of the company had previously been quoted as saying a settlement of the operating and maintenance deficits would be demanded at an early date. The operating deficit is $195,075 and the maintenance overdraft or deficit, $268,918. On Jan. 1, 1917, the interest fund was $545,438. The scrapping of the Cedar Avenue power house will add $20,000 a month to the monthly payments to be made from the maintenance fund.

It is contended that 120 more cars would be needed in constant operation to carry the increased traffic without undue crowding. The city has supervision over this and could have made it possible to take care of the traffic. To do so, however, would have increased the operating expense and might have endangered the fare. Much complaint has been made in regard to crowded cars, but the company is unable to relieve the situation because of the control over service exercised by the city.

At the meeting of the City Council on Jan. 29 Fielder Sanders, street railway commissioner, asked that a $5,000,000 bond issue for a subway terminal for the street railway lines be submitted to the voters at the next election. He intimated that he would oppose the plan of having the Cleveland Railway build the terminal, but desires the company to operate it under lease after the city builds it.

Commissioner Sanders' View

Mr. Sanders expressed the opinion recently that if the Cleveland Railway furnished the service the City Council is demanding just now, the fare would have to be advanced to the maximum allowed by the Tayler franchise. The Council had instructed Mr. Sanders to have traffic checked on several routes with the idea of demanding an improvement in the service and he gave expression to the opinion about fares in his reply. The increase in the traffic during the last year has been 10 per cent, whereas the normal increase is only 5 per cent. The company made arrangements for the latter increase, but the abnormal use of the cars has resulted in crowding. Mr. Sanders declared that the same conditions exist in other cities, particularly Boston and Philadelphia, which cities he visited recently.

Mr. Sanders put checkers at work on the St. Clair Avenue line on Jan. 22. Improvements in schedules have been made on the line two or three times within the last year, but the Council insisted on another investigation. Mr. Sanders was also instructed to revise schedules on the lines affected by the construction of the underground approaches to the Superior-Detroit bridge, in order that blockades caused by accidents and derailed cars may be avoided. Cars are operated over temporary tracks near the bridge on both sides of the river and some trouble has already been occasioned from this arrangement.

Strike Prevention Bill Introduced

A bill providing for State regulation of employment with a public service corporation was introduced on Feb. 1 by Assemblyman Schuyler M. Meyer of New York. The measure, according to Mr. Meyer, was drafted under the supervision of the New York Chamber of Commerce and has been indorsed by the Chamber of Commerce of the United States and the Merchants' Association. The original plan, as proposed by Henry R. Towne of the Merchants' Association, was described in the ELECTRIC RAILWAY JOURNAL of Sept. 30, 1916, page 692.

The bill provides that public service corporations and their employees must enter into reciprocal contracts of employment for a period of one to three years after a short period of probation, and that the corporations must not dismiss employees nor employees withdraw from service except for causes explicitly stated in the bill.

Under its provisions a public service corporation may dismiss an employee for misconduct defined in the bill as proper cause for discharge, for lack of employment due to slack business upon thirty days' notice, or in case of immediate discharge upon the payment of two weeks' salary; also for disability of the employee, with the proviso that when this is not due to negligence on his part he shall receive thirty days' wages on being dismissed. Discrimination because of membership in a labor organization is forbidden.

Employees may terminate their service for valid family reasons, personal necessity or disqualifying illness, certified by a board of award, or when no cause is given on thirty days' notice to the corporation and with its consent.

Hugh MacRae to Retire

Hugh MacRae, of Hugh MacRae & Company, Wilmington, N. C., president of the Tidewater Power Company, has concluded to dispose of his interest in the company. This decision is understood to have grown indirectly out of the situation which was created last July when the motormen and conductors of the power company went on strike. The men on returning to work signed an agreement to abide at all times by the decisions of a citizens' committee of 100 which pledged its support to Mr. MacRae. Mr. MacRae's opinion evidently is that the unqualified public support to which he felt himself entitled is lacking, for in a recent communication to the Council he said:

"For some time it has seemed clear to me that certain influences which are frequently brought to bear on individual members of every Council, and are often made to appear as expressing public sentiment, spring from sources which are antagonistic to me personally. In order, therefore, to remove as far as possible these obstacles and so that the way may be kept free for your co-operation with the company along lines that will bring the greatest good in the development of the community, I have concluded at some time in the near future to dispose of my interest in the Tidewater Power Company. It seems best to make the announcement at this time when the company is not under pressure from any direction, and everything as far as I know is harmonious. I would not care to arrive at a decision at any time when it would appear to be retiring under an attack."

In a letter to Rev. Thomas P. Noe, chairman of the committee of 100 which in July inquired into the affairs of the company, Mr. MacRae said in part:

"I appreciate most highly the findings of your committee, but personally I do not feel assured of the physical strength or the political influence necessary to carry out the different steps which would be essential to the protective program recommended by your committee.

"It is my belief that perhaps four-fifths of the citizens of Wilmington would fully concur in the report of your committee; but the other fifth would in opposition appear to be more active. I have decided that it would be best at some suitable time in the near future to dispose of my interests in the Tidewater Power Company, feeling that the policies which I hoped to carry out would not be wise ones under the present circumstances."

W. S. Barstow Management Association

The W. S. Barstow Management Association has been incorporated for the purpose of supervising the management of the subsidiary properties of the Eastern Power & Light Corporation and the General Gas & Electric Company. The directors of the new company are W. S. Barstow, J. B. Taylor, L. H. Tyng, E. Lovett West, O. Clement Swenson, E. M. Gilbert and Thomas Cheyne. A meeting of the association will be held shortly to organize and elect officers. This company will have managerial supervision over the following companies: Reading Transit & Light Company and Metropolitan Electric Company, Reading, Pa.; Pennsylvania Utilities Company, Eastern Pennsylvania Power Company and Easton Gas Works, Easton, Pa.; Binghamton Light, Heat & Power Company, Binghamton, N. Y.; Sayre (N. Y.) Electric Company; New Jersey Power & Light Company, Dover, N. J.; Rutland Railway, Light & Power Company, Western Vermont Power & Light Company and Pittsford Power Company, Rutland, Vt.; Claremont Power Company, Claremont Railway & Lighting Company and Colonial Power Company, Claremont, N. H.; Sandusky Gas & Electric Company, Sandusky, Ohio; West Virginia Traction & Electric Company, City & Suburban Gas Company and City Railway, Wheeling, W. Va.; Northwestern Ohio Railway & Power Company, Port Clinton, Ohio; Vincennes Electric Company and City Lighting Company, Vincennes, Ind.

The combined annual gross earnings of the foregoing properties in 1916 were approximately $7,000,000. W. S. Barstow & Company, Inc., New York, N. Y., who have heretofore supervised the management of the subsidiary properties, will continue in general executive charge and also control their financial operations.

Strike at Hamilton.—Motormen and conductors on the local lines of the Ohio Electric Railway in Hamilton are out on a strike. New men have been employed and some of the cars have been kept in operation.

Eight-Hour Bill in Ohio.—Representative Henry Ott has introduced a bill in the Legislature of Ohio limiting the workday of motormen and conductors on both street and interurban railways to eight hours. A similar bill failed before the previous Legislature.

Fort Smith Fare Bill Killed.—The bill introduced in the Arkansas Legislature to regulate street car fares in Fort Smith and Van Buren has been killed by an adverse committee report in the Senate. The bill would have fixed a 5-cent fare for Fort Smith and Van Buren, with 100 tickets for $3.50. It was opposed by the company and the progressive citizens of Fort Smith and vicinity. In addition to fixing a 5-cent fare, the bill required two men as the crew on every car.

New Route into Cleveland.—It is reported that the Cleveland, Painesville & Eastern Railway will sign a contract with the Cleveland & Youngstown Railroad whereby cars of the former will enter Cleveland over the tracks of the Cleveland & Youngstown Railroad and use the new station that is to be built by the Van Sweringen interests. The connection between the roads will probably be made near South Euclid. This will open up an immense tract of land for allotment purposes.

New Rapid Transit Line to Open.—The Interborough Rapid Transit Company under direction of the Public Service Commission for the First District of New York began operation on the new Astoria rapid transit line at noon on Feb. 1. This line is a three-track elevated railroad extending from the Queensboro Bridge Plaza in Long Island City north to Ditmars Avenue, Astoria. Its opening affords relief to a district not now served by any rapid transit line. The new line is three track for its entire distance and express service will be provided in the morning and evening hours. The line has cost in round figures, including track installation and station finish, exclusive of equipment, $1,350,000.

I. C. C. Valuation Methods Criticised.—At a hearing in Washington on Jan. 29 on the findings of the Interstate Commerce Commission in the case of the valuation of the Atlanta, Birmingham & Atlantic and the Texas Midland Railways, counsel for the companies charged that the commission failed to obey the law in making valuations and failed to include a great many items which it should have included. Whether trackage rights of a railroad over connecting lines should be included, and, if so, at what figure, was one of the points debated, counsel for the Texas Midland asserting that 14 miles in the road's main line had been omitted because the road did not own the property outright but merely had leased trackage rights over this stretch.

Canadian Hydro-Radial Lines Approved.—Most of the municipalities along the Canadian shore of Lake Erie between Port Colborne and Bridgeburg, Ont., have approved the plan of guaranteeing bonds for a government-owned hydroelectric radial railway between these two points. Bridgeburg, Fort Erie and Port Colborne, the largest towns along the proposed route, have guaranteed more than $2,000,000 in bonds to pay for the cost of construction. The city of Hamilton, Ont., defeated the proposition for the proposed hydroelectric line between Toronto and the Niagara frontier, but Sir Adam Beck, of the Ontario Hydroelectric Commission, declares this defeat will not have a depressing effect upon the plan as construction work will not be started until after the end of the European war.

Niagara Power Situation Serious.—Owing to the serious shortage of electric power in western New York, due to the embargo placed by the Canadian Government on the exportation of Canadian-Niagara power to American consumers and increased demand for power from American-Niagara generating companies, the International Railway, Buffalo, N. Y., has been forced temporarily to suspend service over its Niagara Falls local lines for several hours a day during the last few weeks. On one occasion the company was without power to operate cars from 6 to 7.45 a. m., and from 3.20 to 5 p. m. The company is taking power from the Niagara Falls Power Company to operate its Niagara Falls local lines, and the Toronto & St. Catharines Railway is supplying power for the Park & River division between Chippawa and Queenstown, Ontario, along the Canadian gorge.

President McCulloch Joins St. Louis Advertising Club.—When Richard McCulloch, president and general manager of the United Railways, St. Louis, Mo., became a member of the Advertising Club of St. Louis recently he placed the company's physical equipment and men at the disposal of the advertising men for use in their night parade at the convention of the Associated Advertising Clubs of the World, which will be held in St. Louis in June. It is planned to make the parade surpass in magnitude and splendor anything ever attempted before in the United States. Many inquiries have been received from advertising clubs in other cities in regard to the parade. Details are now available, and the fact that those who exhibit will be able to have their floats lighted with electricity will provide an ample outlet for settings which could not be produced under other circumstances.

Programs of Association Meetings

New York Electric Railway Association

The quarterly meeting of the New York Electric Railway Association has been arranged for March 2 at the Hotel Astor, New York, N. Y. There will be a business meeting at 10.30 a. m. at the hotel and a dinner at the same place at 7.30 p. m.

New England Railroad Club

A review of steam railroad electrification history will be the feature of the next regular monthly meeting of the New England Railroad Club, which will be held at the Hotel Brunswick, Boston, Mass., on Feb. 13. The principal address will be delivered by Frank H. Shepard, special representative of the Westinghouse Electric & Manufacturing Company, after which moving pictures of the latest installations will be shown by Q. W. Hershey of the heavy traction department of the Westinghouse Company.

Financial and Corporate

Annual Report

British Columbia Electric Railway, Ltd.

The income statement of the British Columbia Electric Railway, Ltd., Vancouver, B. C., for the year ended June 30, 1916, follows:

Income	£258,206
Registration fees, etc	195
Total	£258,401
Renewals—maintenance	£102,236
Directors' fees	998
Special remuneration to chairman's assistant	1,367
Office rent, salaries, etc	5,306
Income tax provision	10,000
Trustees' fees	874
Capital amortization fund	2,655
Total	£123,437
Balance	£134,964
Balance brought forward from previous year	6,666
Transfer from reserve fund	70,000
Total	£211,630
Interest on debentures and debenture stock	132,771
Balance	£78,859

The gross income of this company for the year ended June 30, 1916, was only £258,206, as compared with £370,000 for the preceding year and £560,000 for the year ended June 30, 1914—a decrease in the two years since the outbreak of war of more than 50 per cent. This was due mainly to two causes—namely, a reduction in the population of the districts served, owing to the extraordinary proportion of the manhood of the province voluntarily enlisted in the army, and the continuance of the unfair competition of jitneys.

About 35,000 soldiers left British Columbia for overseas service, of whom probably 25,000 were from the company's territory. A further large number of people more or less dependent on them also left, so that the population decreased by fully 30 per cent. It is deemed reasonable, however, to look for an increase in profits on the return of the troops almost as rapid as the decrease was. The stockholders will not get back all at once the dividend formerly received on the deferred ordinary stock, but it is felt that they should again receive a moderate return on the money invested in that stock within a year or two of the end of the war.

Although after Jan. 1 the competition from jitneys was less acute than in the previous year, these cars are still depriving the company of earnings amounting to approximately £70,000 a year. Another serious factor is the large increase in operating costs. During the last fiscal year the shortage of men and the increase in prices of commodities created a difficult situation. These conditions seriously affected the employees, and although the agreement with them still had a few months to run, it was decided to grant an immediate increase of wages. This concession involves an increase in working expenses of more than £20,000 per annum, and is to remain in force until June 30, 1918. During the last year capital expenditures fell off from £175,110 to £26,980.

A more agreeable side of the situation is the fact that during the four months of the current year there was an increase in net earnings over the same period last year of more than £30,000. The improvement commenced in February, and, although varying in amount, was continuous month by month up to and including October, which is the last return received. It is thought that there are grounds to hope that this increase in earnings may continue on a sufficiently large scale to enable the company this year to meet the dividend on the 5 per cent cumulative preference stock without having recourse to the reserve fund. This had to be drawn upon for £70,000 in the last year to permit the payment of £72,000 in dividends on such stock.

B. R. T. Taxes Up 45 Per Cent

Analysis of Six Months' Results Shows Higher Operating Costs, Taxes and Interest

At the annual meeting of stockholders of the Brooklyn (N. Y.) Rapid Transit Company on Jan. 26, President T. P. Williams made a statement explaining the unfavorable showing of the company for the first half of the present fiscal year. It is not customary for the company to submit a report at the annual meeting, but this time it was deemed desirable to acquaint the stockholders with the causes of the showing thus far made.

For the six months ended Dec. 31, 1916, the gross operating revenues of the system were $14,880,669, an increase of $832,224 (5.92 per cent) over the operating revenues of the same period of 1915. The operating expenses were $8,296,634, an increase of $580,024. Of this increase nearly $500,000 was in wages paid to transportation employees. The ratio of operating expenses to revenues was 55.75 per cent as compared with 54.93 per cent for the same period of the preceding year. The net revenue was $6,584,035, an increase of $252,200. Up to this point the comparison is not unfavorable, President Williams said, especially in view of the facts that the unit rate of wages was very materially increased, and that the prices of materials used in operation were also considerably higher.

After deducting taxes and interest, however, the surplus income for the system during these six months was $2,755,684, a falling off of $585,849 from the surplus income of the corresponding six months of 1915. In other words, although gross revenues during the period increased $832,224, the net result was $585,849 less income available for dividends. This showing was caused by the largely increased amounts charged to taxes and interest—taxes showing an increase of $391,206 (45.72 per cent), and interest showing a net increase of $441,312. Notwithstanding these additional burdens the system's net income available for dividends was more than $500,000 in excess of the dividend requirements, at the rate of 6 per cent per annum, for this period.

It is reasonable to suppose, President Williams stated, that the operations for the remaining six months of the fiscal year will make a better relative showing. Part of the increase in wages became effective on Jan. 1, 1916, and appeared in last year's figures. Part of the increased taxes began to be absorbed in March of last year. Additional interest charges (substantially at the present rate) became effective in January a year ago, and are not likely to be materially increased during the current six months. Therefore, if the passenger earnings continue to increase at the present rate, the system ought to show for the final six months of this fiscal year as good results, if not better, than those for the same period of 1916.

WHAT CAUSED LOWER NET INCOME

In discussing the factors in the showing for the last six months, President Williams continued as follows:

"There will be, I am sure, no dissent among stockholders as to the wisdom or justice of materially increasing the wages of employees. The company has long adhered to the policy of sharing its prosperity with its workers, and the advantage of that policy was conspicuously demonstrated last summer, when our men remained loyal to their work while the employees of practically all the other street railways in Greater New York were disaffected or went on strikes.

"In the matter of taxation, we in common with other property owners and corporations are paying the penalties of increasing expenditures for the support of government When new taxes are to be levied the first victim is likely to be the public service corporation, notwithstanding the conceded fact that every additional burden thus imposed limits and restricts the ability of the corporation to render public service. By way of increased assessments and new laws, our taxes for the year have been increased nearly $600,000, and they are to-day about 30 per cent of our income remaining after paying operating expenses, rentals and interest.

"The increase in interest charges is due to new rapid transit properties placed in operation under our recent contracts with the city. Less than one-third of the expenditures which we are required to make under those contracts represents properties yet in operation, and these properties are regarded as the least productive of the new lines. The results of this partial operation, however, have been particularly gratifying. During the six months ended Dec. 31, 1916, the passenger receipts of the New York Consolidated Railroad (the constituent company which operates the rapid transit railroads under contracts with the city) have increased more than 17 per cent, and the indications are that the preliminary estimates of earning capacity will be more than realized when the entire new rapid transit system is in operation. The Broadway-Manhattan subway will, it is likely, be ready for operation during the current year and ought to be distinctly helpful."

Strickland Lines Consolidate

Texas Traction Company and the Southern Traction Company Unite as the Texas Electric Railway

The consolidation of the Texas Traction Company and the Southern Traction Company, Dallas, as the Texas Electric Railway was voted unanimously at a meeting in Dallas on Jan. 31. J. F. Strickland has been elected president of the Texas Electric Railway. There were represented at the meeting 26,820 out of 30,000 shares of stock of the Texas Traction Company and 67,298 out of 70,000 shares of stock of the Southern Traction Company. Final details of the consolidation will be worked out at a meeting in Chicago during the week beginning Feb. 5.

The Texas Electric Railway was chartered in Texas in July, 1916, with a capital stock of $10,500,000, and at the meetings of the stockholders of the Southern Traction Company and the Texas Traction Company held in Dallas on July 18 action of the directors of the company in arranging for the consolidation under the name of the Texas Electric Railway was formally ratified. Circumstances over which the participating companies had no control prevented the carrying out of the deal at that time. It is now reported unofficially that the consolidation just ratified has as its basis substantially the same terms and conditions as the proposed consolidation of last July, which was noted in the ELECTRIC RAILWAY JOURNAL for July 29, 1916.

Atlanta Financing Approved

Two of the Three Petitions of the Affiliated Atlanta Companies Allowed—The Other Under Advisement

The Georgia Railroad Commission on Jan. 24 approved the $459,000 bond issue petitioned by the Georgia Railway & Power Company and the $283,000 bond issue asked by the Georgia Railway & Electric Company. The commission did not act upon the petition of the Georgia Railway & Power Company asking permission to issue $420,000 in scrip or non-interest-bearing notes to pay accumulated dividends upon its first preferred stock. The commission is investigating questions of law and public policy in connection with this petition, and is not expected to announce any decision before the next meeting of the commission, which will be held on Feb. 13.

The petition of the Georgia Railway & Power Company approved by the commission authorizes that company to issue $459,000 par value of first and refunding bonds for the reimbursement of the treasury for funds spent in the period from Jan. 1 to Oct. 31, 1916, for extensions and purchase of new property. These bonds are a part of an issue of $30,000,000 that was approved by the commission in 1914. The expenditures which the present issue is to meet, cover the extension of power lines, the purchase of hydroelectric sites and similar disbursements within the State of Georgia and outside the 7-mile limit of the city of Atlanta.

The petition of the Georgia Railway & Electric Company, which is leased by the Georgia Railway & Power Company, approved by the commission, authorizes that company to issue $283,000 par value of refunding and improvement forty-five-year 5 per cent bonds under a mortgage approved by the commission in 1909. This amount is to reimburse the treasury of the company for money that the company expended for extensions and improvements within the 7-mile limit of the city of Atlanta during the period from Jan. 1 to Oct. 31, 1916.

The original applications of the companies to the commission were referred to at length in the ELECTRIC RAILWAY JOURNAL of Jan. 13, page 92.

Birmingham Railway, Light & Power Company, Birmingham, Ala.—The Supreme Court of Alabama has decided that the Alabama Public Service Commission was within its jurisdiction in ruling that the merger of the Birmingham Railway, Light & Power Company and the Birmingham, Ensley & Bessemer Railroad was consistent with the public interest. The decision is in effect that the Brown bill authorizing the Public Service Commission to approve mergers when consistent with the public interest was constitutional and that the action by the commission in this case was within the provisions of that bill. The commission in the fall of 1916 authorized the substitution of the Birmingham-Tidewater Railway, the entire capital stock of which is owned by the Birmingham Railway, Light & Power Company, for J. D. Kirkpatrick as purchaser of the Birmingham, Ensley & Bessemer Railroad at foreclosure sale. References to the sale of the property under foreclosure and to the subsequent negotiations for turning it over to the Birmingham Railway, Light & Power Company were contained in the ELECTRIC RAILWAY JOURNAL for Jan. 15, April 1 and 8, and Sept. 9, 1916.

Chicago (Ill.) Railways.—Chairman Henry A. Blair of the Chicago Railways has reported to the bankers' syndicate purchasing $1,700,000 of the company's first mortgage bonds that for the twelve months ended Nov. 30, 1916, gross revenues showed a gain of $2,917,148 or 9.2 per cent, while there was an increase in net revenues of $1,555,183 or 14.4 per cent over the twelve months ended Nov. 30, 1915.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—The Public Service Commission of Illinois has authorized the Chicago, North Shore & Milwaukee Railroad to issue $170,000 of equipment gold notes, the proceeds to be used for the purchase of fifteen steel cars.

Columbus Railway, Power & Light Company, Columbus, Ohio.—At the annual meeting of the stockholders of the Columbus Railway, Power & Light Company on Jan. 23, it was decided to increase the number of directors from eleven to fifteen. Norman McD. Crawford of the E. W. Clark Management Corporation was chosen as a member of the board. He has been a vice-president of the company since November, 1916, and will act as president of the company during the absence of President McMeen in California on sick leave.

Columbus, Delaware & Marion Railway, Cincinnati, Ohio.—Eli M. West, receiver of the Columbus, Delaware & Marion Railway, has been ordered by the court not to pay interest on the second mortgage bonds of the company, due on Feb. 1, the interest totaling $23,000. This action was taken in line with a motion by holders of the first mortgage bonds, on which interest was defaulted last November, that no interest be paid on the second mortgage bonds. There are $920,000 of the second mortgage bonds outstanding, and the holders of these are now expected to ask foreclosure and wind up the receivership, which has been in existence for eight years.

Jacksonville (Fla.) Traction Company.—The directors of the Jacksonville Traction Company at their meeting on Jan. 15 did not declare the dividend on the $500,000 of 6 per cent cumulative preferred stock normally payable on Feb. 1. Last August only three-quarters of 1 per cent was paid. According to an official statement the earnings of the company have shown some improvement during the last few weeks, but in the opinion of the board conditions did not warrant any dividend at this time. It is explained that the prosperity of the city depends largely on the export business, which, due to the high rates of shipping brought about by the war, has as yet failed to show substantial improvement. Every effort has been made to reduce the operating expenses without curtailing service or proper maintenance. It is pointed out that Jacksonville is an important wholesale distributing center, and that a return to normal conditions should improve the earnings of the company.

Middle West Utilities Company, Chicago, Ill.—The Middle West Utilities Company has declared an initial quarterly dividend of one-half of 1 per cent in cash and a semi-annual dividend of 1 per cent in common stock on its common stock, both payable on April 2 to stock of record of March 15. In announcing the dividend policy of the company, Mr. Insull said: "The Middle West Utilities Company is growing rapidly, and the character of its business is such that large amounts of new capital are required, all of which is employed at a return far greater than 4 per cent a year. It has been calculated that a portion of the surplus earnings invested in the property and represented by the common stock dividends, will accomplish the twofold object of lessening the requirements of outside capital, and greatly strengthening the equity behind the company's senior securities and the standing thereof. From the viewpoint of the common stockholder surplus earnings so invested will earn him a larger return than would be prudent to pay in cash for a long time to come. With these objects in view, the board of directors has inaugurated this dividend policy, and naturally expects, from time to time, to disburse larger dividends in common stock as the increase in earnings and surplus may justify."

Muscatine, Burlington & Southern Railroad, Davenport, Iowa.—The report has been revived that the United Light & Railways Company is considering the purchase of the Muscatine, Burlington & Southern Railroad, formerly the Muscatine North & South Railway, a steam road between Muscatine and Burlington. In April, 1916, officials of the Tri-City Railway & Light Company, which is controlled by the United Light & Railways Company, were approached by officials of the Muscatine North & South Railway relative to the question of power. R. J. Denman, an officer of both the Tri-City Railway & Light Company and the United Light & Railways Company, inquired into the power matter, but stated then that there was not the slightest possibility of the United Light & Railways Company taking over the property.

New York State Railways, New York, N. Y.—The New York Stock Exchange has listed $6,532,000 of additional fifty-three-year consolidated mortgage 4½ per cent bonds of the New York State Railways, series A, due on Nov. 1, 1962, making the total listed $13,457,000, of which $12,748,000 were outstanding on Dec. 31, 1915. The additional bonds represent expenditures for additions, betterments, etc., including $3,075,000 yet to be made.

Okmulgee (Okla.) Interurban Railway.—An option for the purchase of the Okmulgee Interurban Railway has been sold by the Lambert interests to O. R. B. Pace, Sherman, Tex.; C. F. Hopkins, of the Union National Bank, Tulsa, Okla., and C. W. Goree, Okmulgee. The purchasers of the option announce that the line is to be made the nucleus of an interurban system which will reach Tulsa and Oklahoma City. Lake Park is also included in the option.

Orleans-Kenner Electric Railway, New Orleans, La.—The city of New Orleans is said to have under consideration the question of conducting negotiations for the purchase of the Orleans-Kenner Electric Railway. Practically all the line is outside the city, but the road is desired as an annex to the public belt system. I. D. Moore, city attorney, is said to have rendered an opinion to the effect that the Public Belt Commission would be within its rights in acting in the matter.

Pacific Gas & Electric Company, Sacramento, Cal.—The National City Company and Harris, Forbes & Company, New York, N. Y., are offering for subscription $3,060,000 of general and refunding mortgage 5 per cent gold bonds of the Pacific Gas & Electric Company dated Dec. 1, 1911, and due on Jan. 1, 1942.

Portland & Oregon City Railway, Portland, Ore.—There has been filed for record in favor of the Security Savings & Trust Company, Portland, as trustee, a deed securing an issue of $350,000 of bonds by the Portland & Oregon City Railway, the proceeds to be used to extend the railway from Dedham station to Oregon City.

Rochester Railway & Light Company, Rochester, N. Y.—The merger of the Canandaigua Gas Light Company, the Despatch Heat, Light & Power Company, the Eastern Monroe Electric Light & Gas Company, and all but the electric railroad property of the Ontario Light & Traction Company into the Rochester Railway & Light Company, has been approved and payment partly provided for through an issue of securities by the last-named company in an order of the Public Service Commission at Albany. The Rochester Railway & Light Company is authorized to issue $750,000 of its common stock at par, which the Mohawk Valley Company is authorized to purchase. The proceeds of the sale will be used by the Rochester company to pay $50,000 for the outstanding stock of the Canandaigua company, $400,000 for the outstanding stock of the Despatch company and $250,000 for that of the Eastern Monroe company. For the property and franchises other than the electric railroad of the Ontario Light & Traction Company, the Rochester company will pay $178,500. Upon the merger of the three companies their stock will be cancelled.

Seattle (Wash.) Municipal Railway.—According to the report of A. L. Valentine, superintendent of public utilities, the municipal lines of Seattle, Division "A" and Division "C," were operated during December, 1916, at a loss of $2,393. During the entire year of 1916, according to Mr. Valentine's report, the lines were operated at a total loss of $29,417. During May and June both Division "A" and Division "C" were operated at a profit more than sufficient to pay the operating cost, but not sufficient to cover the interest. In all other months the revenues were not sufficient to cover the operating cost. The city of Seattle began the operation of the municipal lines on June 1, 1914, and for the remainder of that year there was a loss of $14,580. The loss in 1915 was $41,389. The total loss for the two and one-half years has accordingly been $85,387.

St. Lawrence International Electric Railroad & Land Company, Alexandria Bay, N. Y.—The St. Lawrence International Electric Railroad & Land Company is defunct. On Aug. 5, 1916, the Northern New York Utilities, Inc., acquired the lighting property for $40,000 at mortgage foreclosure sale, obtaining a deed on Aug. 16, 1916. At the same time the railroad property was acquired by Hurwitz Brothers Iron & Metal Company, Syracuse, N. Y., who operated it until Oct. 16, 1916, after which operations were discontinued because of the failure to secure sufficient subscribers for the organization of a new company to continue the railroad operations. The property has been dismantled and scrapped.

United Railways & Electric Company, Baltimore, Md.—At the meeting of the directors of the United Railways & Electric Company on Jan. 30 M. Ernest Jenkins was elected a member of the executive committee. He takes the place of William A. House, resigned.

Washington Railway & Electric Company, Washington, D. C.—At the recent annual meeting of the Washington Railway & Electric Company Charles A. Spalding, Washington, was elected a director of the company to succeed Oscar L. Gubelman, of Knauth, Nachod & Kuhne, New York, N. Y., bankers, who retired because his other interests prevented him from participating regularly in the deliberations of the board.

Washington & Maryland Railway, Washington, D. C.—The Public Utilities Commission of the District of Columbia has withdrawn the authority granted under its order dated June 30, 1915, authorizing the Washington & Maryland Railway to issue and sell first-mortgage 5 per cent thirty-year gold bonds to the amount of $66,200. It has now authorized the company to issue $66,000, par value, of general mortgage 6 per cent thirty-year gold bonds and $30,000, par value, of prior lien 5½ per cent thirty-year gold bonds. The $66,000, par value, of the general mortgage bonds of the railway will be used to consummate the purchase of the properties of the Baltimore & Washington Transit Company in Maryland in lieu of the $66,200, par value, general mortgage bonds heretofore authorized, including the retiring of the certificates issued by the receiver of the Baltimore & Washington Transit Company of Maryland, amounting to $20,000. The $30,000, par value, of prior lien, 5½ per cent, thirty-year gold bonds will be used as collateral to secure the payment of $25,000 of 6 per cent, one-year gold notes. The $25,000, par value, 6 per cent, one-year gold notes will be sold for cash at par, and the proceeds will be used to extend the road from its present terminus in the town of Takoma Park, Montgomery County, Maryland, and through the town by way of Carroll Avenue to its junction with Sligo Creek. As the gold notes which are to be issued are payable in not more than a year the consent of the commission was not necessary on this point and the commission did not consider it. The commission also approved a contract providing for the operation of the lines of the Washington & Maryland Railway by the Capitol Traction Company.

Dividends Declared

American Railways, Philadelphia, Pa., quarterly, 1¾ per cent, preferred.

Cumberland County Power & Light Company, Portland, Me., quarterly, 1½ per cent, preferred.

Illinois Traction Company, Peoria, Ill., quarterly, three-quarters of 1 per cent, common.

Massachusetts Consolidated Railways, Greenfield, Mass., quarterly, 1⅝ per cent, preferred.

New Hampshire Electric Railways, Haverhill, Mass., 2 per cent.

Philadelphia Company, Pittsburgh, Pa., 2½ per cent, preferred.

Rio de Janeiro Tramway, Light & Power Company, Ltd., Rio de Janeiro, Brazil, 1¼ per cent.

Sao Paulo Tramway, Light & Power Company, Ltd., Sao Paulo, Brazil, 2½ per cent, common.

Union Street Railway, New Bedford, Mass., quarterly, 2 per cent.

United Power & Transportation Company, Camden, N. J., $1.55.

Electric Railway Monthly Earnings

ATLANTIC SHORE RAILWAY, SANFORD, ME.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$21,935	*$33,520	†$11,585	......	......
1 " "	'15	22,658	*20,051	2 607	......	......

CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov.,	'16	$34,904	*$19,084	$15,820	$6,484	$9,336
1 " "	'15	33,011	*17,790	15,221	6,642	8 579
12 " "	'16	389 650	*228,545	161,105	78,312	82,793
12 " "	'15	350,740	*205,580	145,160	79,330	65,830

COLUMBUS (GA.) ELECTRIC COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov.,	'16	$87,021	*$31,903	$55,118	$28,521	$26,597
1 " "	'15	67,290	*27,382	39 908	28,679	11,229
12 " "	'16	867,196	*347,933	519,263	343,726	175,537
12 " "	'15	710,927	*322,776	388,151	344,657	43,494

FEDERAL LIGHT & TRACTION COMPANY, NEW YORK, N. Y.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$230,174	*$133,385	$96,789	$49,795	$46,994
1 " "	'15	229,556	*145,642	83,914	48,493	35,421
12 " "	'16	2 502,142	*1,637,893	864,249	586,046	278,203
12 " "	'15	2,352,015	*1,545,716	806,299	589,342	216,957

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov.,	'16	$61,871	*$47,460	$14 411	$15,246	†$835
1 " "	'15	57,229	*40,667	16,562	15,959	603
12 " "	'16	798,318	*543,474	254,844	188,312	66,532
12 " "	'15	729,994	*473,190	256,804	189,531	67,273

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov.,	'16	$163,929	*$92,228	$71,701	$29,222	$42,479
1 " "	'15	145,691	*89 000	56,691	26,954	29,737
12 " "	'16	1,904,904	*1,149,770	755,134	347,583	407,551
12 " "	'15	1,718,833	*1,043,340	675,493	330,265	345,228

PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov.,	'16	$26,100	*$19,883	$6,217	$7,246	†$1,029
1 " "	'15	25,031	*14,421	10,610	7,476	3,134
12 " "	'16	311,625	*208,633	102,992	86 845	16,147
12 " "	'15	289,671	*179,861	109,810	91,529	18,281

PENSACOLA (FLA.) ELECTRIC COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov.,	'16	$21,151	*$13,698	$7,453	$7,726	†$273
1 " "	'15	23,516	*12,407	11,109	7,051	4,058
12 " "	'16	277,192	*155,688	121,504	91,894	29,610
12 " "	'15	254,213	*146,419	107,794	86,073	21,721

TAMPA (FLA.) ELECTRIC COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov.,	'16	$80,779	*$44,027	$36,752	$4,464	$32,288
1 " "	'15	83,696	*44,565	39,131	4,342	34,789
12 " "	'16	961,411	*526,540	434,871	42,391	382,480
12 " "	'15	980,780	*500,902	479,878	52,424	427,454

*Includes taxes. †Deficit.

Traffic and Transportation

British Steam Fares Up 50 Per Cent

Effort Made to Decrease Passenger Traffic and Allow Carriers to Meet Government Demands—Traffic Thrown on Tramways

The extent to which railroad service in Great Britain has been turned to government use was indicated in an unusual fashion by a recent act of the Board of Trade designed to cut down passenger traffic and thus allow the railroads to cope with government demands. It was announced that on and after Jan. 1, 1917, the railroads in Great Britain should take the following steps: (1) Increase all passenger fares 50 per cent, and (2) refuse to carry baggage exceeding a total weight of 100 lb. per passenger. It was intended that these orders should be applied generally, although certain exceptions would be publicly announced later. In general, however, the increase in fares was not to apply to (*a*) workmen's tickets, (*b*) season tickets, (*c*) traders' tickets and (*d*) zone tickets when an arrangement for the issuance of such tickets was already in operation.

When this increase in fares was first announced, some question was raised as to whether the parliamentary railroad fare of one penny a mile could be increased without special legislation. It was stated, however, that the defense of the realm act provided the Board of Trade with necessary power. Furthermore, it was said that the object of the government in making the increase was not to increase revenue, but solely to reduce passenger traffic in view of the enormous demands which the War Office and the Ministry of Munitions would make next year both in Great Britain and in France. The new order was fully a war measure, and the old fares would be restored after the cessation of hostility. It was officially announced, however, that the public would do well to understand that if the increase in fares and the new restrictions did not produce the desired result, other and more exacting measures would certainly be introduced.

The ordered increase applies in the main only to the steam railroads and not to municipal and other local tramways. The desire not to interfere with purely local transportation rates is evident in the published exception of the Underground Electric Railways of London, Ltd. The fare increase does not apply to this company within these limits: (1) On the District Railway within Aston Town, Putney Bridge and Bow Road; (2) on the Bakerloo, Piccadilly & Hampstead lines of the London Electric Railway; (3) on the Central London Railway; (4) on the City & South London Railway; (5) on the Inner Circle and stations on the Hammersmith & City line, and (6) on the Great Northern & City Railway. Local and through fares between these groups and within the limits stated remain unaltered, but in case of bookings to and from outside points, 50 per cent of the fare is added.

The immediate result of the fare increase on the steam railroads was a withdrawal of service that had an effect upon local tramway systems. The steam railroads largely curtailed their suburban train services and entirely shut down many of the stations in the suburban area. This applied very largely to London, but all other big cities were affected, though not so seriously. Consequently, more traffic is likely to be thrown on tramway services. It is anticipated that the closing of a large number of stations on the London railways will throw a considerable amount of extra traffic upon the London County Council Tramway. As soon as it is known where the extra traffic will fall, the tramways department of the Council will immediately consider the best ways and means of coping with it. It will be a difficult problem in view of the fact that the system is already fully taxed, but it is hoped that some solution may be found by a rearrangement of the service. The Underground Electric Railways have also got the matter under consideration, but no decision has yet been announced.

Jitney Tariffs Demanded

California Railroad Commission Requires Rates and Time Schedules Before March 1

The Railroad Commission of California on Jan. 19 ordered all passenger and freight jitneys and auto buses running on regular schedules over regular routes on public highways between fixed points, not solely within municipalities, to file their rates and time schedules with the commission before March 1, 1917. This order follows the recent decision of the Supreme Court of California that jitneys and auto buses operating under those conditions are subject to the jurisdiction of the commission. The commission has prepared blank forms for these filings of rates and routes, and will furnish them to jitney operators.

At present the status of the Railroad Commission with relation to jitneys, both passenger and freight, is that the commission has jurisdiction over the rates of all such transportation when not conducted solely within municipalities.

It was on the complaint of the Western Association of Short Line Railroads against the Wichita Transportation Company and of the United Railroads, San Francisco, against the Peninsula Rapid Transit Company that the proceeding was brought before the Railroad Commission, which recently resulted in the decision of the Supreme Court of California declaring that these lines were under the Railroad Commission's jurisdiction. The Western Association and the United Railroads asked the Railroad Commission to fix rates and time schedules for these freight and passenger jitneys, but the commission denied that it had jurisdiction over them. The case was taken to the Supreme Court by the complainant railroads, and the court decided that the commission had jurisdiction under the following conditions over both passenger and freight jitneys: (1) As common carriers of passengers or freight; (2) on regular schedules; (3) over regular routes on public highways and between fixed terminals, and not operating solely within the limits of one municipality.

These jitneys were held to be transportation companies under section 22 of Article 12 of the state constitution. The Supreme Court declined to say, however, that these companies were subject to all the provisions of the Public Utilities Act, which, besides giving the Railroad Commission jurisdiction over rates and rules of all public utilities, makes all issues of securities by these utilities subject to the commission, and requires that these companies obtain from the commission a certificate that public convenience and necessity require their operation before beginning business.

Hearing on Inclosed Vestibules

Commission Holds Hearing on Proposed Order to Require Fully Inclosed Vestibules on All Greater New York Cars

At a hearing on Jan. 31 the Public Service Commission of New York, First District, submitted its case in regard to a proposed order requiring fully-inclosed vestibules on all cars operated in Greater New York. At the opening of the hearing C. W. Wilder, electrical engineer for the commission, read a report outlining the results to be expected from the use of folding doors and steps in connection with door-interlocked control, citing the fact that the Third Avenue system had reduced the number of its boarding and alighting accidents by about 70 per cent by this means and had eliminated all serious accidents of this class. He quoted from a table published in the ELECTRIC RAILWAY JOURNAL for Feb. 6, 1915, in which it was shown that, on the Third Avenue Railway, the settlements for boarding accidents had been reduced from $6,817 to $451 during four months' test periods in successive years before and after installation of folding doors and steps, and that alighting accident settlements had been reduced from $5,667 to $1,110, these savings applying to about 210 cars.

Mr. Wilder regarded the change as a very profitable one for the railways from a purely financial standpoint, and said that the cost per car should range from $150 to $600 depending upon the amount of reconstruction that was necessary. With regard to the effect on schedule speed he stated that, with the door and control interlock, no appreciable difference need be expected. He did not recommend, however, a device to hold the door closed while the car was in motion, but only one that prevented power from being applied when the door was open.

Objection to the use of the interlock was raised by the railway's representatives on various grounds, including the fact that the device did not eliminate the human element in connection with alighting accidents. The commission, however, pointed out that boarding accidents appeared to be about twice as frequent as alighting accidents and that the serious alighting accidents had been eliminated by the use of folding doors on the Third Avenue System.

Emphasis was laid upon the fact, also, that the electric interlock was a patented device, although the commissioners treated this phase of the matter as of secondary importance by citing the general use of the patented air brake. However, the commission expressed evidence of being willing to accept equivalent devices, such as a mechanical means for holding the controller in off position. Other than this, attention centered throughout the questioning of Mr. Wilder on the matter of cost in relation to the possible saving in damage claims, and the fact was brought out that on one very small property in Greater New York no boarding and alighting accidents had occurred in ten years.

E. A. Maher, Jr., assistant general manager of the Third Avenue Railway, testified that all of that company's cars had been equipped with fully-inclosed vestibules since 1914, and that it was unquestionably a desirable arrangement. The interlock, he said, added about $100 to the cost of the change-over for each car, but that no royalty was paid to the patentee of the device, J. S. MacWhirter, superintendent of equipment, Third Avenue Railway. The total cost of material and labor for installing folding doors and steps and a control interlock amounted to $324 per car in 1913-14. At present prices the cost would be about 70 per cent greater.

No case was put forward by the railways at this hearing and more time was requested to permit them to investigate the subject. The hearing was therefore adjourned to Feb. 28.

Goods Traffic Recommended

Larger Electric Railway Freight Service Recommended by Massachusetts Cost of Living Commission

The extension of electric railway freight and express service at Boston and the development of comprehensive plans and the construction of appropriate facilities for the larger treatment of the merchandise transportation problem by the Boston Transit Commission is recommended in a special report to Governor McCall of Massachusetts by a special commission on the high cost of living, headed by former Lieut.-Gov. Robert Luce. In the course of its discussion the report emphasizes the admirable development of passenger transportation facilities at Boston in the last twenty-five years through the construction of subways by the commission and urges that the board now be required to devote its experience and abilities to the solution of the merchandise-handling problem. The report declares that electric railway freight has been neglected by the community as a factor in reducing the present high cost of living, points out that the existing electric railway express development is insufficient for the possible traffic available, and recommends that the details of electric freight service with the exception of terminal construction be placed under the supervision of the Public Service Commission. The report also advises legislation giving the latter commission power to authorize and foster, with due regard for public convenience, the carriage on electric railways of any and every form of merchandise and material.

Economy in Supplies Urged

Samuel Rea, president of the Pennsylvania Railroad, on Jan. 29 sent a notice to all officers and employees of the company calling attention to the fact that the strictest economy must be adhered to in the ordering and use of material. Mr. Rea's notice was as follows:

"I desire to call your attention to the exceptionally high prices of all classes of materials and supplies. This increase in cost, in many cases exceeding 100 per cent and in some cases 200 per cent or higher, is becoming more serious for the company, and is one of the main causes for its decreased net earnings despite greater gross earnings. Therefore, in the interest of all concerned, it is essential to practise the strictest economy in ordering and using materials and supplies. Officers will bring this notice to the attention of all employees, and request their co-operation in all measures required to make it effective."

Jitney Regulations in Vancouver

The by-law embodying the changes in rules and regulations of jitney buses in Vancouver, B. C., has been passed by the Council after several months' delay. The only change made in the new ordinance on final reading was in the clause providing for the routing of jitneys. The routes finally decided upon are, with one exception, the same as those taken by the street cars. The new ordinance includes provisions that no person under twenty-one years of age shall operate a jitney; that all applicants must undergo a medical examination; that every owner of any motor vehicle must report to the license inspector once a month a record of all drivers in his employ; that only one passenger be allowed in the front seat; that cars must stop 75 ft. from a corner to load or unload passengers; that drivers must state the route over which they intend to operate when they secure license and must complete full trip; that lights must be kept burning in the rear seat of each car from dusk until dawn when the top is up; that the license fee per car shall be $30 and the driver's license $5 per annum. Representatives of the British Columbia Electric Railway and the Jitney League were present at the final hearing. W. G. Murrin, assistant general manager, spoke for the railway.

New Public Service Magazine

A new monthly employees' publication, the *Trolley Weal*, has just been launched into print by the Public Service Railway, Newark, N. J. The first issue, dated Januuary, 1917, is prefaced by forewords of encouragement by President Thomas N. McCarter and General Superintendent N. W. Bolen, expressing sympathy with the plan of starting the new magazine. The editor, J. W. Brown, assistant general superintendent of the company, is assisted by eight associate editors. The editorial plan, as announced in the columns of the new paper, provides for the publication from time to time of articles by the several department heads dealing with some special feature of operation, engineering, maintenance, accounting, or whatever the subject may be. In addition, every man is urged to contribute articles dealing with his experience in whatever duties he is engaged on the property, also to turn in items of personal and social nature of events in the athletic field and other general news. The periodical will in later issues keep its readers posted on technical literature by giving short reviews of new books received by the company's technical library and calling attention to the important articles in current periodicals. The magazine carries no advertising matter.

Ticket Sales on Cars Discontinued

The sale of interurban tickets on cars on the Akron, Bedford & Cleveland and Canton-Akron divisions of the Northern Ohio Traction & Light Company, Akron, Ohio, have been discontinued. According to the company it has been found that conductors were very often unable to supply tickets to all who requested them without being required to carry an excessive and impracticable number of tickets on the cars; and these tickets sold on cars could not be accurately stamped as to dates and place excepting only from the offices where conductors obtained supplies. As a result, the record of the date of the ticket might be all wrong by the time the ticket reached the passenger.

In the second place, the sale of tickets on the cars has been a great handicap to conductors for the reason that bills of large denomination are constantly presented for change, and errors are much more likely to be made while the conductor is receiving fares on a well-filled car than will often happen at a ticket office window.

With less attention and time required in taking fares and making change, conductors will be the better able to care for the safety of their passengers and cars.

Meeting of Missouri Short Line Committee.—In a report of the meeting of the Missouri Short Line Safety Committee, published in the ELECTRIC RAILWAY JOURNAL of Jan. 6, page 32, the safety organization of the Kansas City, Clay County & St. Joseph Railway, the name of J. D. Bowersock was erroneously given. The speaker on that occasion was I. D. Hook, attorney for the road.

Louisville Publication Reiterates Responsibility of Employee.—*Trolley Topics*, the company publication of the Louisville (Ky.) Railway, has helped to perpetuate one phase of the doctrine of publicity by quoting in its columns the text of an editorial which appeared in the ELECTRIC RAILWAY JOURNAL of Nov. 4, 1916, headed by a cartoon entitled "Every Employee a Publicity Representative."

Kentucky Court Condemns Accident Running.—Efforts of the Louisville (Ky.) Railway to discourage the practice of certain attorneys soliciting damage cases against the company, have been in the main sustained by decisions of the Kentucky courts. In a recent case the Kentucky Court of Appeals ruled that the attorney may not collect a $500 contingent fee from the railway company because his employment as attorney was secured by illegal solicitation and was against public policy. The opinion of the court distinguished between personal solicitation and the "indefensible and vicious practice of employing agents and runners to go about the country soliciting business and stirring up strife and securing litigation for a stipulated compensation or a contingent fee."

Sedalia Company Describes Its Problems.—The City Light & Traction Company, Sedalia, Mo., a Doherty property, has embodied a series of its Sedalia illustrated newspaper advertisements into a booklet of facts just issued about the operating, management and personnel of the company. Each advertisement is devoted to a certain phase of operation, well calculated to interest the reader, such as the modern equipment of the Sedalia cars and their safety devices; the power house and the auxiliary units which must be maintained in order to prevent interruption of service; the company's office and the hospitality it offers; the platform men and the extent of their work; the cost of trolley wire, track and car repairs, and the economy of going to work in trolley cars as compared with automobiles.

"The Missouri Short Line."—"The Missouri Short Line" is the familiar title that has crept into popular usage for the Kansas City, Clay County & St. Joseph Railway operating between Kansas City and St. Joseph, Mo., and between Kansas City and Excelsior Springs. The Kansas City public had referred to the "Excelsior Springs Route" when reference was meant to that division, and to the "St. Joseph Line" when the other division was intended. Speaking casually of the Kansas City, Clay County & St. Joseph Railway, the abbreviation used was "Clay County Road." This designation omitted entirely Kansas City, St. Joseph, Excelsior Springs, Jackson County, Mo., Buchanan County and Platte County. To obviate any unintended partiality, the name "Missouri Short Line" was decided upon.

Kentucky Pass Rulings.—First rulings in the Kentucky courts relating to rights of pass-holders and obligations of railways, under the new anti-pass law in effect in Kentucky, have favored the pass-holders. Two plaintiffs sued to compel the Kentucky Traction & Terminal Company to continue honoring passes issued to them in consideration of their giving rights-of-way to the company. The plaintiffs contended that the Federal constitution provided against passage of laws such as to abrogate contracts. When the Kentucky law became effective, the company, and others in the State, notified the holders of perpetual as well as other passes that they would no longer be honored. The railway is seeking merely an interpretation of the law in such cases and will appeal from the decision, although it has no desire to evade its contract.

Four Killed in an Accident in Ohio.—On the afternoon of Jan. 27 a head-on collision occurred between a freight and a passenger car on the Cleveland, Southwestern & Columbus Railway, near Strongsville, Ohio, which resulted in the death of four persons and the injury of a number of others. Clarence T. Kemerer, motorman of the passenger car, and Orr H. Dawson, chief electrician of the road, were among the dead. The cars took fire after the collision and were destroyed. A second wreck occurred on the Cleveland, Southwestern & Columbus Railway, 3 miles north of Wooster, on Jan. 29, William Gauweiler, motorman on a passenger car, running extra and without passengers, was killed. The car struck a work train. One or two other employees of the company were injured. The car took fire and was totally destroyed.

Massachusetts Commission Publishes Inspection Figures.—During the year the inspection department of the Massachusetts Public Service Commission, according to its 1916 report, made 4040 car inspections and found defects in 918 cases, including untidy conditions. The number of fatal accidents to individuals investigated was 105. The number of accidents due to broken or loose wheels, broken journals and axles reported was 115; miscellaneous accidents investigated, such as collisions, personal injuries and accidents caused by faulty operation, 592; accidents caused by spread rails, broken rails, defective special work, poor surface and alignment of track, 746. Accidents caused by persons coming in contact with either fenders or wheel guards or both were: fatal, 24; serious, 15; either fatal nor serious, 280. Lifting jacks were used eight times to extricate persons from under cars, the time ranging from 3 to 15 minutes, usually under 5 minutes.

Jitney Franchises Sought in Portland, Ore.—Franchises for the operation of several jitney lines over various streets in Portland, Ore., sought by Stephen Carver are being published by the City Council. A provision was inserted in the proposed franchises requiring Carver to provide a bond of $1,000 for each of the two proposed East Side grants, and a bond of $500 covering the proposed West Side grants, as a guarantee that within thirty days after the franchises become effective, he will begin to operate motor buses over the various designated routes, and will continue to operate them for at least six months thereafter. Additional bonds of $10,000 for each of the two East Side grants and $7,500 for the West Side franchise will be required to cover any damages resulting from accidents to patrons of the various lines. Vice-President F. I. Fuller and Attorney R. A. Leiter, of the Portland Railway, Light & Power Company, objected to the routing of the jitneys on any streets on which street cars of the company operate, because of the danger and from the standpoint of fairness to the company. The charge which will be made against the jitney operators under the proposed franchises is a quarterly fee of $1 for each seat in the jitney.

New York's Annual Fares Almost 2,000,000,000.—For all the transit lines in Greater New York during 1916 there was an increase in passengers carried over 1915 of 91,000,000, according to the recent annual report of the Public Service Commission of the First District of New York. The number of fares collected during the year ended June 30, 1916, was 1,898,735,615, against 1,807,632,726 for the preceding year. The amount of fares collected during 1916 was $93,176,216, an increase of more than $4,000,000, or nearly 5 per cent over 1915. The payment of transportation on these lines during 1916 was $17.80 per capita. During the year the Interborough Rapid Transit Company carried a total of 371,505,312, an increase of 25.919,569 over the previous year. During the latter part of 1916 the subway not infrequently carried an average of more than 1,400,000 passengers a day. In conclusion the report points out that the 1916 record for accidents on railroads and street railroads in New York City exceeded that for 1915 by more than 5000. In 1915 the total number of accidents was 66,208, and last year the total was 71,854. The number of persons killed in such accidents in 1915 was 231, against 251 in 1916.

Personal Mention

Fred M. Weld has been appointed master mechanic of the Holyoke (Mass.) Street Railway.

G. C. Chadderdon has been appointed chief engineer of power station of the Springfield (Ohio) Railway.

J. J. Molyneaux has been appointed auditor for the Southwestern utility properties of H. M. Byllesby & Company, Chicago, Ill.

A. H. S. Cantlen has been elected president of the Quakertown (Pa.) Traction Company, a subsidiary of the Lehigh Valley Transit Company.

James H. Porter, superintendent of distribution of the Oskaloosa Traction & Light Company, Oskaloosa, Iowa, has been appointed general superintendent of this company.

Max H. Prill, vice-president of the Centralia & Central City Traction Company, Centralia, Ill., has been appointed general manager, succeeding his father, Max Prill, who remains as president.

George W. Davison, one of the vice-presidents of the Central Trust Company, New York, has been elected a director of the Third Avenue Railway, New York, succeeding the late Frederick W. Whitridge.

Martin Delehanty, foreman of the Cold Spring carhouse of the International Railway, Buffalo, N. Y., has been promoted to the position of assistant general carhouse foreman in charge of car cleaning and sanitation.

R. J. McElravy, for the past three years superintendent of the East Liverpool Traction & Light Company, has been appointed general manager, succeeding C. A. Smith, who will continue as president of the company.

A. E. Ward, who has been affiliated with the Reading Transit & Light Company in Reading, Pa., has been appointed as manager of the Lebanon properties of this same company, to succeed Harry G. Louser, resigned.

R. S. Metzger, of the Toledo Railways & Light Company, Toledo, Ohio, has been added to the force of the safety department of Henry L. Doherty & Company, having charge of all safety matters pertaining to railway work.

R. J. Hole, who has been local manager of the Salisbury & Spencer Railway, Salisbury, N. C., has become manager in charge of operations in all divisions of the North Carolina Public Service Company, and will move to Greensboro.

R. P. Stevens, president of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, was elected a member of the board of directors of the Cleveland Electric Illuminating Company at the annual meeting on Jan. 24.

Paul S. Duenweg, assistant manager of the Galveston (Tex.) Electric Company, has been promoted to the position of secretary to L. C. Bradley, district manager of the Stone & Webster properties in Texas, with headquarters in Houston.

C. S. Pinkerton, formerly associated with the Guaranty Trust Company, New York, as assistant auditor, has been elected treasurer of J. G. White & Company, Inc., and the J. G. White Engineering Corporation, of New York, succeeding R. B. Marchant.

Frederick L. Ray, who has resigned as superintendent of steam equipment for the Louisville (Ky.) Railway, was guest of honor at a banquet given by Kentucky No. 1, National Association of Stationary Engineers. There were forty men present and farewell addresses were made.

Douglas I. McKay has been elected a vice-president of J. G. White & Company, Inc., New York. Mr. McKay, who at one time was Police Commissioner of New York City, has been connected with J. G. White & Company, Inc., for more than two years in the capacity of assistant to the president.

G. C. Still, chief engineer of the Cumberland County Power & Light Company, Portland, Me., and the York County Power Company, has also been appointed chief engineer of the Lewiston, Augusta & Waterville Street Railway and the Westbrook Electric Company, which are controlled by the Cumberland County Power & Light Company.

Sanger B. Steel has been elected a vice-president of J. G. White & Company, Inc., New York. Mr. Steel, prior to his recent election, was manager of the Chicago office of the banking and brokerage firm of Paine, Webber & Company, Boston, and his activities with the White corporation will be in connection with handling and distributing securities.

Clinton B. Smith has been made superintendent of schedules and time-tables of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. Mr. Smith is a graduate of Worcester Polytechnic Institute. He completed the cadet course with the Public Service Railway of New Jersey and was with that company for some time as a traffic investigator.

G. L. Enfors, who has been superintendent of the repair shops and the railroad division of the Porto Rico Railway, Light & Power Company, Ponce, P. R., for four years, has been promoted to also take charge of the trolley division of this company, with the title of superintendent, succeeding J. E. Burns, resigned. Mr. Enfors previously was connected with the Boston (Mass.) Elevated Railway in the engineering department for seven years and for twelve years was connected with the Fitchburg & Leominster Street Railway, Fitchburg, Mass., as superintendent of motive power.

R. O. Launey has been appointed editor of the *Buzzer*, the employees' weekly magazine of the Birmingham Railway, Light & Power Company, Birmingham, Ala., to succeed Frank Hammond, resigned. Mr. Launey has shown a great interest in the publication of this magazine, and has been a large factor in its success. He has been with the company since April, 1904, and holds the position of auditor. He has taken an active part in athletic and welfare work. Before becoming affiliated with the above mentioned company Mr. Launey was connected with the public utilities at Savannah, Ga., where he was born.

C. R. Collins, assistant engineer in the engineering department of the Puget Sound Traction, Light & Power Company, Seattle, Wash., has left this company to go with the Grays Harbor Railway & Light Company, Aberdeen, Wash., where he will assume the position of general superintendent and chief engineer. Mr. Collins is a graduate of Purdue University of the class of 1907. Since 1909 he has been connected with the Puget Sound Traction, Light & Power Company, being successively in the substation, meter, distribution and operating departments, and holding the positions of superintendent of distribution, operating superintendent in charge of meters and distribution.

S. T. Henry has resigned as second vice-president of the McGraw Publishing Company, Inc., and on Feb. 1 became identified with the American International Corporation, New York, as vice-president of a subsidiary organization which will handle the export of contractors' machinery and equipment. In his comparatively brief career with the McGraw Publishing Company Mr. Henry has made remarkable progress. Entering the organization, after graduation from the University of Illinois, in August, 1904, as an assistant on the editorial staff of the *Engineering Record*, he rose rapidly through the positions of Western editor, Cleveland advertising representative, and Western manager of the paper to the junior vice-presidency of the company. Since his promotion to a general executive position his duties have pertained to all the properties of the company, including, in addition to the *Engineering Record*, the *Electrical World*, the ELECTRIC RAILWAY JOURNAL, and *Metallurgical & Chemical Engineering* and *Electrical Merchandising.*

J. W. Brown, since 1913 assistant general superintendent of the Public Service Railway, Newark, N. J., is the editor of the new employees' publication of that company, the *Trolley Weal*, described elsewhere in this issue. Mr. Brown has been connected with the Public Service Railway since April, 1911. Before that he was with the Aurora, Elgin & Chicago Railroad and prior to that time was superintendent of transportation of the West Penn Railways, Connellsville, Pa. He entered the service of the McKeesport, Wilmerding & Duquesne Railway, McKeesport, Pa., about fourteen years ago as night car dispatcher. He also served as electrician and later as power station engineer of this company. When the Pittsburgh, McKeesport & Connellsville Railway was formed, Mr. Brown was made master mechanic of the McKeesport Division of that road and later was promoted to division superintendent. When the transportation department of the company was organized in 1903 he was appointed superintendent of transportation of the company. He resigned from the West Penn Railways in August, 1910, to become connected with the Aurora, Elgin & Chicago Railroad. Previous to his present operating position on the Public Service Railway, Mr. Brown was assistant superintendent of transportation.

Edward A. Maher, Sr., vice-president and general manager of the Third Avenue Railway and its subsidiary companies, has been elected president of the company to succeed the late Frederick W. Whitridge. Mr. Maher was born in Albany, N. Y., in 1852. He attended the public school and after graduation from the State Normal School entered politics, was successively president of the Board of Supervisors of Albany and a member of the Assembly from that city. He served as Mayor of Albany from 1888 to 1890. Upon expiration of his term he was made vice-president and general manager of the Albany Electric Illuminating Company. Mr. Maher came to New York City in 1892 and was made president of the Union Railway. In 1896 the Third Avenue Railway took over the Union Railway properties and Mr. Maher retained his position as president and general manager of the Bronx and Westchester subsidiary company. When Mr. Whitridge was elected receiver of the Third Avenue Railway in 1908, Mr. Maher was made general manager. Later when the receivership was lifted and Mr. Whitridge was elected its president, Mr. Maher was made vice-president and general manager of the line, which positions he held until his recent election. He had direct charge of meeting the strike situation which began in Yonkers last summer and later extended to the entire Third Avenue System.

Obituary

Orr H. Dawson, chief electrician of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, was killed in a collision on Jan. 27 between two cars on the company's line.

Robert E. Sheldon, who served for more than thirty years as a director of the Columbus Railway, Power & Light Company, Columbus, Ohio, and a portion of that time as vice-president and as president, died at his home in that city on Jan. 20. Mr. Sheldon resigned his position as president of the company in 1912.

John P. Dwyer, auditor of disbursements for the Boston (Mass.) Elevated Railway, died on Jan. 28 at his home in Newton as a result of shock from his wife's recent death. Born in Saratoga Springs, N. Y., sixty-two years ago, Mr. Dwyer came to Boston and as a boy took employment with the old West End Street Railway. He worked up to the office which he held at the time of his death. He is survived by a son, a daughter and a sister.

A. A. Thurlby, superintendent of transmission for the Chicago Surface Lines, died on Jan. 23. Mr. Thurlby was born in Nottingham, England, in 1860, and came to America in 1868. He began work with the Brush Electric Company, Cleveland, Ohio, where he became an erecting engineer. In 1891 he resigned that position to become manager of the Battle Creek (Mich.) Street Railway. The following year he accepted the position of engineer for inside wireman with the Chicago Edison Company. In 1893 he accepted a position with the People's Light, Power & Motor Company, Chicago, as assistant superintendent in charge of overhead lines. He remained with that company when it was absorbed by the Commonwealth Edison Company, but resigned in 1899 to accept the position of manager of the Manistee (Mich.) Electric Railway. In 1902 he became associated with John R. Walsh in his electrical projects, but resigned in 1907 to return to the Commonwealth Edison Company. In 1907 Mr. Thurlby was appointed superintendent of underground and overhead wires and cables of the Chicago City Railway, which position he held until his appointment with the Chicago Surface Lines in 1914.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Stanley Railway Company of New Britain, New Britain, Conn.**—Application for incorporation has been made by the Stanley Railway Company of New Britain to construct a line between New Britain and Hartford. Capital stock, $100,000, with power to increase it to $300,000. Incorporators: Mayor George A. Quigley, Senator George M. Landers, James M. Curtin and E. O. Kilbourne, New Britain, and John A. Pilgard, Hartford.

***Franklin County Traction Company, Benton, Ill.**—Incorporated to construct an electric railway from North City to Benton via Christopher. Capital stock, $50,000. Incorporators: C. W. Gardner, Christopher; E. B. Gardner and F. B. Buchanan, West Frankfort, and C. C. Baldwin, Centralia.

Sapulpa (Okla.) Electric Interurban Railway.—Incorporated in the State of Oklahoma as a successor to the Sapulpa & Interurban Railway, operating between Sapulpa, Kiefer and Glen Pool, 12 miles, and bought in under foreclosure by the bondholders on Sept. 9, 1916. Capital stock, $200,000.

***Hampton & Langley Field Railway, Hampton, Va.**—Incorporated to construct a line from Hampton to the Langley aviation field, 4 miles. The line will connect with the Newport News & Hampton Railway, Gas & Electric Company. The promoters of the road are the principal owners of the Newport News & Hampton Railway, Gas & Electric Company, but the new company will maintain a separate corporate identity. Officers: J. N. Shannahan, president; F. W. Darling, vice-president, and H. R. Booker, secretary-treasurer.

FRANCHISES

Los Angeles, Cal.—The Pacific Electric Railway has asked the City Council for a fifty-year franchise to operate the proposed subway route from the Fourth Street station to Vineyard.

Waukegan, Ill.—The recent franchise submitted by the Chicago, North Shore & Milwaukee Electric Railroad has been accepted by the city of Waukegan.

Tipton, Ind.—The Tipton-Frankfort Traction Company will ask the City Council for a franchise to construct a line in Tipton. R. D. Wynn, Tipton, is reported interested. [Dec. 30, '16.]

Takoma Park, Md.—The Council of Takoma Park has voted to grant a franchise to the Washington & Maryland Railway to construct an extension from the district line, the present terminus of the line to the bridge across Sligo Creek. It is understood that upon completion of the line it will be leased to the Capital Traction Company.

Lawrence, Mass.—The Bay State Street Railway has received a franchise from the City Council of Lawrence to construct a line on Water Street from Ames Street to the Methuen line.

Worcester, Mass.—Mayor Pehr G. Homes has signed the franchise recently passed by the Board of Aldermen granting the Worcester Consolidated Street Railway permission to extend its tracks on Greenwood Street to the city line.

Milan, Ohio.—The Lake Shore Electric Railway has asked the City Council of Milan for a new twenty-five year franchise.

Maryville, Tenn.—An election will be held on Feb. 24 on the proposition to grant a franchise to the Knoxville Railway & Light Company to construct a line in Maryville. The company proposes to construct a line from Maryville to Knoxville.

Waterford, Wis.—The Milwaukee Electric Railway & Light Company has received a franchise from the City Council to furnish electric service in Waterford.

TRACK AND ROADWAY

Visalia Electric Railroad, Exeter, Cal.—The options on various strips of land through orange groves held by the Visalia Electric Railroad for the proposed route into Lindsay from a point 1 mile east of the city has expired, but an extension was granted by the owners until such time as the Railroad Commission passes on the objection raised by the Santa Fé Railroad in opposition to the electric road crossing its yards.

Martinez & Concord Interurban Railway, Martinez, Cal.—At a recent meeting held in Martinez, details of the proposition for building the Martinez & Concord Interurban Railway were discussed. It is proposed to build the road at a cost of $159,499 and to issue bonds in this amount, $90,000 to be subscribed by property owners along the route and people of Martinez who are to pay 30 per cent of their subscription when the road is built and in actual operation and the remaining 70 per cent within twenty years. It is proposed to issue twenty-five-year 6 per cent first mortgage bonds in the sum of $125,000 to sell at not less than 90 and $60,000 par value of the capital stock to sell at not less than 80. The road will be built through Martinez under the franchises heretofore granted, out the Pacheco Road to near the McMahon ranch, thence eastward to a connection with the Santa Fé Railroad near Avon and the Cowell Road and the Oakland, Antioch and Eastern Railroad at the Government Ranch. Clifford McClellan, San Francisco, is interested. [Sept. 30, '16.]

Denver (Col.) Tramway.—This company will construct a loop from the foot of Seventeenth Street in front of the Union Station,

Connecticut Company, New Haven, Conn.—The Public Utilities Commission of Connecticut has ordered the Connecticut Company to extend its line on Dixwell Avenue, Hamden, to a connection with its line into New Haven via Whitney Avenue.

Wilmington & Philadelphia Traction Company, Wilmington, Del.—This company will construct an extension on Mable Street from Vandever Avenue to its power plant.

West Coast Electric Railway, Sarasota, Fla.—It is reported that Hiram McElroy, Tampa, is making surveys for this company's proposed line from Tampa to Bradentown and Sarasota, about 50 miles. A. E. Townsend, Sarasota, general manager. [Sept. 16, '16.]

Atlanta & Anderson Electric Railway, Atlanta, Ga.—The route of the proposed Atlanta & Anderson Electric Railway has been decided upon and surveys have been begun. The line will connect with the Piedmont & Northern Electric Railway at Anderson. The road will cross the Savannah River at a point near Brown's Ferry. J. L. Murphy, Atlanta, is interested. [Dec. 16, '16.]

Chicago, Milwaukee & St. Paul Railroad, Chicago, Ill.—As noted more in detail elsewhere in this issue the Chicago, Milwaukee & St. Paul Railroad proposes to equip 220 miles of its railroad in the State of Washington for electrical operation.

Chicago, North Shore & Milwaukee Electric Railroad, Highwood, Ill.—This company will make some extensive repairs to its track on County Street, Waukegan.

Murphysboro Electric Railway, Light, Heat & Power Company, Murphysboro, Ill.—Work has been begun by this company on its extension to Carbondale and it is expected that operation will be begun by June.

Kankakee & Urbana Traction Company, Urbana, Ill.—This company is now securing franchises, permits, etc., preparatory to building an extension from Paxton to Gilman next spring.

Aurora, Elgin & Chicago Railroad, Wheaton, Ill.—Following a disagreement over franchise matters, the Aurora, Elgin & Chicago Railroad has ceased to operate cars through the city of Batavia. Cars operate now only to the city limits.

Interstate Public Service Company, Indianapolis, Ind.—This company will lay new 90-lb. rails on Washington and Third Streets, Columbus, preparatory to new paving. The track will be laid on creosoted ties embedded in concrete.

Vincennes (Ind.) Traction Company.—This company will build a baseball park near Lakewood, adjacent to Vincennes.

Wichita Railroad & Light Company, Wichita, Kan.—This company will extend its College Hill line from Roosevelt Avenue to East Street. The company is now in the market for rails for the line. It is estimated that the extension will cost about $50,000.

Orleans-Kenner Electric Railway, New Orleans, La.—A report from the Orleans-Kenner Electric Railway states that it will construct a line between Kenner and Destrehan, 6 miles.

United Railways & Electric Company, Baltimore, Md.—The new Hanover Street bridge over the Patapsco River has been completed and operation over the structure has been begun by the United Railways & Electric Company. The cost of the bridge and its approaches was $1,250,000, $150,000 of which was paid by the United Railways & Electric Company.

***Ocean City, Md.**—The Isle of Wight Land Company, Ocean City, is reported to be in the market for about 10 miles of relaying rails, 60 to 70 lb. per yard. C. Edward Shute, secretary.

Boston (Mass.) Elevated Railway.—In response to an order made by the Legislature last year, the Massachusetts Public Service Commission has sent to the Legislature a report embracing plans for extensive changes in the structure of the elevated railway on Atlantic Avenue so as to accommodate freight traffic for a short distance. It is estimated that the proposed changes would cost about $3,000,000.

Kansas City (Mo.) Railways.—This company reports that it expects to build 8 or 10 miles of new track during 1917.

United Railways, St. Louis, Mo.—Although no formal application has been made for the change, it is said that the route of the Hamilton line of the United Railways may be extended to connect it with the Market Street line. This will make it a crosstown line, extending from the Wellston loop to the Market Street line south of Forest Park. This would afford to residents of several thickly populated subdivisions and suburbs west and southwest of Forest Park an outlet with transfer privileges to east and west lines.

Chautauqua Traction Company, Jamestown, N. Y.—The Julian-Beggs Signal Company, Terre Haute, Ind., has received a contract to install signal and speed control appliances on the lines of the Chautauqua Traction Company and the Jamestown, Westfield & Northwestern Railroad. It is estimated that the cost of the installation on the two roads will be about $250,000.

Cleveland (Ohio) Railway.—A report from the Cleveland Railway states that it expects to construct 10 miles of new track during 1917.

Scioto Valley Traction Company, Columbus, Ohio.—The Scioto Valley Traction Company, in order to secure an independent entrance into the city of Columbus, has leased from the State the bed of the old canal feeder from the Lockbourne road to Main Street, 11 miles. The period of the lease is twenty-five years and the rental $6,000 per year. The bridge over the Hocking Valley Railway and the grade crossing over the Norfolk & Western Railroad, south of the city, will be eliminated. The cars will be operated from the intersection with Main Street over that thoroughfare to the proposed new union station.

Portland & Oregon City Railway, Portland, Ore.—The completion of the Portland & Oregon City Railroad between Portland and Highland at an early date was forecasted recently when representatives of the Security Savings & Trust Company, Portland, made arrangements to file a trust deed necessary to the issuance of $350,000 in bonds, money derived from the sale of same to be used in early construction. The company, which operates 15 miles of line between Portland and Bakers Bridge on the Clackamas River, plans ultimately to build a branch from Dedman Station to Oregon City. Ballasting of the 15 miles of track under operation and the construction of the line from Bakers Bridge to Highland, about 8 miles, will begin in the spring, according to present plans.

Denver & Ephrata Street Railway, Denver, Pa.—The directors of the Conestoga Traction Company have authorized the lease on completion of the Denver & Ephrata Street Railway, recently incorporated to construct a line between Denver and Ephrata, about 4 miles. [Dec. 2, '16.]

***Hershey, Pa.**—It is reported that plans are being considered for the construction of an electric railway for passenger and freight between Hershey and Reading, via Jonestown, Fredericksburg, Bethel, Rehrersburg, Strausstown, Bernville, Mt. Pleasant, etc., and that application for a charter will be made before April 1.

Philadelphia, Pa.—The installation of a trackless trolley to serve the Byberry section has been recommended by M. J. Ryan, Public Service Commissioner, in connection with plans for the extension of the Frankford elevated line to this point.

Sioux Falls (S. D.) Traction System.—This company reports that it will probably construct 2 miles of new track during 1917.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—Plans are being made by the Puget Sound Traction, Light & Power Company to construct a plate-girder bridge over Lake Washington Canal at Latona.

Seattle & Rainier Valley Railway, Seattle, Wash.—This company reports that it will construct a 1-mile branch line and will reroute approximately 1 mile of its present main line.

SHOPS AND BUILDINGS

Kankakee & Urbana Traction Company, Urbana, Ill.—This company has acquired a lot in Ludlow as a future station site.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me.—This company has purchased a large tract of ground in the rear of its carhouse on Lower Lisbon Street and plans to construct a new paint shop.

Worcester (Mass.) Consolidated Street Railway.—This company will construct a freight station on Shrewsbury Street, adjoining Boulevard Park.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—A new passenger station will be built by the Buffalo & Lake Erie Traction Company in Irving.

Southern Traction Company, Dallas, Tex.—This company plans to construct a new interurban passenger and freight station in Waco.

POWER HOUSES AND SUBSTATIONS

Iowa Railway & Light Company, Cedar Rapids, Iowa.—This company is constructing a new power plant in Perry, the buildings being practically completed. The company is extending its service in the vicinity of Perry, and the new plant will be used to supply the demand for energy.

Centerville Light & Traction Company, Centerville, Iowa.—This company will install in its powerhouse one 2500-kw. turbine and condenser, one cooling pond and two 500-hp. boilers, and will build one stack. The company will also erect 30 miles of 33,000-volt transmission line.

Kentucky Traction & Terminal Company, Lexington, Ky.—This company has begun the installation of a new steam boiler and a 4000-kw. generator at its power house in Lexington.

Hagerstown & Frederick Railway, Frederick, Md.—A contract has been let by the Hagerstown & Frederick Railway for the installation of a 9000-hp. steam turbine-driven electric generator with auxiliaries as an addition to the power output of the company's plant at Security, which, when completed, will give the power station at Security a capacity of 15,000 hp.

Great Northern Railroad, St. Paul, Minn.—The Great Northern Railroad plans to construct a 120,000-hp. plant at Lake Chelan which will generate energy for electrifying the Cascade division. The proposed plant will cost about $5,000,000.

Interborough Rapid Transit Company, New York, N. Y.—This company has acquired property on East Fifty-seventh Street between Third and Lexington Avenues for the purpose of erecting a transformer station to distribute electric current for the operation of trains in the new Lexington Avenue subway and other lines which the company operates. Plans are being prepared by the company for the construction of a substation at 150 West Sixteenth Street, to cost about $40,000.

Manufactures and Markets

Discussions of Industrial Conditions
A Department for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Business Announcements Trade Literature

Good Year for Coasting Recorders and Accessories Predicted

Many Orders Reported—Deliveries Slow—Material Problems Complex—Production for Next Six Months Contracted For—Progress Being Made

According to C. C. Chappelle, vice-president and consulting engineer of the Railway Improvement Company, New York, indications point to a large volume of business in the sale of coasting recorders, terminal clocks, sanitary straps, anti-climbers, etc., for the coming year, even exceeding that of last year, which from the viewpoint of many manufacturers of railway accessories was the most prosperous year for more than a decade. Inquiries were fairly active during the early summer months of last year, but since that time the market has picked up considerably and a number of large orders have been placed. At the present time this company has orders on hand that will absorb in excess of 50 per cent of the 1917 production, and prospective orders pending indicate the company's production will be taxed throughout the year.

MATERIAL PROBLEMS COMPLEX

The coasting recorder, which forms the greatest volume of this company's product, is an assembled machine consisting of a clock mechanism recording device, with its electrical relay for connection with the car wiring.

During the middle of last year the factory had a considerable stock of material such as steel, sheet brass and copper wire, but the scarcity of skilled labor at that time was a handicap to production. This condition obviously caused considerable wage increase. At a later period the availability of labor had improved, but the manufacturer faced a shortage of raw material that tended to continue the curtailment of production.

The company always has endeavored to make deliveries dependent upon the purchaser's ability to install the coasting recorder equipments. As a rule the company has been able to make shipments for installation as fast as the purchaser's cars are available for equipment. For instance, if one company places a large order it is only necessary to make deliveries in accordance with that company's schedule for availability of its cars. In changing from summer cars to the regular equipment it is common practice to leave the relay and wiring intact on the car, removing only the coasting recorders.

PRICES FLUCTUATE WITH COPPER AND STEEL MARKET

Regardless of the rising costs of material and the numerous delays in obtaining it, this company did not at first increase its prices but pursued a policy of watchful waiting, as the conditions were considered abnormal. As soon as the surplus supply of raw material was exhausted and it was apparent that the basic materials for the product—copper, steel, etc.—would continue to rise, the company was forced to increase prices. These increases amounted to only about 10 per cent, with the exception of that for Rico anti-climbers, which was approximately 50 per cent. This was because a surplus of anti-climber material had been rolled on the special rolls owned by the company previous to the advance in materials, and when the stock was exhausted the price was increased in even less proportion than the increase in price of raw material.

PROGRESS BEING MADE

The experience of the past few years has proved that the electric railways are adopting certain standard devices in car equipment, and these are usually specified when an order for cars is placed. That real progress by the railways is being made is evident from the fact that many accessories—anti-friction journal bearings, improved fare boxes, coasting recorders, trolley retrievers, anti-climbers, sanitary straps, pneumatic door engines, etc.—are now in common use.

The requirements for a proper knowledge of traffic conditions which will permit not only of proper conservation of power but also economical schedule speeds make necessary the collection of data from which the existing transportation conditions can be analyzed. With this idea in view the company is developing a coasting and service recorder which will record accurately and automatically the number and duration of stops, running time, coasting time —in fact, will keep an absolute check on the changing factors constantly encountered in transportation service.

The cost of power for railways has materially increased, due to higher fuel and labor costs, and more thought is now being given to the need of its conservation. In view of the fact that the rate of fare is fixed and that costs of operation and overhead are increasing, the available method for maintaining the necessary financial status of a property is by reduction of operating expenses through every possible means of increased efficiency in operation.

Wheelmakers Favor Standardization of Flanges

Chilled Iron Wheel Renewals 2,500,000 Annually—Concentrating Efforts to Improve Product—Standardization Will Simplify Wheelmakers' Problems

The Association of Manufacturers of Chilled Car Wheels, of which George W. Lyndon, McCormick Building, Chicago, is president, represents wheel-casting plants having a capacity of 20,000 wheels per day. The annual wheel renewals for steam and electric railways, according to Mr. Lyndon, amount to 2,500,000 wheels per year, and this figure does not include the requirements for new cars. All the members of the association have had a satisfactory year and look forward to even better business for 1917, providing the car builders are able to turn out their orders on schedule. Just now, not many of the wheel plants are running at full capacity because of the scarcity of labor.

ASSOCIATION FAVORS STANDARDIZATION

This association, through its president, has expressed its hearty appreciation of the standardization work being carried on by the committees of the American Electric Railway Engineering Association. It is ready to co-operate to the fullest extent in the standardization of wheel flanges for city and interurban work.

Speaking of the need for standardization of wheel flanges in interurban service, Mr. Lyndon pointed out that a great many interurban roads are handling M. C. B. equipment. Some roads in connection with steam affiliations are using joint tracks, and all roads are tending toward higher speeds. As a natural consequence the requirements of heavy interurban service indicate the need for the use of a flange with a contour as near that of the M. C. B. standard flange as can be operated. Standardization of the flange, of course, would simplify the wheel makers' problem so far as furnishing equipment for interurban cars is concerned.

On the other hand, Mr. Lyndon says, there are many sections of rail in city properties that forbid the use of the M. C. B. flange, and so one of smaller dimensions must generally be chosen. The tendency throughout the country is to recommend a flange somewhat like the M. C. B., but flatter, say ⅝ in. in height.

The Chilled Iron Wheel Association members are concentrating their efforts on the improvement of their product.

At the engineering experimental station of the University of Illinois elaborate testing equipment has been put at the disposition of the wheel makers, and special studies are now being made. One of these includes an investigation of the stresses in all parts of the wheel, not only the stresses in the outer part of the wheel due to brake heating but also those in the hub and plate due to pressing the wheel onto the axle. Mr. Lyndon says that Dean Goss of the University of Illinois considers the work being done at the experimental station not only of great interest to the institution, because of its technical nature, but also of value to the public, because wheel service is such an important factor in successful transportation.

Helping Small Manufacturers in Export Trade

The full report now available for the Fourth National Foreign Trade Convention, held in Pittsburgh, Pa., on Jan. 25-27, shows that the most popular group sessions were those devoted to the foreign trade problems of the small manufacturer and merchant. The dependence of foreign trade on foreign investment, on banking facilities and a sound shipping policy was strongly emphasized, however, and, as stated in the preliminary report in last week's issue, the dominant note of the whole convention was co-operation.

Practically every problem of foreign trade expansion that confronts the small manufacturer and merchant when he desires to sell overseas had been covered in advance by a series of questions and answers, available to the convention in pamphlet form. These questions and answers served to draw out a great variety and volume of valuable experiences of the manufacturers and merchants present.

The sentiment of the convention, as a whole, was summed up in the report of the general convention committee. As has been customary in the past, no resolutions were presented. The committee merely reported what it considered to be the consensus of the convention, as developed in the papers and discussions. The development of foreign trade was said to depend upon the resources and enterprise of this country and on the education of a body of young men fitted for the demands of foreign trade and anxious to participate therein. It depends further on the participation of a large number of moderate-sized firms. The government can help in many directions by securing suitable commercial treaties, by collecting from abroad and disseminating here information regarding foreign requirements, by permitting co-operation, etc. The need for the prompt passage of the Webb bill was emphasized, while the necessity for a sound shipping policy, for straightening out the treaty situation and for a flexible tariff was discussed.

The present officers of the National Foreign Trade Council who were elected at the annual meeting held last fall are as follows: Chairman, James A. Farrell, who is president of the United States Steel Corporation; treasurer, Walter L. Clark, and secretary, Robert H. Patchin.

Future Business Prospects—Effect of Peace

According to the current review of the National City Bank, the first month of the new year has given good promise for a continuance of prosperity. The leading industries of the country made large profits last year, and are in a very strong position financially. Indebtedness has been paid or reduced, working capital has been increased, capacity has been enlarged and efficiency improved by expenditures in many instances long contemplated and finally made possible by the unusual earnings. The outlook for business is excellent, with bookings of firm orders sufficient to assure general industrial activity well into the last half of the year. The probably effects of peace upon industry are significant. A considerable readjustment of prices will be necessary and the demoralizing influence of falling prices are fully appreciated. However, manufacturers are buying materials with that thought uppermost, but current trade is on the largest scale ever known and provision must be constantly made for it.

The most talked of factor in the situation is the car shortage, which results less from an actual shortage of cars than from inability to keep the traffic moving freely. The situation, instead of being a temporary and passing one, seems to be due to the unparalleled expansion of industry, which has produced a volume of freight beyond the loading, unloading and warehousing facilities of the public, and the switching and terminal facilities of the railways.

Building operations reached record proportions in 1916, and at present the outlook is for another equally active year. The prices of all building materials are very firm or still tending upward.

The year starts out with money much the cheapest commodity or form of capital in sight, and if the business community attempts to use these abundant supplies the effect will be to lift wages and the prices of all materials still higher. The circle of rising wages and prices narrows as it moves upward, because everybody's income and purchasing power do not increase in the same proportion, and prudent men hesitate to make capital investments on an inflated basis.

Business has been so good during the past year that a great many producers have accumulated large profits and are more independent of borrowing facilities than heretofore. They are conservative about dividends, and intend to keep themselves forehanded.

The general level of bond prices continues to hold firm. The average price of forty listed bonds as compiled by the *Wall Street Journal* was 96.11 Jan. 26 compared with 94.97 Dec. 26. The advance has been especially noticeable in railroad issues.

CURRENT PRICES FOR MATERIALS

Quoted Thursday, Feb. 1.

Copper (electrolytic)	New York,	33 cents per pound
Rubber-covered wire (base)	New York,	38 cents per pound
No. 0000 feeder cable (bare)	New York,	35 cents per pound
No. 6 copper wire (bare)	New York	35 cents per pound
Tin (straits)	New York,	45¾ cents per pound
Lead	New York,	8 cents per pound
Spelter	New York,	10¾ cents per pound
Rails, A. S. C. E., O. H.	Mill,	$40 per gross ton
Rails, A. S C. E, Bess.	Mill,	$38 per gross ton
Wire nails	Pittsburgh,	$3 per 100 pounds
Steel (bars)	Pittsburgh,	3.25 cents per pound
Sheet iron (black, 28 gage)	Pittsburgh,	4.50 cents per pound
Sheet iron (galv., 28 gage)	Pittsburgh,	6.25 cents per pound
I-beams over 15 in.	Pittsburgh,	10 cents per pound
½-in. galv. extra high strength steel wire,	New York,	$6.82 per 100 ft.
⅝-in. galv. high strength steel wire	New York,	$3.41 per 100 ft.
⅜-in. galv. Siemens-Martin wire	New York,	$2.52 per 100 ft.
5/16-in. galv. Siemens-Martin wire	New York,	$1.94 per 100 ft.
Galvanized wire (ordinary)	Pittsburgh,	3.65 cents per pound
Cement (carload lots) without rebate for sacks,	New York,	$2.07 per barrel
Cement (carload lots)	Chicago,	$1.96 per barrel
Cement (carload lots)	Seattle,	$2.60 per barrel
Sand in large lots	New York,	50 cents per ton
Sand in large lots	Chicago,	$1.25 per ton
Linseed oil (raw, 5-bbl. lots)	New York,	96 cents per gallon
Linseed oil (boiled, 5-bbl. lots)	New York,	97 cents per gallon
White lead (100-lb. keg)	New York,	9¾ cents per pound
Turpentine (bbl. lots)	New York,	54½ cents per gallon

OLD METAL PRICES

Copper (heavy)	New York,	28½ cents per pound
Copper (light)	New York,	24 cents per pound
Red brass	New York,	19 cents per pound
Yellow brass	New York,	18 cents per pound
Lead	New York,	6.75 cents per pound
Steel car axles	Chicago,	$34 per net ton
Zinc		8 cents per pound
Iron car wheels	Chicago,	$18.50 per gross ton
Steel rail (scrap)	Chicago,	$24.50 per gross ton
Steel rail (relaying)	Chicago,	$30 per gross ton
Machine shop turnings	Chicago,	$9.25 per net ton

New York Railways to Be Equipped with Coasting Recorders

The New York Railways has just placed an order with the Railway Improvement Company for Rico coasting recorders to take care of its 1842 cars. With this order, all of the large electric railways operating in or entering New York will be equipped with Rico coasting recorders as follows: Interborough, elevated and subway, including the Corona and Astoria lines in Queens, 1718; Third Avenue Railway System, including Yonkers Railroad, Westchester Electric Railroad, 1125; Brooklyn Rapid Transit System for 300 New York Municipal subway cars; Hudson & Manhattan Railroad, 200; Long Island Railroad, 55; making a grand total of 5240.

ROLLING STOCK

Shreveport (La.) Railways has ordered four new light-weight, single-truck, double-end cars.

Wheeling (W. Va.) Traction Company is reported to be in the market for eight pay-as-you-enter cars.

Austin (Tex.) Street Railway has ordered seven light-weight, single-truck, double-end cars from the American Car Company.

North Carolina Public Service Company, Greensboro, N. C., has ordered fifteen light-weight, single-truck, double-end cars from the American Car Company.

Wichita Railroad & Light Company, Wichita, Kan., has ordered fifteen light-weight, single-truck, single-end cars from the St. Louis Car Company.

Urbana & Champaign Railway, Gas and Electric Company, Champaign, Ill., has added a snow-sweeper to its equipment.

Indiana Railway & Lighting Company, Kokomo, Ind., is in the market for two 35-ft. two-man, double-truck, double-entrance pay-as-you-enter motor cars for city service.

Ottawa Car Manufacturing Company, Ltd., Ottawa, Canada, has received an order from the Ottawa Electric Railway for three 38-ft., single-end, double-truck, semi-steel cars.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., has been authorized by the Public Service Commission of Illinois to issue $170,000 of equipment gold notes, the proceeds to be used for the purchase of fifteen steel cars.

Kansas City (Mo.) Railways during the coming year expect to purchase twenty-five cars at a cost of approximately $150,000. Coasting clocks or recorders will be installed on these cars.

Northern Ohio Traction & Light Company, Akron, Ohio, lost eight cars recently at Massillon in a fire which destroyed the company's substation and carhouse. The total loss was about $50,000.

Public Service Railway, Newark, N. J., noted in the ELECTRIC RAILWAY JOURNAL of January 27, has purchased at this time, seventy-five quadruple West. 514-C motor equipments with HLD control and twenty-five double West. 307-CV motor equipments with HL control. The GE No. 200 motors with PC control mentioned were ordered early in the fall and were noted in the ELECTRIC RAILWAY JOURNAL for September 30, 1916.

TRADE NOTES

H. D. Gumpper, who was formerly associated with the Emerson Company, efficiency engineers, has joined the electric truck sales department of the Buda Company, Chicago.

Diehl Manufacturing Company, Elizabeth, N. J., announces the change of address of its Chicago storeroom and repair department to 313 South Clinton Street.

Philadelphia Holding Company, Philadelphia, Pa., has received an order from the Fishkill Electric Railway for four radial trucks and also an order for one radial truck from the Levis County Railroad, Quebec, Canada.

Safety Car Devices Company, St. Louis, Mo., announces that it has received orders for air brake and safety-control equipment to be used on the cars being constructed for the following companies: Wichita Railroad & Light Company, fifteen cars; North Carolina Public Service Company, fifteen cars; Austin Street Railway, seven cars, and the Shreveport Railways, four cars.

Horne Manufacturing Company, 50 Court Street, Brooklyn, N. Y., announces that Albert C. Henry has been elected president of the company, and will now devote a considerable amount of his time to the electric railways in the vicinity of New York City. Mr. Henry was formerly connected with the Cooley Manufacturing Company, and with the National Carbon Company.

R. H. Beaumont Company, Philadelphia, Pa., builder of coal- and ash-handling machinery, etc., announces the opening of a New York office in the Hudson Terminal Building, 50 Church Street. The office will be in the charge of William P. Alexander, who has been associated with the company for a number of years in the capacity of field superintendent, assistant chief engineer and sales engineer.

Charles H. Clark, engineer maintenance of way, Cleveland Railways Company, has recently received orders for the Clark pavement plow from the United Railways, St. Louis; the Twin City Rapid Transit Company, Minneapolis; the Brooklyn Rapid Transit Company and the Public Service Railway, Newark, N. J. These plows are in use at present in Detroit, Boston, Buffalo and Cleveland.

Harry T. Bigelow, who for sixteen years was Western representative of the Hale & Kilburn Company, has decided to re-enter the railway supply field and is organizing a strong company to take a general line of specialties for use among the electric and steam railroads. Mr. Bigelow found it necessary about five years ago to retire from active work because of ill health. His many friends in the railway field will be pleased to learn that he is again to become active in the supply field. It has not yet been announced what products he will handle.

American Railways Equipment Company, Dayton, Ohio, announces the completion of its organization for the manufacture and sales of the American coin-ticket registering fare box. Adam Schantz, representing the industrial committee of the Greater Dayton Chamber of Commerce and associated capitalists, supervised the financing of the company. D. B. Whistler, inventor and patentee of the fare box, is president and general manager. Under the new organization, plans have been effected for manufacturing the fare boxes on a scale to meet requirements. The company has recently received an order from the City Railway of Dayton to equip all its cars with American coin-ticket registering fare boxes. More than 100 fare boxes will be required to complete the order.

ADVERTISING LITERATURE

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has just issued a catalog on "Arc Lamps and Lighting Systems."

Morse Chain Company, Ithaca, N. Y., has issued publication No. 15, "A Chain of Evidence," which deals with power drives of less than 100 hp. each.

Composite Metal Lath Company, 128 Broadway, New York, N. Y., has issued a circular showing a cut of a 2¼-in. electric cable illustrating the use of brick lath as a base for protecting cables in manholes from fire.

Cement Gun Construction Company, Chicago, Ill., has issued bulletin No. 5 on "Gun Crete for Protection." This bulletin gives a number of illustrations of buildings protected by this waterproof and fireproof material, which is composed of cement and sand.

Spray Engineering Company, Boston, Mass., has issued bulletin No. 250 which illustrates and describes its "Spraco" equipment for washing and cooling the ventilating air for steam turbine-driven generators and other equipment.

NEW PUBLICATIONS

United States Government Specifications for Portland Cement. Bureau of Standards, Department of Commerce, Washington, D. C., Circular No. 33. Forty-three pages. Paper.

The third edition of this specification is now ready for distribution and can be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 10 cents per copy.

Les Chemins de Fer en Angleterre, by J. Carlier and H. Dedroog. A reprint from Le Génie Civil, 6, Rue de la Chaussée-d'Antin, Paris, 1916. 168 pages. Paper.

This reprint contains a series of articles on steam railroads and heavy electrifications in England. The authors are Belgian railway engineers, temporarily residing in England. They have compiled data on the principal railway systems, arranging them topically and commenting upon the tendencies indicated by their studies. In the electrical section chapters are devoted to general considerations, line, power generation and distribution, finances and conclusions.

Electric Railway Journal

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Consolidation of Street Railway Journal and Electric Railway Review

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BOSTON AND THE MID-YEAR MEETING

Boston is a particularly appropriate place for the meeting of the American Electric Railway Association which will be held there next Friday. In that city and vicinity are being threshed out some of the most important financial problems of the industry. During the few years just past the Boston Electric Railway and the Bay State Street Railway have faced some very difficult situations. They have, while trying on one hand to control expenses at thesame time furnishing adequate service, endeavored to impress on the public the necessity for financial relief. Of course, these conditions are confronted in many other communities but they are peculiarly acute in Boston now. Fortunately the local regulative authorities appreciate in a large degree the strenuous nature of the task before the railway managers and are affording some measure of relief. An example is the finding, abstracted elsewhere in this issue, of the special commission appointed by the legislature to consider the Elevated situation. This commission has endeavored to find ways of ameliorating conditions for the company without increasing the rate of fare. The result is encouraging as an augury of future additional relief. In view of the sympathetic attitude of the authorities the fact that representatives of the Commonwealth of Massachusetts and the City of Boston will speak at the meeting adds to the interest of the occasion. The diplomatic crisis which shadows all individuals and gatherings throughout the country will also tend to render this a most impressive meeting.

THE ELECTRIC RAILWAYS' SHARE IN WAR

Now that a definite possibility of war confronts the nation it is natural that each red-blooded individual and organization should turn to consideration of how best to "do his bit." For the electric railway industry as a whole the character of the "bit" is perhaps most readily outlined by an explanation of what the American Electric Railway Association has in hand, and the duties of the railways are happily covered with the admonition merely to co-operate promptly with the simple plan that is now under way. A telegram from General George H. Harries, printed on page 249 of this issue, tells how the electric railways can assist the government to the best advantage. In brief, the association has appointed a committee whose members are assigned to districts embracing the whole of the Atlantic and Pacific coasts. Each committeeman is to prepare a complete map of electric railways within his district marked to show the physical characteristics of each property and its equipment. This will indicate at a glance such details as width of gage, wheel-flange dimensions, height and type of couplers, maximum clearance lines, actual and possible physical connections with steam railroads, and other information regarding the possibility of using any line for through routing of troops and munitions. When all coastal districts have been completely mapped (and this should take but a short time with proper co-operation) attention will be turned to the interior railways, and there will be available for the War Department a comprehensive enumeration of all facilities that exist in the electric railway field. These facilities, as well as everything else in war time, may be requisitioned by the government, and the government will, with the new map, be in position to pick out that which it can use to best advantage. Here, at least, is a definite duty for the electric railway industry to perform. When the requests for data from the district committeemen are received it is up to each company to answer and to answer at once. After that, all that needs to be done is to obey orders.

ADVERTISING IN RAILWAY COMPANY PUBLICATIONS

A notice in the monthly just started by the Georgia Railway & Power Company for distribution among employees, officers and owners is headed "No Space for Sale Here." The announcement then goes on to say that even if the King of England or the Emperor of Germany were to beg until tears rolled down their cheeks for advertising space in the publication, they couldn't buy so much as half an inch of a single column. "Our space is not for sale to anybody for any purpose. No, sir!" says the company. We are glad to see this clear-cut statement. Sentiment on the ethics as well as the business policy which should govern electric railway companies in soliciting advertising for their publications seems to be consolidating. Four prominent managers wrote us letters which appeared in our issues of Jan. 13 and Jan. 20 indorsing the position which we took in our issue of Jan. 6, condemning on ethical grounds all solicitation of advertising by a railway company from manufacturers who hope to do business with it. A letter from another prominent manager, just received, says: "I object to that form of graft very strenuously." We believe that many others agree with him. There is no such thing as "honest graft." The excuse that the plan is not ideal but "we need the money" is equivalent to a confession of the impropriety —to use no stronger word—of the whole proceeding. We have not criticised the solicitation of advertising from local merchants for company publications, simply from concerns with which the company is doing business or may do business in the future. Nevertheless, we are glad to see that no advertising of any kind is carried in the two company publications beginning during the past two weeks, namely the Atlanta paper just mentioned and that of the Public Service Corporation of New Jersey.

INTERURBAN FINANCIAL REPORTS Mr. Doolittle has presented to the industry this week, in his second article on interurban railways, a valuable compilation of interurban financial data. In addition, he has showed in a clear way the question that must be answered in order to ascertain the causes of the present showing and to find what, if any, remedy is needed. He has, therefore, treated our readers to more than is required by the primary subject, the anatomy of the interurban report, for this means simply a dissection or study of the structure of such a report. The advanced material we shall pass over with the comment that it is well worth the serious consideration of electric railway officials. We now desire to emphasize simply one point—that the structure of most interurban financial reports is queer. Mr. Doolittle in kindness has presented a sort of composite anatomical picture, made up from various sources, so that the deformities of particular reports are not visible. That these exist, however, is uncontrovertible. Some annual reports seem nothing more than a skeleton with scarcely a backbone left. In other words, they consist of only an abridged income statement and a balance sheet, often distorted from their proper official form, and carrying with them none of the other parts and general information that go to make up a well-rounded flesh-and-blood report. This applies, of course, to reports of city railway companies as well as to those of interurban lines, for electric railways as a whole fail to pay sufficient attention to the structure of these statements. Mr. Doolittle's present article mentions various points that ought to be answerable from a report. It will be a good test of the proper structure of yours. Try it.

KEEPING THE TRACKS CLEAR

Street car tracks were not laid for trucks, automobiles and other vehicles, in spite of what the unsophisticated backwoodsman might think if he watched the traffic on an ordinary city thoroughfare for a few minutes. It is difficult, however, to make the public take seriously any plea of the railways for an unrestricted use of their own facilities. The reason for this is that the average man, even when he is a passenger on a delayed electric car, does not visualize the conditions from the electric railway standpoint. He is much more apt to assume that the company is to blame because the cars are not going faster than to realize that every blockade of the tracks is a source of expense to the company in useless car-hours.

For these reasons, municipal authorities and public representatives would render an important service to all if they would help to bring this point more closely home to the public. An excellent example of public-spirited work along this line is the recent survey initiated by the Chicago *Herald* for the sole purpose of explaining to the public the real causes of car delays. The causes ascertained by ordinary reportorial diligence—*i.e.*, both an unnecessary usurpation of the car tracks by vehicular drivers and a forced use of such because of automobiles parked at curbs—are not new to our readers, but we wish to commend the enterprise with which they have been brought emphatically to the attention of Chicago citizens.

The problem involved is one, of course, that is up for solution not only in Chicago but also in other cities. The daily service reports of the Detroit lines, for example, are "alive" with instances of delays due to vehicular traffic, and the New York Railways has just issued a bulletin to show traffic conditions in the metropolis. In fact, never before has the subject of relief from traffic congestion in our larger cities required such urgent attention as at this time. The problem has been complicated, as the Chicago *Herald* intimates, by the enormous increase in the number of automobiles. New York City, for example, showed an increase in 1916 as compared to 1915 of from 86,000 to 116,000 pleasure automobiles and from 14,000 to 21,000 commercial motor vehicles. The automobile invasion has been particularly demoralizing in this city, where streets are already blocked with building operations, subway and pipe-line construction and repaving. Another complication, not so general, is the blockading of tracks after heavy snowstorms, for shortage in the municipal snow-fighting forces has resulted in automobiles and trucks taking advantage of tracks cleaned by the street railway's snow plows. Such a practice, for instance, after one recent storm was largely responsible for a 25 per cent reduction in the New York Railway's daily car mileage.

The alleviation of traffic congestion is a difficult task, but many are the suggestions as to the proper method to be used. Some proposals, such as widening streets by reducing the width of sidewalks in order to provide for two streams of vehicle traffic in the same direction outside car tracks, etc., need mature consideration owing to the expense involved. Other suggestions are more practicable. For example, one desirable improvement which could be widely and easily adopted, would be to increase the number of sections on important streets to be forbidden as parking places during rush hours. Vehicles at these points should not be allowed to stop longer than to discharge or take on passengers. Parking privileges limited to a short period, such as half an hour, are inadvisable because the duration of the privilege is likely to be abused. Street car operation could also be accelerated by closing crowded streets to trucks during rush hours. Moreover, co-operation between traffic officers in moving traffic in unison and the further adoption of the semaphore system of control, as on Fifth Avenue, New York, might be secured, although the latter practice is opposed by the Milwaukee police commissioner on the ground that traffic might be blocked if the officer left his post in case of an accident or other emergency.

Whatever one of these or other plans is adopted, however, it seems logical to place the business of traffic regulation in the hands of an expert body appointed solely for the purpose of devising and considering plans to relieve congestion and enforcing these by means of co-ordination between the various city departments. The Chicago Traction and Subway Commission, the recently established Des Moines traffic bureau, and the traffic commission just proposed by Police Commissioner Woods of New York—these are good examples of the special traffic commission or bureau that it would seem advisable for each large city to appoint. Such a body, even more than an important newspaper, can give the desired stamp of authority to the genuineness of the railway burden.

APPLYING THE PRINCIPLES OF PUBLICITY

A friendly critic has directed our attention to the close parallel which exists between the service which the JOURNAL is giving and aims to give, and that which a public utility gives and aims to give. He suggests that undoubtedly many of the adverse financial conditions existing in the electric railway field at present, such as a stationary basis for receipts with increased cost of operation, must apply to the publishing business as well, that the cost of the improvement in service to its constituency during the past ten or twenty years, which he considers has been as marked in the case of this paper as with the electric railways, has further increased the expenses, and that in many other ways a close parallel exists. He goes on to say that the JOURNAL has long been urging the electric railways to use publicity to develop a spirit of co-operation between the public and themselves and that it is about time that we should "take our own medicine." We recognize the parallel and acknowledge the impeachment.

We believe that the first obligation of a newspaper like that of a public utility is service to its public, to quote Clause I of the Code of Principles adopted by the American Electric Railway Association at Atlantic City in 1914. In fact, most if not all of the articles in this code apply to newspapers just as well as to electric railways. Like the utility, the technical paper is bound to succeed or to fail on the basis of the service which it renders to its field. The obvious corollary to this, both in the railway business and in journals, is that co-operation on the part of the public served is necessary to good service. This, then, is the purpose of this editorial, namely, to take the advice which has been offered to us to say something about our policies and to ask, as every railway or newspaper should, for constructive criticisms and suggestions. If we are not doing all that we can we want to know it so that we may improve the paper.

As explanatory of the kind of service which we aim to supply we shall therefore briefly mention some of the things which the JOURNAL has done during recent years and some of its present aims.

The most important subject now before the electric railway industry, in our opinion, is publicity and the improvement of public relations, matters which this paper has long urged with all the resources at its command. We have shown our interest in the matter by publishing symposiums and single articles by experts on publicity and public relations, by running a series of cartoon editorials devoted entirely to these subjects, by reproducing notable newspaper and other advertisements and by editorial suggestions in nearly every issue. We intend to continue this campaign vigorously; and in doing so we solicit the support of those who agree with us that this is one of the "high spots" in the electric railway field.

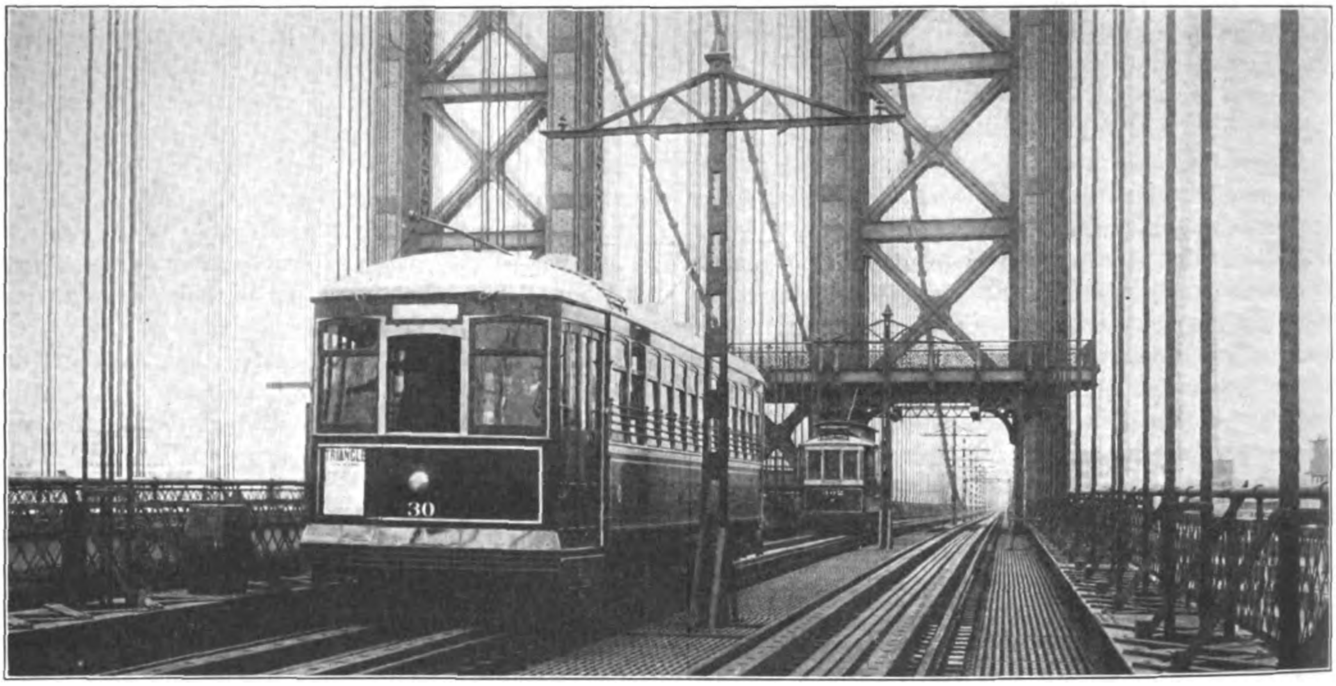
Another example of the service which can be performed by a paper able to carry a message promptly to all connected with an industry is furnished by the accident reduction agitation. In a letter recently received from one of the pioneers in safety work, the writer says: "The phenomenal growth of the movement was in large measure due to the generous and far-sighted support given to it by the ELECTRIC RAILWAY JOURNAL. The JOURNAL recognized the possibilities of the project as far back as 1907, when railway companies which had been appealed to for moral support had shown themselves indifferent." The JOURNAL supported this movement not only because it considered that it was right but also because it realized that the safety movement meant large direct and indirect savings to the railways. Both of these results have been proved by subsequent experience.

Another example of the service which this paper has given to the industry is shown by its articles on car design. This paper was an early advocate of steel cars for city service, not because of any expectation of their greater safety, but because it believed that steel cars could be made cheaper and better than wooden cars. It advocated this type of construction at a time when many if not most of the car builders were still recommending wooden cars. It also early favored a type of construction in which the strength of the steel car was provided in the side girders in opposition to the old style of construction which resembled "a house on a flat car," and it has seen this idea generally accepted. Still other recent instances of JOURNAL service will be found in its advocacy of a modification of the M. C. B. journal box for high-speed electric service, of standardization of car and truck design, of rational units in rating boilers, of higher rates of fare, of discontinuance of the soliciting of advertisements from manufacturers for company publications, of better training of employees, of military preparedness for electric railways, etc.

We are mentioning these points as examples, not with the idea of depreciating the constructive work of others along these lines or of arrogating to ourselves more than is our due. All have assisted, and this is the point which we want to make, namely, that just as the transportation utility in any city can be helped to give good service by the co-operation of all, so it is in journalism. The converse of this is equally true in journalism and railroading. This is that the welfare of the community concerned is correspondingly increased when it has a service broad and extensive enough to reach all who have occasion to use it. This, in the journalistic field, would include operator, manufacturer, regulator, investor and public.

Catenary Trolley Construction Used on Manhattan Bridge to Insure Safety

Security Against Damage to Bridge, Good Operating Features and Attractive Construction Obtained by Using Simple Catenary with 90-ft. Pole Spacing

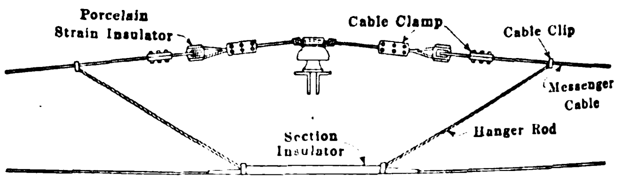


CATENARY TROLLEY CONSTRUCTION ON MANHATTAN BRIDGE—VIEW OF COMPLETED CONSTRUCTION AND FIRST TWO CARS TO CROSS BRIDGE UNDER NEW OVERHEAD WORK

The Manhattan Bridge Three-Cent Line runs between the corner of Flatbush Avenue and Fulton Street, Brooklyn, N. Y., and the corner of the Bowery and Canal Street, Manhattan. The route is 2 miles long, about half the distance being over the Manhattan Bridge. This line had been operated on the lower-deck tracks of the bridge, but since these tracks were intended to be used by the rapid transit line connecting the subways in Manhattan and Brooklyn, it became necessary to operate the Three-Cent Line on the upper deck. This made it essential to adopt a method of supporting the trolley wire which would give the maximum degree of safety as well as good operating conditions. A construction which would not detract from the attractive appearance of the bridge was also desirable.

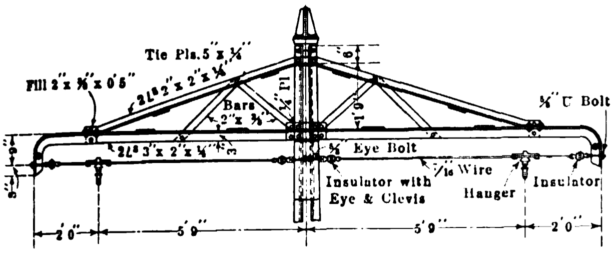
The use of the usual span-wire construction was not feasible in this case since a double row of trolley poles would be required and any method of supporting the trolley wire directly from span wires or from poles spaced say 50 ft. apart was considered unsafe since the copper wire, if broken, might come in contact with and burn to a dangerous degree some of the vital members of the bridge. The catenary construction shown in the accompanying illustrations was therefore decided upon, and it has been so installed that if the contact wire should break, the hangers are spaced close enough together to prevent the freed ends of the wire from coming in contact with the steel members of the bridge.

The average pole spacing is 90 ft., the height of the contact wire above the top of the rail is 16 ft., and the distance between the contact wire and the messenger wire at the insulators is 20 in. The details of the length and spacing of the hangers for a typical 90-ft. span are given by the diagram on the opposite page. A 7/16-in. Siemens-Martin double galvanized, seven-strand steel cable was used as a messenger wire. This was strung in the usual manner, and the sag adjusted so that the middle of each span was 16 ft. 10 in. above the top of the rail. Roebling Brother's No. 000, hard drawn, standard grooved copper wire was used for the contact wire. While stringing this wire it was allowed to rest at the ends of the crossarms, and as the hangers were attached the wire was slipped over the ends of the crossarms. One of the illustrations shows two gangs at work attaching the catenary hangers. The tower cars were made by erecting a scaffolding on an ordinary flat truck.

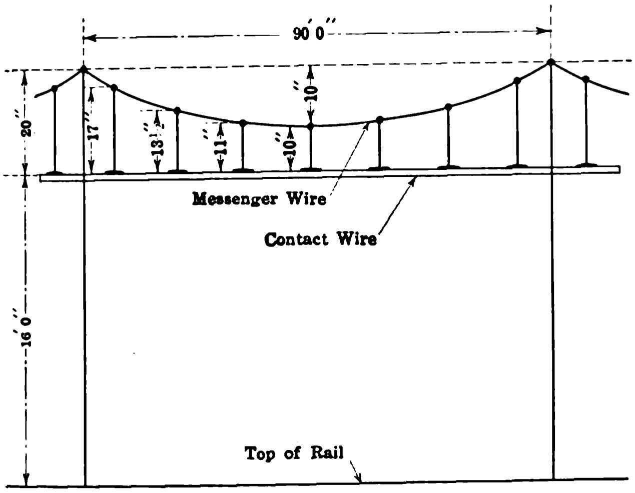


CATENARY TROLLEY CONSTRUCTION ON MANHATTAN BRIDGE—DETAILS OF INSULATED JOINT

At the expansion joints of the bridge, steel bar construction is used in place of the catenary. The bar is


Tie Pls. 5" x ⅛"
Fill 2" x ⅜" x 0' 5"
2 L^s 2" x 2" x ⅛"
Bars 2" x ⅜"
¼" Pl.
1' 0"
9"
⅝" U Bolt
2 L^s 3" x 2" x ¼"
⅝" Eye Bolt
7/16" Wire
Insulator with Eye & Clevis
Hanger
Insulator
2' 0"
5' 9"
5' 9"
2' 0"

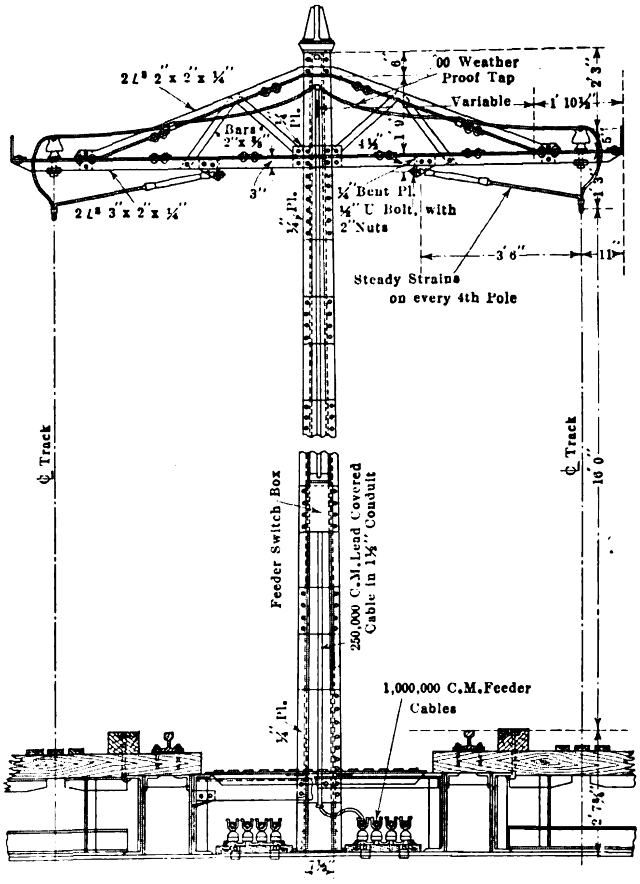
CATENARY TROLLEY CONSTRUCTION ON MANHATTAN BRIDGE—METHOD OF SUPPORTING TROLLEY WIRE ON BRIDGE APPROACHES WHERE CATENARY WAS NOT NECESSARY FOR PURPOSES OF SAFETY


90' 0"
20"
17"
13"
11"
10"
10"
Messenger Wire
Contact Wire
16' 0"
Top of Rail

CATENARY TROLLEY CONSTRUCTION ON MANHATTAN BRIDGE—LENGTH AND SPACING OF HANGERS FOR A TYPICAL 90-FT. SPAN

made in sections, the adjoining ends of which are far enough apart to allow for the expansion and contraction of the bridge. A bronze sleeve of ⅛-in. metal connects the ends of the steel bar and provides the bearing surface for the trolley wheel at these points. A wooden trough provides a suitable protection over the bar. This may be seen under the bridge tower in one of the illustrations.

CATENARY TROLLEY CONSTRUCTION ON MANHATTAN BRIDGE—CONSTRUCTION GANGS ATTACHING HANGERS BETWEEN MESSENGER WIRE AND TROLLEY WIRE


2 L^s 2" x 2" x ¼"
00 Weather Proof Tap
9"
2' 3"
Variable
1' 10½"
Bars 2" x ⅜"
¼" Pl.
1' 0"
4½"
5"
3"
2 L^s 3" x 2" x ¼"
¼" Bent Pl.
½" U Bolt, with 2" Nuts
1' 3"
¼" Pl.
3' 6"
11"
Steady Strains on every 4th Pole
℄ Track
℄ Track
16' 0"
Feeder Switch Box
250,000 C.M. Lead Covered Cable in 1½" Conduit
1,000,000 C.M. Feeder Cables
¼" Pl.
2' 7½"
1½"

CATENARY TROLLEY CONSTRUCTION ON MANHATTAN BRIDGE—DETAILS OF STEEL POLE AND FEEDER CABLES

The drawing giving the details of the steel pole also shows the steady braces which are used at every fourth pole and the taps between the trolley wire and the eight 1,000,000-circ. mil, weatherproof cables which are supported on substantial feeders insulators on each side of the base of the pole. From these feeders, a 250,000-circ. mil, lead-covered cable in 1½-in. metal conduit leads to the feeder switch box, which is located at a convenient height on the pole and contains a 400-amp., quick-break disconnecting switch. The 250,000-circ. mil cable is continued from the switch box to the top of the pole, where it divides into No. 00 weatherproof cables, which connect with the contact wire. It was considered necessary to use lead-covered cable inclosed in metal conduit for the feeder connections on the pole in order to make them doubly safe from possible grounds to the steel poles. The trolley wire is divided into sections by insulated joints, and each section is fed by separate taps from the feeder cables so that each section is an independent electrical unit.

On the approaches to the bridge span-wire construction was used, since the catenary was not necessary for purposes of safety. The drawing in the top, left-hand corner of the page shows the details of this construction, which have been worked out by attaching the trolley wire in such a way as to make the appearance as attractive as possible and in harmony with the catenary construction on the bridge.

Since this construction has been in operation for some time without any trouble developing, it is good evidence that the requirements of safety have been well met. The construction above described was designed by the department of plant and structures, New York City, of which F. J. H. Kracke is commissioner and E. A. Byrne is acting chief engineer, and was built by Peet & Powers of New York.

Anatomy of the Interurban Report

Development of Electric Railway Accounting—General Characteristics of Typical Interurbans: Large Companies; Medium-Sized Companies with Less Than 20 Per Cent of Revenue From Freight, and Companies with More Than 20 Per Cent of Revenue From Freight — Sources of Information — Purpose and Scope of Analysis of Records—Methods, Limitations and Results of Analysis of Records

By F. W. DOOLITTLE

Consulting Engineer, New York, and Formerly Director of the Bureau of Fare Research,
American Electric Railway Association

IN a previous article* it was pointed out that many causes have been contributing during recent years to the difficulties of interurban electric railways. By no means all interurbans have been subject to these perplexities. A number of properties have been so fortunate as to avoid situations which have brought others to grave financial difficulties, and some companies have been in a position to meet and overcome the difficulties confronting them. It should not be necessary to point out that the general comments made here and elsewhere, while applying to the industry as a whole, are frequently far from true when applied to individual properties.

Each company has its peculiar elements of strength and weakness, and nothing short of a careful and critical studying of a property together with local conditions will suffice to serve as a basis of judgment. Certain facts concerning the industry as a whole can, however, be determined from an examination of existing records without a knowledge of conditions other than can be gained from published financial and statistical reports.

Electric railway accounting has developed rapidly in recent years and is now reaching a stage where cost analysis is possible. In this it follows the development which is taking place in steam railroad accounting. Originally the accounts of carriers served two purposes: The first was to account for all income and thus enable the officers and directors to explain to the stockholders why so small a part of the gross earnings was available for dividends. The second purpose was to enable each superior officer to present to the men under his jurisdiction a statement of the expenditures of their departments, with a request for an explanation of any changes from the preceding month and the same month of the preceding year. It happened that for many years the train-miles and miles of track of most railroads increased regularly, and each department found in this a ready explanation for increased costs. As a result, railroad accounting systems developed a departmental classification, and "train-miles" and "track-miles" became the almost universal units with which costs were measured. Electric railways naturally followed as closely as practicable the accounting classification of steam railroads, and interurban properties, developing originally from urban properties, have used the same system.

FINDING THE REMEDY

"The question 'What can be done to correct unfavorable features of interurban operation?' cannot be answered from data contained in published reports. Only careful study by capable men can result in the best plans for the future. It is possible, however, to obtain some idea as to the likelihood of improvements from examining the following points:

"1. Is the revenue received for present business at a rate above or below the average?

"2. Is the present cost of operation above or below the average cost?

"3. Does the present volume of traffic appear to be normal for the communities served;

"4. Do the communities served appear to be developing so as to furnish more business in the future?"

"The third and fourth questions refer to what is probably the most important single factor in judging the future. The important thing is the relation between the ratio of gross revenue to investment today and the possible future ratio of gross revenue to investment."

Owing to their isolation and to the fact that they serve usually but one state, electric railways have been slower in reaching uniformity of accounting procedure than have steam roads. Since 1908, however, the adoption of a standard system has progressed rapidly owing to the study of this matter by the American Electric Railway Accountants' Association and the several commissions, as well as because of the authority of the Interstate Commerce Commission and other commissions to prescribe an accounting system. The present standard system was promulgated by the federal commission in 1914 and is therefore used by all interstate electric railways. A number of state commissions have adopted this classification as standard (sometimes slightly modified in form), and the American Electric Railway Accountants' Association at its convention in 1914 also adopted it.

The 1914 classification of operating expenses differs in several important particulars from its predecessor.† It has been in use too short a time to have resulted in a body of statistics of sufficient size to permit its use at present. Therefore, in the following paragraphs where figures of electric railway operation are cited they have been taken from reports made under the earlier (1908) classification.

In the previous article, in the issue of Sept. 2, 1916, comment of a general nature was made on the status of electric interurban transportation. It is now proposed to supplement this by an analysis of available reports of operating companies with the idea of illustrating the customary methods of analysis used in such cases, as well as the structure of such reports and the general results of operation as disclosed by the data contained in them.

THREE HYPOTHETICAL INTERURBAN PROPERTIES

As a preliminary to this study, three properties have been assumed based on an analysis of the published reports of 145 interurban electric railways operating over 13,000 miles of single track in about twenty states. The three companies are purely hypothetical, but represent the normal characteristics of a large number of companies of the same class. They may be described as follows:

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*See "The Present and Future Development of Interurban Railways," ELECTRIC RAILWAY JOURNAL for Sept. 2, 1916, page 392.

†For a discussion of the changes made, see ELECTRIC RAILWAY JOURNAL for June 13, 1914, page 1321.

The first is a large company whose characteristics are a composite or average of those of six of the largest interurbans in the United States.

The second is a company of average size whose characteristics are a composite of those of 128 companies, none of which has freight earnings in excess of 20 per cent of its operating revenue.

The third is a company of average size whose characteristics are a composite of those of seventeen companies, none of which has freight earnings amounting to less than 20 per cent of its operating revenue.

Tables I to IV show respectively the principal characteristics, the income statement, the operating revenues and the operating expenses of these three hypothetical properties. These tables, together with Table V, a condensed balance sheet, contain the data usually available from public sources.

In selecting the data used in computing these tables care was used to exclude all companies having any considerable part of their operation in cities. In many cases a knowledge of the property served to assist in the interpretation of the published figures, and in a few cases data were rejected because of obvious inconsistencies. In this study the most frequent sources of information were the statistical and financial reports published by the various state commissions. Those who are interested in the analysis of interurban reports, however, usually find one of the chief difficulties to be the fact

TABLE I—PRINCIPAL CHARACTERISTICS OF THREE HYPOTHETICAL INTERURBAN RAILWAYS

	Composite of Six Large Companies	Composite of 128 Medium-sized Companies—Freight Revenue Less than 20 Per Cent of Total Revenue	Composite of Seventeen Medium-sized Companies—Freight Revenue More than 20 Per Cent of Total Revenue
Miles of single track operated	475.53	89.8	89.8
Revenue cars available for service:			
Passenger	248	83	29
Express, etc.	41	3	10
Freight	340	23	232
Total	629	109	271
Car miles operated per year:			
Passenger	9,363,750	2,848,000	1,042,000
Other	1,755,537	148,900	483,000
Total	11,119,287	2,996,900	1,525,000
Revenue passengers carried per year	25,470,671	8,635,000	1,350,000
Miles per car per year:			
Passenger	37,700	33,700	24,250
Other	4,610	5,750	2,140
Total	17,750	27,700	5,300
Miles per hour:			
Passenger cars	16.74	12.10	12.61
Freight cars	6.00	6.23	3.05
Total	13.05	10.25	6.78

TABLE II—INCOME STATEMENT OF THREE HYPOTHETICAL INTERURBAN RAILWAYS

	Composite of Six Large Companies		Composite of 128 Medium-Sized Companies—Freight Revenue Less Than 20 Per Cent of Total Revenue		Composite of Seventeen Medium-Sized Companies—Freight Revenue More Than 20 Per Cent of Total Revenue	
Item	Amount	Per Cent of Revenue	Amount	Per Cent of Revenue	Amount	Per Cent of Revenue
Operating revenue	$3,388,500	100.0	$689,500	100.0	$488,000	100.0
Operating expenses	2,202,000	65.0	446,200	64.7	314,000	64.3
Net operating revenue	$1,186,500	35.0	243,300	35.3	173,000	35.7
Non-operating income*	303,840	9.0	48,250	7.0	13,680	2.8
Gross income	1,490,340	44.0	291,550	42.3	187,680	38.5
Deductions from income	1,701,550	50.4	230,610	33.4	205,290	42.0
Taxes†	154,730	4.5	45,700	6.6	23,850	4.9
Rentals	515,570	15.4	43,400	6.3	4,570	0.9
Interest	1,015,200	30.0	139,500	20.2	172,500	35.3
Miscellaneous	16,050	0.5	2,010	0.3	4,370	0.9
Net corporate income	(*d*) 211,210	6.4	60,940	8.9	(*d*) 17,610	3.5
Dividends	226,000	6.7	55,000	8.0	3,030	0.6
Other appropriations	5,201	0.1	......	...	.....	...
Surplus or deficit for year	(*d*) 442,410	13.2	5,940	0.9	(*d*) 20,640	4.1
Operating ratio	.650	....	.647	...	.643	...

(*d*) Deficit.

* For the use of railways operating other utilities as gas, telephone, etc., "Auxiliary Operations" accounts are provided. Net revenue-auxiliary operations precedes non-operating income in the income statement.

† Later classifications provide for deducting railway taxes directly from net operating revenue.

TABLE III—OPERATING REVENUES OF THREE HYPOTHETICAL INTERURBAN RAILWAYS

	Composite of Six Large Companies		Composite of 128 Medium-Sized Companies—Freight Revenue Less Than 20 Per Cent of Total Revenue		Composite of Seventeen Medium-Sized Companies—Freight Revenue More Than 20 Per Cent of Total Revenue	
Item	Amount	Per Cent of Revenue	Amount	Per Cent of Revenue	Amount	Per Cent of Revenue
Total operating revenue	$3,388,500	100.0	$689,500	100.0	$488,000	100.0
1 Passenger revenue	2,836,980	83.7	608,500	88.3	309,400	63.0
2 Express	94,480	2.8	9,400	1.3	7,020	1.4
3 Milk	28,880	0.9	3,450	0.5	4,620	0.9
4 Freight	311,870	9.1	41,590	6.0	126,450	26.1
5 Switching	2,870	0.1	260	0.1	4,810	1.0
6 Other train	15,380	0.5	4,420	0.6	7,100	1.4
7 Other transportation	5,420	0.2	750	0.1	12,000	2.5
8 Other operating	92,620	2.7	21,130	3.1	16,600	3.4
Total 2 to 5 inclusive	438,100	12.9	54,700	7.9	142,900	29.4

TABLE IV—OPERATING EXPENSES OF THREE HYPOTHETICAL INTERURBAN RAILWAYS

	Composite of Six Large Companies		Composite of 128 Medium-Sized Companies—Freight Revenue Less Than 20 Per Cent of Total Revenue		Composite of Seventeen Medium-Sized Companies—Freight Revenue More Than 20 Per Cent of Total Revenue	
Item	Amount	Per Cent of Revenue	Amount	Per Cent of Revenue	Amount	Per Cent of Revenue
Total operating expenses	$2,202,000	65.0	$446,200	64.7	$314,000	64.3
Way and structures	404,350	12.0	75,550	10.9	57,200	11.8
Equipment	299,520	8.9	53,800	7.8	43,300	8.9
Traffic	34,970	1.0	4,350	0.6	8,900	1.7
Power	375,390	11.0	70,600	10.4	51,900	10.7
Conducting transportation	750,790	22.2	181,000	26.2	101,900	20.8
General and miscellaneous	336,980	9.9	60,900	8.8	50,800	10.4

that information from these sources is out of date before it is published. This criticism applies also to the reports of the Census Bureau. The latter reports do not separate data so as to show the results of city, suburban and interurban operation. While in the past there has been little need of any separate showing, the increasing tendency of regulating bodies to base rates on costs is creating a demand for more detailed information. This will no doubt be reflected in the future studies prepared by the Census Bureau.

TABLE V—CONDENSED BALANCE SHEET OF THREE HYPOTHETICAL INTERURBAN RAILWAYS

Assets		Liabilities	
Composite of Six Large Companies:			
Property, plant and investment	$40,866,000	Securities	$43,000,000
Material and supplies	55,000	Special accounts	1,677,500
Bills receivable and miscellaneous assets	49,000	Bills payable and miscellaneous liabilities	3,758,500
Reserve, sinking and special funds	6,950,000	Unfunded reserves	1,564,000
Cash	1,545,000		
Deficit	535,000		
	$50,000,000		$50,000,000
Composite of 128 Medium-Sized Companies—Freight Revenue Less Than 20 Per Cent of Total Revenue:			
Property, plant and investment	$6,400,000	Securities	$6,000,000
Materials and supplies	7,500	Special accounts	550,000
Bills receivable and miscellaneous assets	62,500	Bills payable and miscellaneous liabilities	450,000
Reserve, sinking and special funds	452,000	Unfunded reserves	43,500
Cash	150,000	Surplus	28,500
	$7,072,000		$7,072,000
Composite of Seventeen Medium-Sized Companies—Freight Revenue More Than 20 Per Cent of Total Revenue:			
Property, plant and investment	$8,000,000	Securities	$6,750,000
Materials and supplies	9,500	Special accounts	925,000
Bills receivable and miscellaneous assets	50,000	Bills payable and miscellaneous liabilities	1,445,000
Reserve, sinking and special funds	1,120,000	Unfunded reserves	225,000
Cash	295,500	Surplus	130,000
	$9,475,000		$9,475,000

For a number of years the *McGraw Electric Railway Manual* furnished the most accurate and complete data on electric railways. This publication has not appeared since 1914. Unfortunately the reports of electric railways to the Interstate Commerce Commission are not published in detail, although they represent a considerable part of the industry and are more complete than some of the reports published by state commissions. In 1913 a total of 310 operating electric railways having total operating revenues of approximately $160,000,000 reported to the Interstate Commerce Commission. The Census Bureau in 1912 found 975 operating companies with operating revenues of $570,000,000.

For current reports the ELECTRIC RAILWAY JOURNAL and other publications devoted to this industry serve as the best sources, and information can also be obtained from the *Wall Street Journal, The Commercial and Financial Chronicle*, and other similar publications. All of the foregoing sources have been drawn upon for data for use in connection with the present studies.

QUESTIONS TO BE ANSWERED

While there is often much detail involved in making a study of a railway property, the customary method of procedure may be described as consisting of obtaining answers to the following questions:

1. What is the amount of the several classes of outstanding securities, and the order of their participation in the earnings of the company?
2. What is the amount of earnings available for return on the several issues of securities?
3. What is the margin of safety for each class of securities?
4. Is the situation showing improvement or otherwise?
5. What are the causes of the present situation and the apparent tendencies?
6. What can be done to correct unfavorable features?

The first three questions can be answered without difficulty from an examination of the usual published financial reports, but the others present difficulties which frequently cannot be overcome by means of information contained in published records.

THE ELECTRIC RAILWAY ACCOUNTING SYSTEM

Before examining into these various questions in the case of the three hypothetical interurban railways described above, it is desirable to review briefly the accounting system which is generally in use by electric railways, and which furnishes the basis of their records and reports. In every accounting department there are numberless details which must be taken care of, and many of the items which appear so clearly and definitely in the annual reports represent the results of whole series of special accounts which must be kept in considerable detail for the purpose of meeting the problems of management rather than from accounting necessity. For the present the records may be classified as (1) operating statistics and (2) financial data. The former consist of records of miles of track, car-miles, car-hours, number of passengers, tons of freight, ton-miles of freight, etc. The latter consist of the income account, profit and loss account, property and plant account, special accounts and balance sheet.

The income account represents the results of business for a given period, which in published statements is usually the fiscal year of the company. In it in more or less detail will be found the items listed in Table II.

The profit and loss account is provided for the purpose of adjusting gains and losses without affecting the income account in such a way as to render its use unreliable for comparative purposes. The principal items in the profit and loss account are as follows: (a) surplus or deficit at the beginning of the year; (b) surplus from operation during the year; (c) other credits arising from miscellaneous adjustments; (d) total credits; (e) deficit from operation during the year; (f) other debits arising from miscellaneous adjustments; (g) total debits, and (h) surplus or deficit at the end of the year. Some accountants carry net corporate income to item (b) of this account instead of bringing over surplus or deficit after dividends and other appropriations. They then include these items—dividends and appropriations—as additional debits in the profit and loss account.

The appropriations referred to may be of several sorts. Formerly accounts were set up and credited in this way for depreciation, accident, insurance and other reserves, but amounts for these items are now usually charged currently to operating expenses and placed in special funds which in turn are drawn upon for expenditures that otherwise would appear in operating expenses when and as made. Appropriations may also be made for the purpose of temporarily financing additions or betterments, pending more favorable conditions in the money market. It is not always possible to distinguish between appropriations of income as an item in the income account and a charge in the profit and loss account, or between additions to income and credits in the profit and loss account. Many accountants are, therefore, abandoning the separate profit and loss account and carrying adjustments directly to the income account.

The property and plant account contains in greatly varying detail the expenditures made for the various

Table VI—Cost of Electric Railway Tangible Property Per Mile of Single Track
(Average of Eighteen Urban Companies)

Item	Dollars per Mile of Single Track	Per Cent of Total— Average	Maximum*	Minimum*	Dollars of Tangible Property per Dollar of Operating Revenue per Year
(a) Land	$4,810	5.50	14.85	0	....
(b) Transmission and distribution	20,150	22.90	29.30	4.51	....
(c) Buildings and miscellaneous structures	12,170	13.85	15.32	0	....
(d) Plant equipment	15,450	17.60	50.00	0	....
(e) General equipment	14,460	16.45	30.53	0	....
(f) Roadway	20,800	23.70	75.00	11.82	....
Total	$87,840	100.00	....	....	4.71
(Average of Nine Interurban Companies)					
(a) Land	$2 060	5.48	10.42	0.83	....
(b) Transmission and distribution	6,950	18.47	29.50	8.48	....
(c) Buildings and miscellaneous structures	1,860	4.95	8.85	3.58	....
(d) Plant equipment	5,280	14.05	17.95	9.40	....
(e) General Equipment	4,420	11.75	15.25	8.15	....
(f) Roadway	17.100	45.30	61.20	38.60	....
Total	$37,670	100.00	....	....	7.28

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*The items below bear no relation to each other, as they are derived from different companies.

items of real and personal, tangible and intangible property, plant and equipment. It should show the cost at the first of the year, and the cost of property retired and the cost of that added during the year, and the resulting cumulative cost at the end of the year. Special fund accounts are not usually shown in detail in published reports, only the balance at the end of the year being carried into the balance sheet as of that date.

WHAT THE BALANCE SHEET CONTAINS

In its condensed form the balance sheet will appear somewhat as shown in Table V, and will give the status of the several accounts as of that date. It will be found upon examination of railway reports that a variety of items is included in the balance sheet and that frequently it is impossible to judge of the status of the business without an explanation of these entries. Under ordinary circumstances the income account is of greater usefulness than the balance sheet because it does not contain as many items which require special analysis. No attempt can be made at this time to discuss all of the items which will be found from time to time in the balance sheet, and references will be confined to five general classes of assets and liabilities.

The first balance sheet group on the asset side, property, plant and investments, represents the book value of the property and should contain all amounts expended for the tangible and intangible elements. The following items come under this classification: Railway physical property, non-operating property, franchises and securities owned. The last item is usually set out separately from those preceding, though frequently not in detail. The items which go to make up railway physical property will be found to be lacking from most published reports. Securities owned usually represent the amounts paid for securities and therefore give little assistance in judging the assets of the company. Those properties which have been built up by the purchase and combination of smaller ones frequently find it impossible to show in detail the items of property and plant of the companies taken over and therefore only totals are included, the purchase price becoming the book value. If this is the case only the first of the two following questions can be answered: (1) Is the cost of property and plant as shown in the balance sheet reasonable in view of the size of the property? (2) Which items, if any, appear to be out of line?

The classification of property as prescribed by the Interstate Commerce Commission contains fifty items grouped under four heads as follows:

I.	Way and structures	Accounts 501-529	(29 items)
II.	Equipment	Accounts 530-538	(9 items)
III.	Power	Accounts 539-544	(6 items)
IV.	General and miscellaneous	Accounts 545-550	(6 items)

Some of the state commissions have prescribed classifications which in most cases are in less detail than the one outlined above. The Wisconsin Railroad Commission in a number of valuation proceedings made public its findings in the following form of summary which follows the general divisions of that commission's classification of tangible property accounts: Land; transmission and distribution; buildings and miscellaneous structures; plant equipment; general equipment, and roadway. The results of the valuation referred to above are shown in Table VI, the various property values being shown in dollars per mile of single track so that the figures may be used comparatively.

Table VI-A deals with capitalization rather than with value of tangible property, but in itself it permits an interesting comparison between various industries.

The second general class of assets listed in the balance sheet is materials and supplies. Two questions naturally suggest themselves in connection with the figures shown under this heading: (1) Is the amount commensurate

Table VI-A—Relation Between Investment and Earnings in Electrical, Steam Railroad and Manufacturing Industries

	Investment Capitalization	Persons Employed	Annual Sales or Earnings	Investment— per Dollar Earnings	per Employee	Earnings per Employee
*Electrical Industries:**						
Central electric stations	$3,038,000.000	104.000	$403,300,000	$7.53	$29,200	$3,875
Isolated electric stations	1,519,300,000	52,000	201,600.000	7.53	29,200	3,870
Electric railways—power	5,363,600,000	330,000	701,000,000	7.60	16,140	2,125
Electrified steam roads	204,700,000	15,000	30,300,000	6.76	13,650	2,019
Telephone	1,262,760.000	237,000	329,900,000	3.84	5,320	1,390
Telegraph—land and marine	231,600,000	44,000	75,300,000	3.07	5,260	1,712
Electrical machinery	469.100,000	185,000	383,300,000	1.225	2,539	2,070
Electrical dealers	15,000,000	50,000	120,000,000	0.125	3,000	2,500
Electrical jobbers	25,000,000	6,000	80,000,000	0.313	4,170	13,340
Total electrical industries	$9,929.060.000	1,023,000	$2,324.700.000	$4.27	$9,680	$2,270
Manufacturers:†						
Total manufactures (1914)	$22,790,880,000	8,265,426	$24,246,323,000	$0.938	$2,755	$2,935
Automobile industry (1909)	173,837,111	75,721	249,202,075	0.697	2,293	3,291
Railroads:‡						
Total steam railroads (1915)	$15,703,081,000	1,506,433	$2,941,567,000	$5.33	$10,420	$1,954

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*From *Electrical World*, Sept. 2, 1916. †From United States Census. ‡From Interstate Commerce Commission reports.

TABLE VII—EARNINGS FOR A TYPICAL MANUFACTURING CONCERN

Amount available for interest and dividends	$120,000
Bonds: $1,000,000.	
Interest requirements at 5 per cent	50,000
Times interest earned—2.4	
Balance available for dividends	$70,000
Preferred stock: $200,000	
Dividend requirements at 7 per cent	$14,000
Including prior requirements	64,000
Times earned—1.88	
Balance available for common stock dividends	$56,000
Common stock: $800,000	
Dividend requirements at 6 per cent	$48,000
Including prior requirements	112,000
Times earned—1.07	

with the size of the property and the extent of its operations? (2) Is the figure shown taken from an inventory of material stocks or is it a storekeeper's balance?

The third item, bills receivable, includes all the miscellaneous amounts owed the company, either on account or on notes. The principal question in connection with these figures is as to whether or not these amounts can be collected. Bad debts should be written off currently through the profit and loss account, and the inclusion under this general heading of items which are not collectible serves to indicate a surplus not in accord with the facts.

Funded appropriations represent amounts set aside out of cash and represented by cash, certificates of deposit or securities. These funds are not often shown in such detail that judgment can be formed as to the company's ability to realize quickly the sums so shown. In these funded appropriations there should be included amounts set up for the purpose of making renewals of property. It is now generally considered good practice to invest a part of such funds in extensions to the property, but no information showing the amount of such reinvestment has been discovered in published reports.

The fifth item, cash, needs no comment. It represents those assets immediately available, but it must not be confused with the item of surplus on the liability side. The amount of cash is frequently less than the book surplus, but it may be greater where cash is being accumulated immediately prior to the payment of large sums for taxes, interest, etc.

The first item of the liability side of the balance sheet is securities issued. This should include all securities that have been issued and are outstanding, although some of them may have been reacquired by the company. The totals are usually shown separately for bonds and stock. The detail of the usual condensed balance sheet is insufficient to indicate the order of participation of the several securities in the earnings. The additional information necessary for this purpose will be discussed in a later paragraph.

The special accounts contain the credit balances in the various accounts which cannot be closed out currently. Unfunded appropriations or reserves are usually amounts set aside out of surplus for the purpose of meeting future expenditures for such items as taxes, interest and the replacement of property. It is well to note in any case how the amount of quick assets compares with the unfunded reserves.

Bills payable and surplus need no comment except that surplus is not surplus if the assets are overstated or the liabilities understated. While this observation is elementary, it is nevertheless overlooked often enough to justify its repetition.

EXAMINING THE OUTSTANDING SECURITIES

To return now to a more general survey of the situation, the first question to be answered relates to the outstanding securities. Table VII shows for a typical manufacturing concern the securities, the amount of earnings available for meeting the requirements of the several issues, and the margin of security afforded for each, thus covering questions 2 and 3 as well as question 1. For this assumed case, which represents a moderately successful manufacturing company, it appears that there is in earnings an ample margin over the requirements of bond interest, and that the preferred stock would not suffer unless the earnings decreased by nearly one-half. A decrease in earnings of more than 7 per cent, however, would encroach upon the common stock requirements. Data for the three hypothetical interurban railways, similar to those given in Table VII, are presented in Table VIII.

FINDING OUT WHETHER THE SITUATION IS IMPROVING

The fourth question may now be considered: Is the situation showing improvement or otherwise? The single test usually used is a comparison for a number of years of the margin of earnings over interest and dividend requirements. This test is necessary but not sufficient. In addition, it is essential to know whether the amounts shown as net earnings are really earned; that is, whether they are over and above all costs of operation, including proper maintenance charges, an adequate accumulation of funds for making renewals and a sufficient provision for the amortization of bond discount, cost of limited term franchises and other expenditures which should not be carried permanently in capital account. To determine these facts requires the making of engineering and accounting examinations and the drawing of conclusions embodying the soundest judgment available.

If time and opportunity for such procedure are lacking, recourse may be had to ratios which may be determined from the usual published reports. The three

TABLE VIII—INTEREST AND DIVIDENDS OF INTERURBAN RAILWAYS
(Participation in earnings of various security issues)

Item	Composite of Six Large Interurban Companies		Composite of 128 Medium-sized Companies—Freight Revenue Less than 20% of Total Revenue		Composite of Seventeen Medium-sized Companies—Freight Revenue More than 20% of Total Revenue	
Amount available for interest and dividends	......	$793,990	......	$200,400	......	$154,890
Bonds outstanding:	$21,600,000	......	$3,000,000	......	$3,450,000	......
Interest requirements	4.7%	1,015,200	4.65%	139,500	5%	172,500
Times interest earned	0.78	......	1.5	......	0.90	......
Balance available for dividends	......	......	......	60,900	......	......
Preferred stock:	3,900,000	......	1,000,000	......	1,150,000	......
Dividend requirements	5.8%	1,241,200	......	194,500	......	235,750
Including prior requirements	......	226,000	5.5%	55,000	5.5%	63,250
Times earned	0.64	......	1.07	......	0.66	......
Balance available for common stock dividends	......	......	......	5,940	......	......
Common stock:	17,500,000	......	2,000,000	......	2,150,000	......
Dividend requirements	......	......	......	......	......	......
Including prior requirements	......	......	......	......	......	......
Times earned:	......	......	......	......	......	......
Bond interest earned	3.5%	......	4.65%	......	4.8%	......
Preferred stock dividend earned	None	......	5.5%	......	None	......
Common stock dividend earned	None	......	0.3%	......	None	......

units most commonly used are: (1) capitalization per mile of track. (2) Gross revenue per mile of track per year. (3) Operating expenses (including taxes and depreciation) per mile of track per year. The first two may be combined to give (4) gross revenue per year per dollar of capitalization, and the third and fourth to give (5) net revenue per year per dollar of capitalization.

If (4) gross revenue per year per dollar of capitalization is remaining constant or decreasing, an unhealthy condition of affairs is indicated, as it means that the investment cost per dollar of new business is increasing. If (5) net revenue per year per dollar of capitalization is increasing it may mean (a) the addition of more profitable business, (b) the increase of efficiency in operation, or (c) a decrease in charges for maintenance, renewals and depreciation. The first two results are highly favorable indications, but the third is not to be accepted as favorable without further examination to determine whether the decreased charges are caused by more efficient maintenance or by a lower standard of maintenance.

The usual way to form an opinion on this matter is to separate operating expenses into two groups: (1) Conducting transportation, general and miscellaneous expenses, and taxes; and (2) maintenance, renewals and depreciation charges. It is a fairly safe assumption that any material decrease in the second item indicates a lowering of maintenance standards, although since many of these costs may be postponed temporarily without great harm it is well to make the test by measuring maintenance, renewals and depreciation charges in terms of gross revenue and comparing the annual ratios of percentages over a period of several years.

In Tables IX and X are given values for the several items referred to above for the three hypothetical interurban railways already mentioned, for all electric railways reporting for the 1912 census, and for a group of important steam railroads, the data for which were taken from various reports of companies to the Interstate Commerce Commission.

The use of figures for the year ended June 30, 1915, is not satisfactory, as that period was less favorable for many companies than the average of several years preceding. Both 1916 and 1917 will show better results for the majority of companies. The figures cited, however, are only for purposes of illustration, and will not be assumed to represent other than average values for the periods to which they refer.

THE CAUSES AND THE TENDENCIES

This brings the investigator to the fifth general question—the causes of the present situation and its apparent tendencies. Here the investigator finds less help from the published reports, although some indication of the answers to the following questions will be found therein. It is pertinent to inquire first as to the revenues. Are they what they should be? A clearer idea of the situation will be obtained if the following questions are answered:

TABLE X—APPORTIONMENT OF OPERATING EXPENSES—COSTS PER MILE OF SINGLE TRACK

	Conducting Transportation, General Expenses and Taxes		Maintenance, Renewals and Depreciation	
	Per Mile of Single Track	Per Dollar of Operating Revenue	Per Mile of Single Track	Per Dollar of Operating Revenue
Composite of six large interurban companies	$3,470	$0.488	$1,480	$0.207
Composite of 128 medium-sized interurban companies — freight revenue less than 20 per cent cent of total revenue	4,050	0.526	1,460	0.188
Composite of seventeen medium-sized interurban companies —freight revenue more than 20 per cent of total revenue	2,640	0.487	1,120	0.206
Electric railways (composite of all operating companies):				
1902	6,090	0.492	1,340	0.122
1907	6,200	0.490	1,750	0.143
1912	7,030	0.497	2,100	0.152
Steam railroads (composite of six representative companies):				
1912	4,080	0.437	3,030	0.281
1915	4,470	0.426	3,020	0.295

1. What is the passenger revenue per passenger car-mile?
2. What is the freight revenue per freight car-mile?
3. What part of the total revenue comes from freight?
4. What are the transportation revenues per mile of track?
5. What is the passenger revenue per passenger-mile?
6. What is the freight revenue per ton-mile?
7. What is the revenue per thousand population served; and
8. Is the situation in respect to the seven preceding items improving or not?

As to operating expenses, the following questions may be asked:

1. What are the operating expenses per dollar of operating revenue?
2. What are the transportation costs per car-mile?
3. What are the equipment maintenance costs per car-mile?
4. What are the maintenance-of-way costs per track-mile?
5. What are the general and miscellaneous costs per dollar of other operating expenses?
6. What is the average speed of cars?
7. What is the number of car-miles per mile of track per year?
8. What is the average annual mileage per car?

TABLE IX—COMPARATIVE UNITS OF OPERATION AND CAPITALIZATION

	Capitalization per Mile of Track	Gross Revenue per Mile of Track	Operating Expenses (Including Taxes and Depreciation) per Mile of Single Track	Gross Revenue per Dollar of Capitalization	Net Revenue per Dollar of Capitalization
Composite of six large interurban companies	$90,300	$7,750	$4,950	$0.0858	$0.0350
Composite of 128 medium-sized interurban companies—freight revenue less than 20 per cent of total revenue	66,800	8,220	5,510	0.1232	0.0592
Composite of seventeen medium-sized interurban companies—freight revenue more than 20 per cent of total revenue	75,200	5,600	3,760	0.0744	0.0278
Electric railways:					
1902	96,287	11,640	7,430	0.1209	0.0481
1907	100,495	12,610	7,950	0.1255	0.0489
1912	104,930	14,500	9,130	0.1383	0.0581
Steam railroads:					
1912	56,500	10,100	7,110	0.1786	0.0586
1915	56,200	10,240	7,490	0.1823	0.0482

These questions are but a few of those suggested by an examination of the report of an interurban electric railway. Neither the extent of information which can be obtained in this way nor its pertinence can be foretold, and frequently the investigator will meet with but slight success in attempting to reach conclusions by this method. There is, however, much to be learned in this way if one is willing and able to recognize negative results—that is, that the figures prove nothing. Average values for certain of the foregoing items are shown in Table XI.

One most important item will frequently be obtained only with difficulty, *viz.*, the relative profitableness of the various classes of freight and passenger business, since the classification of accounts does not lend itself readily to the determination of these costs. The advent of regulation of rates on the cost basis makes such determination of increasing importance, as it is no longer considered a justification of any individual rate that the combined revenue from all rates is approximately what it should be. In every case it is of great importance to know the tendency of the units and ratios suggested above, and it is only by examining these suggested details that the causes of the tendencies shown in the corporate income account can be known.

TABLE XI—COMPARATIVE UNIT COSTS FOR INTERURBAN RAILWAYS

	Composite of Six Large Interurban Companies	Composite of 128 Medium-Sized Companies—Freight Revenue Less than 20 Per Cent of Total Revenue	Composite of Seventeen Medium-Sized Companies—Freight Revenue More than 20 Per Cent of Total Revenue	Steam Road Composite of Six Companies
Passenger revenue per passenger car-mile	$0.303	$0.214	$0.297	$0.208
Freight revenue per freight car-mile	0.250	0.367	0.296	0.105
Per cent of freight revenue to total revenue	13.1%	7.9%	29.4%	67.2%
Transportation revenue per mile of single track	$6,820.00	$7,440.00	$5,270.00	$9,900.00
Passenger revenue per passenger mile	....	....	....	0.0193
Freight revenue per ton mile	....	....	....	0.0073
Operating expenses per dollar of operating revenue	0.650	0.647	0.643	0.693
Transportation costs per car-mile	0.1006	0.0838	0.1003	0.0450
Equipment maintenance per car-mile	0.0268	0.0179	0.0284	0.0227
Maintenance of way per mile of single track	848.00	842.00	647.00	1,265.00
General and miscellaneous expenses per dollar of operating expense	0.1525	0.1365	0.1620	....*
Average speed of cars (miles per hour)	13.05	10.25	6.78	....
Car-miles per mile of single track	23,500	33,350	16,950	77,800
Miles per car per year—total	17,750	27,700	5,330	10,010
Passenger	37,700	33,700	24,250	58,600
Freight	4,610	5,750	2,140	8,650

*Cannot be obtained on a comparable basis.

It should be emphasized that efficiency of management cannot be judged by this means alone. No class of men can come nearer to working miracles than the railway operators of to-day, but they must work with conditions as they find them. Results cannot be more uniform than conditions, nor can there be earnings without traffic.

One is tempted, in examining the unit costs disclosed by answers to the preceding questions, to compare them with similar units determined from the records of other properties. Such procedure is not particularly profitable, although it will result in fixing attention on items which show some divergence. For example, wages of trainmen per car-mile may appear to be substantially the same for two companies, one operating in the intermountain region and the other in the South Atlantic district, and so pass with little notice. At least three factors are involved here, each of which must be known before the suggestion of equal efficiency of operation can be accepted. These are (a) the hourly rate of wages, (b) the speed of cars and (c) the number of trainmen per car. It is because of the complexity of the problem that attempts to decide as to the efficiency of operation and the soundness of the business on the basis of published reports alone are distinctly hazardous. In addition, average or normal revenues and costs mean very little. The road with the highest earnings is not content until it has bettered its own record, and the road with the lowest costs will likewise attempt to make them lower still. But while there is and can be no absolute standard, comparative figures frequently suggest the line of investigation which yields the answer to the question, "What are the causes of the present situation?"

WHAT REMEDY CAN BE USED

The sixth question, "What can be done to correct unfavorable features?" cannot be answered from data contained in published reports. Only careful study by capable men can result in the best plans for the future. It is possible, however, to obtain some idea as to the likelihood of improvements from examining the following points:

1. Is the revenue received for present business at a rate above or below the average?
2. Is the present cost of operation above or below the average cost?
3. Does the present volume of traffic appear to be normal for the communities served?
4. Do the communities served appear to be developing so as to furnish more business in the future?

The first two questions dealing with operating revenue and operating expenses may be answered by expressing revenues and expenses in terms of car-miles. When the transportation of freight is involved the revenue per passenger car-mile and that per freight car-mile should be shown separately, and by a proper allocation of direct charges and apportionment of common charges, the costs of freight and passenger business should be determined. This will permit of an examination of net earnings as well as gross, and will indicate, when the scale of rates is compared with those of other companies, something as to the relative profitableness of the various lines.

The third and fourth questions refer to what is probably the most important single factor in judging the future. It cannot be determined from the ordinary published records, or in every case from direct examination of the property. This factor will be termed "development" and defined as the relation of present business to possible future business. Stated more definitely, the important thing is the relation between the ratio of gross revenue to investment to-day and the possible future ratio of gross revenue to investment. The bonds of a property which earns twice its fixed charges in a fully developed field may be less desirable than those of a company which now earns only a little more than its fixed charges, but which operates in a field which is under-developed and capable of large expansion. This one ratio, that of investment per dollar of gross revenue together with the knowledge of possible development as above defined, will tell more about the worth—that is the soundness of any property—than volumes of unit costs will. Is the field a potential market of importance? If not, the industry is likely to be unsound, even though the present earnings may be sufficient to pay a profit.

Present-day inefficiency in operating may be corrected by painstaking care, and potential markets may be developed by wise and persistent effort, but the field must have possibilities or the future can yield nothing but disappointment. It may be urged that the utility which has attached the most business to itself is penalized on this basis by comparison with one less fully developed; but if it has been developed at a capital expenditure such as to maintain at its original value the ratio of the investment to gross earnings, then it is not so attractive a property as one which has possibilities of growth before it.

For National Defense

General Harries Explains How the Electric Railways Can Help

TELEGRAM (WESTERN UNION)

E. B. BURRITT, OMAHA, NEB., Feb. 7, 1917.
Secretary, American Electric Railway Association.
NEW YORK.

Responding to your telegram this date I would say that the most important field of usefulness of electric railways in the matter of aiding in national defense is in connection with transportation of men and material from and to standard steam lines to our coast artillery posts. Of course there will be other opportunities for co-operation in connection with transportation to and from mobilization camps throughout the country, these latter, however, almost invariably as distributers to and from standard steam roads.

The first thing of value which can be done by the electric railways will be to contribute promptly and fully all information called for by the Committee on Co-operation with the War Department. Without the necessary data it will be impossible to create any workable plan.

The problem of effective partnership between the steam and electric roads will be by no means capable of easy solution. The desire of the association's committees is to find out how many electric roads are in shape to handle without breaking bulk the heavy material which may be conveyed to junction points by steam and how many others there are which could be rapidly made fit for such service. Motive power, track curvature, clearances and bridges have to be primarily considered. In the many cases where electric roads will be unable to handle steam rolling stock we must be informed as to the usable equipment which can be depended upon, so that there will be no guesswork as to the number of troops or the tonnage of supplies that could be successfully handled in the shortest practicable period of time.

To attempt to set forth just now the questions which the committee may find it necessary to ask is neither practicable nor necessary. Every operating official can easily visualize the situation and will appreciate the difficulties which with the assistance of the federal government may have to be met and overcome.

Very few of our coast defense posts are without electric railway connection with near-by towns. Very few of these posts have anything like direct steam connection. What we therefore desire to know is the physical relationship of steam and electric carriers, the ability or inability of the several electric roads to maintain effective transportation communication with steam roads and then we must have the facts as to the manner in which men and supplies can be handled either regularly or in time of emergency.

The best service which can now be rendered by member companies will be the speediest possible reply to any inquiries sent out by the committee and by volunteering such suggestions or information as will be calculated to assist the committee in doing its work.

GEORGE H. HARRIES,
Chairman of Committee on Co-operation with the War Department.

Temporary Relief for Boston Elevated

Special Commission Recommends Sale of Cambridge Subway to State, Graduated Rental for Dorchester Tunnel, Reduction in Compensation Tax, Increase of Prepayment Areas and Other Measures to Relieve Present Situation—Fare Increase or Transfer Charge Is Not Favored Now, but Further Investigation of the Company's Administration Is Recommended

THE SPECIAL RECESS COMMISSION now reporting to the Massachusetts Legislature on the financial condition of the Boston Elevated Railway was organized about the middle of 1916 by legislative resolution as a result of the railway's plea for relief. The commission was composed of the Lieutenant-Governor of the State as chairman, the President of the Senate, the Speaker of the House, two members of the Senate, four members of the House, and the full boards of the Public Service Commission and the Boston Transit Commission.

After long and careful consideration of the company's brief, abstracted in the ELECTRIC RAILWAY JOURNAL of Sept. 30, the commission has recommended that the Legislature grant certain measures of relief which do not involve any direct burden on the public, as described below. The commission considered the question of a fare increase but noted certain objections to it and recommended that action in this matter be deferred for the present. It suggested that the Public Service Commission investigate and report by Feb. 1, 1918, upon the company's efficiency of management and that the Boston Transit Commission should report at the same time upon the prospective rapid transit needs for the next decade. [EDITORS]

IN an exhaustive report dated Feb. 1 the special legislative commission investigating the financial needs of the Boston (Mass.) Elevated Railway recommends various measures for the temporary relief of the company and advocates an additional investigation during the coming year by the Massachusetts Public Service Commission of the general efficiency of the road's administration. As has been forecasted in this journal, the company's suggestions relative to fare increase and transfer charges are not favored by the commission at this time. The sale of the Cambridge subway to the State and certain reductions in taxation burden, however, are favored as the means of providing the company with funds which cannot now be obtained on account of its inability to issue further securities.

The commission points out that the company cannot issue additional necessary capital for the equipment of the tunnels and rapid transit lines now in the course of construction and for other improvements required. The floating debt of the company on Jan. 17, 1917, was $3,260,000. To raise by short-term loans the amount of additional capital which will be urgently needed within the near future would probably be impossible. Even if it were done, it would probably be at excessive cost and would leave the company at the mercy of changing financial conditions. The commission emphasizes the vital need for new capital if the community served is not to stagnate, and holds it probable that from $5,000,000 to $7,000,000 new capital will be needed in the near future for rapid transit line improvements alone. This does not include additions and improvements to the surface system or new subways and tunnels.

While the company would not have to pay for these latter structures, the report points out that it cannot be expected to lease them upon terms which would further imperil its ability to earn a fair return for its stockholders. The situation, whatever its causes may be, is said to be one which calls for definite action in the public interest.

The commission states that there is no "water" in the capitalization of the system, and that the return received by the stockholders has not been excessive. Furthermore, it states that the evidence justifies the conclusion that the company has endeavored in a spirit of co-operation to meet the demands of the public for rapid transit facilities, although the cost has been far greater than anyone would have ventured to predict when the company was organized; that the facilities now offered are immeasurably superior to those formerly enjoyed, and that the company has, especially within the last few years, been subjected to heavy additional burdens. Not only have the stockholders not of late received a fair return upon their actual cash investment, but this return is likely to decrease in the immediate future. The present stoppage of new capital will, unless the impediments are in some way removed, create at no distant date intolerable transportation conditions within the metropolitan district.

RELIEF NOT IMPOSING ADDITIONAL BURDEN UPON PUBLIC

The commission recommends without hesitation all the proposed measures of relief which do not impose an additional burden upon the public. The first of these is the return of the $500,000 guarantee fund deposited with the State at the time of the company's organization. Second is the purchase of the Cambridge subway by the State, which the commission favors rather than its purchase by a municipality outside of Boston. The cost of the Cambridge subway proper, exclusive of the Boston underground connection, was about $9,000,000. This sale would provide the company with additional capital at a lower cost than by the issuance of its own securities, if this could now be done. It would not reduce existing charges, because the cost of the Cambridge subway is represented by outstanding capital which could with difficulty be retired. It would merely provide the company with new capital at a lower rate of interest. The commission recommends instalment payments to the company under the direction of the Public Service Commission, and urges that authority be given the company to make loans or advances to the West End Street Railway from the money received to provide the latter with capital.

In regard to the enormous cost of subways and tunnels in comparison with ordinary facilities for surface transportation, the report points out that while such structures, if operated with a train service, with stops not too close together and with a dense traffic, and if accompanied by a corresponding decrease of surface car mileage run, do make possible a material decrease in operating cost, much time elapses before traffic can be adjusted to the new routes and the full saving realized. Furthermore, it is always desirable to build subways with an eye to the future and to provide a capacity much greater than would be required during the first few years of operation.

In view of this, the report states, the suggestion that the company be relieved, during the early years of operation of a subway, of a certain portion or the whole of the rental, making these amounts up in subsequent years, with interest, is entitled to consideration. Under the present practice on a certain day a subway is not in operation and no rental is being paid for it. On the very next day it is put in service, and the full amount of the rental begins to accrue, although the traffic which it carries at the beginning is for the most part not new traffic but business diverted from other lines. There is no sudden increase in the total traffic of the system. The burden thus imposed is very great. When the Dorchester tunnel, for example, is opened, the company will immediately become subject to a rental of about $441,000 per year, equal to nearly 2 per cent on its capital stock. The commission is strongly inclined to the belief that in leases of future subways it would be wise to arrange a graduated rental, with provision for ultimate full compensation including interest.

This simply means, if the initial rental is less than the interest charges paid by the city, charging the cost of the subway with not only the interest during construction but the interest, or a portion thereof, during the early years of operation. The report points out that it is universally the practice and sound financially to charge interest during construction to the capital account, for it is as much a part of the cost of the work as money spent for steel, concrete or engineering services. It is only a step further and merely a difference in degree to charge to capital some part of the interest during the period before the work is self-supporting. The principle has in effect been recognized by the Massachusetts Legislature in allowing the use, without rental charge, of a portion of the Dorchester tunnel in advance of the completion of the whole. In industrial financing it is frequently necessary to pay some portion of interest out of the capital account after the work has been put into service. Many undertakings, the report states, could not be carried out unless this were done, for few or no properties, unless financed largely by stock issues, can fully earn fixed charges immediately upon being put into use. The commission recommends that a gradual rental be allowed for the Dorchester tunnel either by application of proceeds from the sale of the Cambridge subway or proceeds of bonds to be issued by the company in excess of the present legal limit, subject to the regulation of the Public Service Commission and with a graduated period not exceeding three years from the tunnel opening.

TEMPORARY CAPITALIZATION OF REPLACEMENTS

If it were not for the present abnormal level of equipment prices, probably $3,000,000 or $4,000,000 could be spent immediately to good advantage by the company in buying additional rolling stock and substituting new cars for old. There is reason to believe that the resulting saving in operating expenses would cover the interest on the investment and also amortize the cost of the abandoned cars within a short period of years. Even with cars at their present prices, the report says, a substantial investment of this nature is distinctly desirable. If the company had a depreciation fund large enough for such replacements, its position would be very favorable, but on June 30, 1916, only $444,263 was in this fund, an amount insufficient for the purpose. Under Chapter 671 of the Acts of 1914 street railways may, with the approval of the Public Service Commission, issue bonds beyond the ordinary limit to fund the cost of replacing or reconstructing their property, provided they are retired from earnings within ten years. The Boston Elevated Railway cannot take advantage of this statute with respect to surface cars, as these belong to the leased West End company. The commission recommends that a portion of the funds received from the sale of the Cambridge subway be authorized for the purchase of new equipment, or that rehabilitation bonds be permitted. On account of the high price of equipment a fifteen-year period is recommended, subject to the approval of the Public Service Commission.

CONSTRUCTION OF PREPAYMENT AREAS

If additional inclosed areas can be provided at important transfer points so that paper transfers may thereby be eliminated, the total volume of transfers will be so reduced that an effective auditing system may be introduced. This is in the public interest, in the opinion of the commission, and the report recommends that the company be given the right of eminent domain to take private property for such transfer areas, with approval of the Public Service Commission. When such areas legitimately form a part of a subway line, they should be constructed subject to the approval of the Boston Transit Commission, and the cost of their construction charged to the cost of the subway.

MEASURES IMPOSING ADDITIONAL BURDEN ON PUBLIC

The foregoing measures will, if adopted, make it possible for the company to obtain, at a low rate of interest, all the capital needed within at least the next three years, and for the most part would be desirable and in the general interest were the company prosperous. These measures, however, will not in the immediate future effect any permanent improvement in the position of the company's stockholders. It has been strongly urged that some more fundamental and more positive form of relief should be provided for in the way of further contributions from the public to the company to the end that transportation development in the Metropolitan district may in no way be imperilled. Two general methods exist for accomplishing this. First, remission, either temporary or permanent, of taxes or other similar burdens placed upon the company; and, second, an increase in the rate of fare.

ABOLITION OF THE COMPENSATION TAX

This tax consists of seven-eighths of 1 per cent of the gross earnings of the company, with the proviso that if the company pays dividends in excess of 6 per cent a sum equal to such excess shall be paid as a part of the compensation tax, in addition to the percentage of gross earnings. This amounted to $160,786 in 1916. The report states that when the stock of a public utility is worth less in the market than the amount of its cash investment, as is the case in Boston, the franchise value has for the time being ceased to exist. The company has agreed to assume additional heavy expenses for paving and street surface maintenance. The commission recommends that the compensation tax of seven-eighths of 1 per cent of gross earnings be abolished, but that the provision of the statute requiring a sharing with the public of dividends above 6 per cent remain in force.

THE PROBLEM OF INCREASED FARES

A fare increase, introduction of a zone system or transfer charge, it is said, would violate the company's contract with the State. The commission is of the opinion that a fare increase would probably not produce additional net revenue in proportion to the increase. Furthermore, a zone system would be impracticable. Such a system would require an interior zone of about 4.75 miles from the urban center, with one or more outer zones. It would be necessary to include the terminals of the rapid transit lines within the interior zone, as the expense and inconvenience of attempting to collect additional fares on rapid transit trains would render such collection impracticable. Moreover, the zone system would be open to the objection that the territory served by the company has been developed, values have been fixed and homes established on the basis of a uniform fare.

The suggested charge for transfers appears difficult in application to Boston. The arrangement of the system requires a transfer in the vast majority of rides. A penny charge for a transfer at such points as Park Street, Dudley Street, Sullivan Square, etc., would assume the character of a 6-cent fare upon the entire system or else would throw a burden upon the surface lines which they are not adapted to bear. There appears no reason to recommend a transfer charge on the surface system at this time, in view of the fact that transfers are frequently given, not to increase the length of ride, but, for the sake of economy, to avoid the running of through cars.

FURTHER REMISSION OF TAXES

The commission investigated at considerable length a plan for the remission of the company's so-called franchise tax (amounting in 1916 to $403,149), under the general supervision of the Public Service Commission. It recognizes that every city gains largely, financially and otherwise, by every extension of its transportation facilities, and particularly by the construction of rapid-transit lines. This consideration may justify a municipality in bearing some share of the cost of providing these traffic facilities, as in New York and Philadelphia. Nevertheless, while the plan devised by the committee of the commission for making good possible future deficiencies in earnings by a temporary remission of taxes has favorably impressed many of the commission, the latter concludes after careful study that action along these lines is not desirable at present.

FURTHER INVESTIGATION NECESSARY

The report states that a more thorough investigation of the company is required than time has so far permitted, before the adoption of any relief measures in the way of further taxation reduction or fare increase. It must be shown that the necessary revenue cannot be secured by further gains in operating efficiency, including improvements in equipment and in methods of car operation, the reduction of relative operating cost through the diversion of traffic to rapid transit lines, etc. Under present abnormal conditions, traffic and earnings are increasing at present more rapidly than ever before in the history of the company and at a rate faster than that on which its forecast of future financial results was based. Positive knowledge of the financial conditions of the future is not available, however, and the commission feels that more adequate information as to the probable outlook is needed. It is also advisable that a thorough investigation be made to determine whether the company can increase its net earnings through more efficient or economical methods of management and operation. Supplementing this investigation may properly come a parallel investigation of the desirable development of transit facilities during the next decade. The commission recommends that the efficiency investigation be conducted by the Public Service Commission and the transit development investigation by the Boston Transit Commission, both to report to the 1918 Legislature by Feb. 1 next.

In deferring definite action upon the more radical measures for relief, the commission feels that no sacrifice of the public interest is in any way involved. The minor measures of relief recommended will relieve the present stoppage of capital supply and will enable the company to complete the work to which it is already committed, and to make the additional improvements which are in its own and the public's interest. At the end of another year it will be possible to determine what further action, if any, is desirable in the public interest, the conditions upon which it should be based and the safeguards by which it should be surrounded.

PRESIDENT BRUSH'S COMMENTS

Commenting upon the report of the commission, President Brush said:

"The measures proposed by the commission will temporarily, at least, and to some extent, put the company in a better position to meet the demands of the public. The company is gratified that the members of the special commission are unanimously of the opinion that the company should have some financial relief. In view, however, of the increase in the cost of labor and materials and the enormous cost of additional rapid transit facilities, the company is firmly convinced that it will be necessary either that the communities bear a portion of the burden of additional rapid transit facilities, as is now done in New York and is proposed in Philadelphia, or else that there be an increase in fares.

"We understand that the possibility of this is recognized by the members of the special commission in view of the fact that they have referred the question of further relief to the Public Service Commission for further investigation and recommendation and the question of additional rapid transit facilities to the Boston Transit Commission. It scarcely seems necessary to state that in so far as any measures adopted by the Legislature will enable it to do so, the company will promptly avail itself of the means afforded to buy additional cars and otherwise to improve and extend its service."

Cedar Pole Market Steady

Northern White Cedar Association Discusses Business of Past Year

The twenty-first annual meeting of the Northern White Cedar Association was held at the Radisson Hotel, Minneapolis, Minn., Tuesday and Wednesday of this week. It was attended by about fifty representatives of the leading pole producers of the country. No set papers were read, the sessions being devoted to discussions regarding the economical production and sale of cedar poles.

In his annual address the president, H. L. Partridge, stated that one of the most important features of the work done during the year was the advertising campaign that had been conducted through the technical papers. The anticipated volume of business had not been realized during the year 1916, but this was due to the unsatisfactory condition of the metal market which held up temporarily the big construction work that is contemplated. Other speakers discussed the subjects of insurance and of surplus stock, attention being called to the fact that the year's shipments of 20-ft. poles closely approximated the average sales for the five years preceding, and that poles 25 ft. and longer were but 35,000 less than the same average. Emphasis was laid upon the necessity of being able to furnish, at close intervals, inventories in order that production and consumption demands could be more accurately gaged.

At the election of officers for the ensuing year J. C. Kirkpatrick of Escanaba, Mich., was made president; J. E. Gerich, vice-president; and L. A. Furlong and T. M. Partridge, directors. W. B. Thomas was continued as treasurer, and N. E. Boucher as secretary.

Strike Restriction Plan Opposed

Labor Will Fight Plan of New York Commission or Any Bill to Prevent Strikes—Utility Managers Say Plan Will Not Be Effective

During this week the Public Service Commission for the First District of New York has been conducting a series of hearings on its tentative plan for restricting strikes on electric railways in New York City. The full text of this plan was published in the ELECTRIC RAILWAY JOURNAL of Jan. 27. Thus far the hearings, which will be continued next week, have served only to develop the fact that public representatives are inclined to look favorably upon the plan as a proper protection of the paramount right of the public to continuity of service, but that organized labor is unqualifiedly opposed to any wage system or strike-prevention scheme that is not based upon the entirely voluntary act of employer and employee. As for the utilities concerned, these doubt the possibility of success for the proposed plan and prefer to be left to adjust matters with their employees without interference from outside parties.

In opening the hearings on Feb. 6, Oscar S. Straus, chairman of the commission, explained the plan and laid particular emphasis upon the provision for a wage board, composed half and half of company representatives and employees. He thought that such a board would settle disputed questions regarding wages, hours and working conditions without the bitterness that usually arises when the company and the main body of employees reach the crucial point in their direct negotiations. The question as to whether there should be one wage board for the entire State or one for each railway system had been left open, Chairman Straus said, and no opinion on this would be formed until all parties had been heard.

The speakers at the first hearing were Albert Shaw, editor *The Review of Reviews*, and Delos F. Wilcox, franchise expert, New York, N. Y. Mr. Shaw, after explaining the growth of public interest in municipal transportation, said that the plan suggested seemed fair to employees and they should be willing to accept it. Mr. Wilcox stated that the wage-board representatives of the unorganized men should be selected by the commission, so that the company with its half membership on the wage-board might not easily control the board through the unorganized men. He also thought that there should be provision for appeal by either side to the commission, if the finding of the wage board was not unanimous.

During the colloquy with Mr. Wilcox, Chairman Straus explained that the plan is not claimed to be an absolute preventive of strikes but that it will restrict them to only a very small percentage of cases. The plan provides that no strike shall be instituted pending the decision of the wage board or commission, and after such finding is made the employees would be in honor bound by a previously required consent to abide by any decision reached. Should they repudiate this consent and strike, the act would not be considered a penal offense but they would be subject to the force of public opinion and would have no further standing before the commission.

At the hearing on Feb. 7 the only speaker was Samuel Gompers, president American Federation of Labor, who vehemently opposed any legislative action for the restriction of strikes. He admitted that he would favor the commission's plan if it were voluntarily adopted by employers and men, but said that no legal restrictions would be of any avail in prohibiting employees from quitting work if they so desired. Mr. Gompers averred that no strike-prevention laws anywhere in the world had accomplished their stated purpose. He denied that machinery set up according to the commission's plan would have provided the benefits that were secured by workers in the past through strikes and arbitration compromises. In closing he stated the general position of organized labor in these words:

"We will oppose the proposal step by step and will not yield one inch in opposing it during all its progress. We will fight it in the courts, and, if beaten there, we will exercise our God-given natural right, the law notwithstanding. You may make us lawbreakers possibly, but you are not going to make us slaves."

The hearing on Feb. 8 was given up to utility representatives. E. A. Maher, Sr., president Third Avenue Railway, stated that he personally was in favor of collective bargaining, but that he did not believe in bringing outside interests into the question, *i.e.*, foreign labor leaders and others not interested in railway operation, as are the companies and the commission. He told how his company expects to broaden the scope of its employees' mutual benefit association so the employees can take all questions up with the management and reach an adjustment. Mr. Maher said that the wage-board plan would not prove successful unless the decision of the board were final, for the employees would insist on an appeal in every case. Moreover, he felt that the matter of wages would better be left entirely to the company, and the commission from its records could easily check the company's veracity if it asserted at any time that it could not afford to pay higher wages.

John Beaver, receiver Second Avenue Railroad, thought that employees would strike, law or no law, if they so desired. T. S. Williams, president Brooklyn Rapid Transit Company, was not able to attend the hearing, but he stated in a communication that the plan of the commission would result only in unrest and dissatisfaction, for it did not presuppose a natural and spontaneous co-operation between management and men but tried to create concord by legislative fiat. Had the proposed plan been in effect last summer at the time of the metropolitan strike, Mr. Williams said, the company could not have maintained such peaceful relations with its men as it did simply through its policy of intelligent and fair co-operation.

In a similar communication T. P. Shonts, president Interborough Rapid Transit Company and New York Railways, stated that he believed in the right of the public to continuous service, the right of collective bargaining, the right to use contracts of service, the right to prohibit strikes pending investigation, the right of the company to maintain discipline and the right of individual employees to leave the service before the end of their contracts with the consent of the company or at the order of the commission. He thought, however, that collective bargaining through the company's internal brotherhood was more in the public interest and the employees' interest than bargaining through outside unions. Furthermore, he did not believe that the commission should control wages, hours and working conditions, for it would be both public prosecutor and judge in any case. The adjustment of grievances, he thought, should be left entirely to the company and the employees' organization. In regard to stopping work, Mr. Shonts suggested that if any considerable number of employees give written notice to quit or to demand changed conditions or wages, or if the employer gives written notice of an intention to change wages or conditions, the Public Service Commission should forthwith ask the Appellate Division to appoint three arbitrators to determine the controversy, the commission to appear on behalf of the public. The decision, when confirmed, should be binding for a period of from one to three years, and severe penalties should be inflicted upon the side disregarding the finding.

COMMUNICATIONS

Reuse of Existing Rail

AMERICAN RAILWAYS COMPANY
PHILADELPHIA, PA., Jan. 31, 1917.

To the Editors:

I wish to emphasize, if possible, the importance of the matter covered in the article by M. E. Stark, appearing in the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 13, page 80, under the caption "Prolonging the Life of Old Rail." In this article he took up the possibilities of reusing existing rail in track reconstruction.

At the present time many small properties find it impossible to get new rail at any price, and Mr. Stark's article opens up a line of thought which cannot but be advantageous even to larger railways. We are undoubtedly required to do a great deal of work which present market conditions and prices make burdensome. If a careful study is made it will often be found possible to reuse rail where such reuse in normal times would not be advisable.

The very general use of welders and grinders, and the improvements in joint and tie-plate practice also change the aspect of this particular problem. The problem seems to be to get 100 per cent wear, not only from our track materials but from all of the items that go to make up a railway property.

Economies worked out to-day under necessities of abnormal conditions cannot but produce still greater savings when conditions return to normal.

C. G. KEEN,
Engineer of Way and Structures.

Classification of Motor Trucks

BAY STATE STREET RAILWAY COMPANY
BOSTON, Feb. 6, 1917.

To the Editors:

It has been recognized for some time that a standard classification for trucks and car bodies, as well as for motors and other equipment, would be very desirable if it could be brought about. For this reason I am much interested in the article by Mr. Bullock in your last week's issue. In my opinion this is a subject which could very properly be taken up for consideration by the A.E.R.E.A. jointly with the manufacturers.

E. W. HOLST,
Mechanical Engineer.

PITTSBURGH RAILWAYS COMPANY
PITTSBURGH, PA., Feb. 7, 1917.

To the Editors:

In the article by S. A. Bullock of the Baldwin Locomotive Works advocating the use of a uniform system of symbols for defining the various classes of electric railway trucks, there has been opened up a subject which is timely and of interest to all equipment men. Mr. Bullock's proposed plan of classification at least provides a nucleus about which may be built a system which should include all types, classes and manufacture of trucks. Whether the three subdivisions of the proposed classification include all the essential characteristics necessary to designate properly all types is debatable, but this criticism is merely a question of detail and not fundamental. To illustrate, would it not be as desirable to differentiate between the equalizer-bar type, arch-bar type and plain yoke type as well as to express the characteristics outlined by Mr. Bullock? On the other hand, if all of the outstanding characteristics of the multitudinous design of trucks we have now with us are included in the same system of classification, it then may become so cumbersome as to defeat the purpose for which it was designed.

However, the need of a suitable system of classification must be apparent to all, and I believe the equipment committee of the Engineering Association could, with profit to all, include the study of such a system among its assignments of subjects.

F. R. PHILLIPS,
Superintendent of Equipment.

Compulsory Investigation Favored

Committee of National Chamber of Commerce Reports Almost Unanimous Vote on Its Strike Referendum

AT the fifth annual convention of the Chamber of Commerce of the United States, which was held in Washington on Jan. 31 and Feb. 1-2, the three main topics were the railroad situation, national defense and preparation for conditions after the war. The first topic was of most direct interest to electric railways, on account of the presentation of a committee report in favor of compulsory investigation of labor disputes on interstate carriers prior to strikes or lockouts. Strong action, however, was taken along other important lines, for the convention endorsed preparedness, the Webb bill and daylight saving, reaffirmed its stand for a national budget and pledged the business interests of the country to support the President in any eventuality.

The railroad committee reported on Jan. 31 that since its appointment in November, 1916, it had studied the Towne plan, which, as noted in the ELECTRIC RAILWAY JOURNAL of Sept. 30, 1916, page 692, contemplates taking from employees by contract all right to strike under any circumstances; and also the McClellan plan, indorsed by the Seattle Chamber of Commerce, which seeks to establish a wage-fixing board. The committee stated that it recognized as a matter of principle that when a man enters the railroad service, he by that act should surrender the right to join in concerted action to paralyze that service. It hoped for the ultimate adoption of this principle, but for the present it limited its recommendations as set forth in its referendum.

The major proposal covered by the referendum to members of the Chamber of Commerce provided for a full public investigation before any strike or lockout should be attempted on interstate railroads. To this were added two proposals designed to render the first more effective—*i.e.*, that upon any investigation or arbitration board the employers and employees should have equal representation and the public a majority representation, and that a permanent statistical division of the Interstate Commerce Commission should be established to compile statistics on labor and other subjects for the use of arbitration boards in future railroad controversies. The vote on these questions, which closed Jan. 30, 1917, was in no case less than 94 per cent favorable. This was the largest affirmative vote ever reported by the Chamber of Commerce.

At the same session W. D. Hines, chairman of the board of directors Atchison, Topeka & Santa Fé Railway, stated in an address that continuity of transportation cannot be relied upon so long as the government permits service to be interrupted at the pleasure of the railroad brotherhoods. Mr. Hines said that the present absence of strike talk on the part of the brotherhoods is merely temporary, in the hope that Congress may be induced to let the session end without legislation to protect the public's interest. After the Congress closes and the Supreme Court decides the Adamson act test case, the country will wake up to the purpose of the brotherhoods to have their own way or paralyze interstate transportation.

In a notable address on "Industrial Relations" on Feb. 1, Harry A. Wheeler, first president of the national chamber, took the point of view that the present industrial situation is a condition involving the conflict of two forces; that a complete adjustment between these forces should not be expected, and that the conflict will be carried on by both sides with increasingly efficient organized forces. This being so, Mr. Wheeler stated that in the interest of national safety these forces must come under some measure of control, for while the law may be powerless to harmonize conflicting human relationships, it can and must control the operations of known forces which, if allowed to continue without restraint, will trespass upon public rights and affect the public welfare. The action of organized labor heretofore has been within the trade or community or limited geographical area, but during the summer of 1916 it laid bare its claim to national influence and made apparent the necessity for national regulation. The public interest, as a third and now expressable interest in industrial disputes, said Mr. Wheeler, was born last summer and will hereafter demand its rightful voice in every national controversy.

Besides the report of the railroad committee, constructive reports were submitted along various lines. For example, the committee on daylight saving recommended that clocks in the United States be set one hour ahead of the standard time. If that plan should not prove feasible, it proposed that the clocks should be advanced one hour on April 1 each year and turned back on Nov. 30. Whichever plan should be adopted, however, the committee believed that the change should occur simultaneously in all parts of the country and that Congress should act in the matter. The committee on commerce proposes the addition of four closely related new functions in the Department of Commerce, as follows: To find out what it costs to do business in the United States; to deduce from collected facts sets of reasonably attainable standards for the various items of expense in different lines of business; to circulate information concerning the methods of the more efficient, and to work out better methods than those actually found in use. The committee on statistics and standards recommended the creation of a federal commission for the survey of all census statistics, and a resolution to this effect was adopted.

The main resolution passed at the end of the convention related to preparedness and the pending revenue bill. It approved the program of preparedness, as indorsed by the chamber's referendum and by various resolutions, and also pledged the support of the chamber to any just and reasonable taxation to support preparedness. It protested against the inequitable and discriminatory taxation of the pending revenue bill providing for a tax on corporations and co-partnerships, and, finally, declared that the business men of the country would approve of any bill drawn along the lines of fairness "so that every citizen would pay his just share of the tax."

Position-Light Signals

At a meeting of the New York Section of the Illuminating Engineering Society, held on Feb. 8, 1917, A. H. Rudd, signal engineer Pennsylvania Railroad, presented a paper on "Position-Light Signals for Railroad Service." He described the development and application of position signals and told especially of many difficulties encountered with position-light signals on the company's experimental line from Philadelphia to Paoli, and how they were overcome. One difficulty was to devise a means to maintain the lamp in a position so that the filament would have an exact relation to the lens. Another difficulty was to secure lenses that would not reflect the sunlight at certain times in such a way as to give false indications. The speaker said that enginemen were now almost unanimous in their preference for these signals and that he believed they would come into more general use since they fulfill very satisfactorily the requirements peculiar to the lines where they are installed.

AMERICAN ASSOCIATION NEWS

Manufacturers and Railway Men Confer on Overhead Specification

A sub-committee of the line material section of the Associated Manufacturers of Electrical Supplies and a sub-committee of the committee on power distribution of the Engineering Association met in Chicago, Feb. 6 and 7. The conference was for the purpose of harmonizing the differences between the Engineering Association's specifications for overhead material, as set forth in the 1916 report, No. 304, and the products of the several manufacturers. The two days were consumed in the consideration of malleable fittings, and agreement was reached on practically all differences. A second meeting to revise the specifications for bronze castings, wood and porcelain strain insulators, pole-line fittings, etc., will be held in Chicago on Feb. 26 and 27.

At the conference the Engineering Association was represented by E. J. Blair, Chicago, chairman; R. H. Rice, Chicago; A. Schlesinger, Indianapolis, Ind. The manufacturers' representatives were C. C. Peck, Ohio Brass Company, Mansfield, Ohio, chairman; James H. Drew, Indianapolis, Ind., and William Schaake, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Section No. 11 Organized in Toledo

A statement regarding the proposed organization of a four-sided joint company section on the property of the Toledo Railways & Light Company was given in the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 20. The section was organized as scheduled on Jan. 23 under the chairmanship of H. H. Ross, railway engineer, starting with an enrollment of ninety-eight men. The first speaker on the program was F. R. Coates, president of the company, who delivered an address in which he promised active co-operation with the new section. The Rail-Light Band, organized under the direction of S. J. Derge, assistant general manager, then played several selections.

Talks were given by out-of-town visitors. E. B. Burritt explained the ideas and ideals of the American Association. He was followed by G. B. Muldaur, field secretary National Electric Light Association, who spoke on "The Function of a Company Section." E. J. Blair, electrical engineer Chicago Elevated Railroads, represented the committee on company sections and individual membership, bringing greetings from his own section. Finally, D. H. Daskill, secretary National District Heating Association, addressed the section on public and interdepartmental relations.

Secretary H. Friede reports a fine spirit at the opening meeting, which took tangible form in the large enrollment mentioned.

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Utica Interurban Car with Air Operated Doors—Is There a Perfect Trolley Wire?—Trolley Wire Erection Costs, III—Ballast-Unloading Trestle Made of Ties—New Apparatus and Useful Suggestions

(Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.)

Quick-Loading Interurban Cars

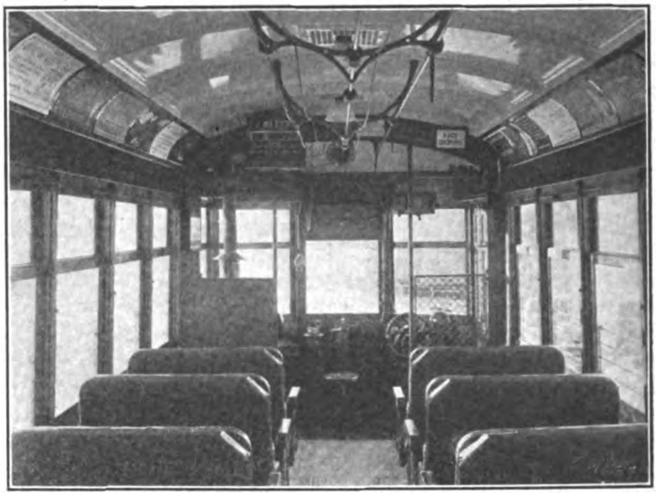
On the Utica Lines of the New York State Railways Equipment for Six-Car Train Service Has Been Designed with Inclosed Vestibules and Drop Platforms

BY J. R. AYERS
Master Mechanic New York State Railways, Utica Lines

The New York State Railways, Utica Lines, has recently placed in service twelve single-end interurban cars that were specially designed to give entrance and exit facilities equivalent to those commonly obtaining with city cars. Drop platforms with folding doors and steps have been provided at both ends of the car, and bulkheads have been omitted. This arrangement was adopted to permit rapid loading and unloading at points of congested traffic, the service involving a run of about 10 miles without stop to a point where more than 60 per cent of the passengers are discharged. The cars are run in trains varying in length from two to six cars, the composition of each train varying from all motor cars to half motor cars and half trailers.

An all-steel, arch-roof design was adopted in accordance with the general tendency toward these features displayed in modern car construction, and the bodies, which were built by the Cincinnati Car Company, possess several novelties in detail in addition to those already outlined. The general dimensions are as shown in the accompanying table.

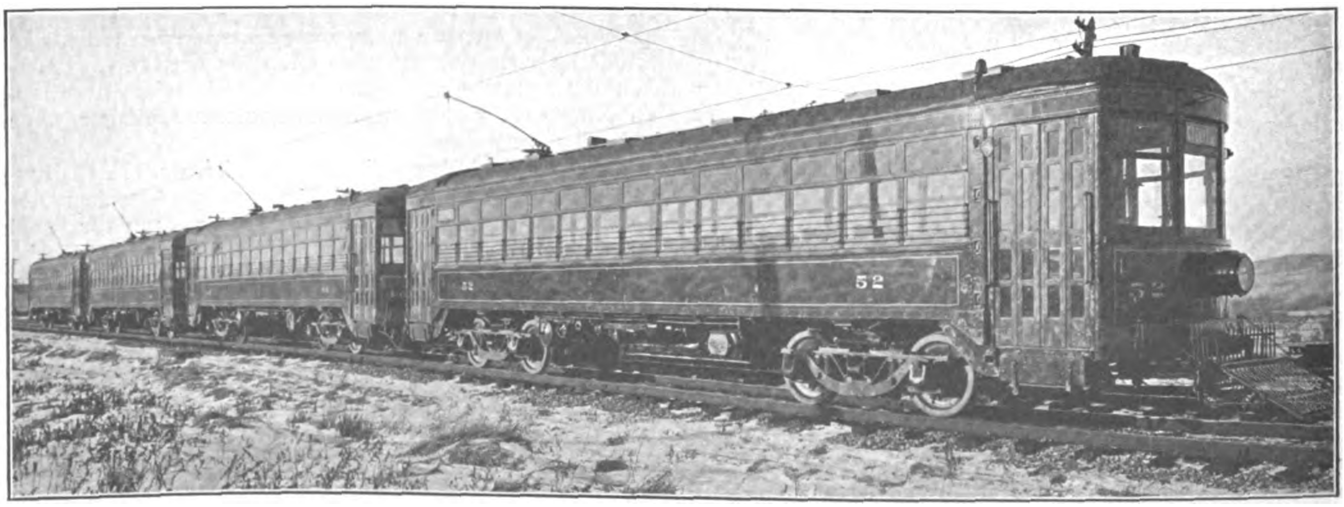
Length over all	49 ft. 8 in.
Length over dash	48 ft. 8 in.
Length over body	38 ft. 8 in.
Extreme width at belt rail	8 ft. 5 in.
Height from rail to trolley boards	12 ft. 1½ in.
Height from rail to first step	16½ in.
Height from first step to platform	14 in.
Height from platform to car floor	11 in.
Height of coupler center from rail	20 in.
Post centers	32 in.
Width of entrance door opening	38½ in.
Truck centers	26 ft. 8 in.
Width of seats	38 in.
Width of aisle	21 in.
Seating capacity	56
Weight ready for service	54,000 lb.



INTERIOR VIEW OF INTERURBAN CAR WITHOUT BULKHEADS

Inside of the car body all panels are insulated with cork covered with linoleum. Front and rear dashes have cork insulation only, with interior paneling of steel to form window pockets. The roof is steel riveted to the one piece T-iron carlines which also form the side posts. This surface which is finished white forms the inside finish of the car. The outside of the steel roof is insulated with 1-in. cork, covered with 6-ounce duck. Two thicknesses of 13/16-in. yellow pine, covered with ¼-in. Battleship linoleum make up the floor.

A Peter Smith forced-ventilation hot-air heater, which has a cold air intake arranged so as to take air



FOUR-CAR TRAIN FOR INTERURBAN SERVICE REQUIRING RAPID-LOADING FACILITIES from an opening in the bottom of the vestibule, is installed, and the interior lighting system comprises one circuit of six 94-watt Mazda lamps arranged with a selector switch.

The seats, which were designed to the railway company's specifications and manufactured by the Hale & Kilburn Company, are of the non-reversible type, with removable backs and Pantasote upholstering.

Other specialties are combination ventilating and lighting fixtures, illuminated roller signs, Ohmer registers, combination arc and incandescent headlights, Peacock staffless brakes, Root air-operated snow scrapers, Eclipse Frisco-type fenders, and Westinghouse 6-T signal switches for train operation. The passenger signal push button is of the trigger type.

At the forward end of the car the doors, which are operated by the motorman, are inward folding and work in conjunction with the step. At the rear the folding doors are operated by Chicago Pneumatic door engines. These doors also are inward folding, and the control mechanism is so arranged that the doors can be operated by the conductor from any point in the car. This is done by a control rod which runs the full length of the car in the same bracket as the bell cord, whistle cord, register cord, etc. As before mentioned, there are no bulkheads in the car, the motorman being amply protected from the light at night by means of three curtains.

During train operation the front vestibules are used by passengers as standing room. Therefore provisions are made, by means of small steel box, to lock up fuses, controller key, brake-valve handle, coupler unlocking valve handle and air-scraper handle. These operating accessories are locked up at all times, except in the cab of the motorman actually operating the car. As the box is provided with standard switch lock, all motormen and conductors have keys to it.

TRUCKS, BRAKES AND ELECTRICAL EQUIPMENT

Standard Baldwin trucks equipped with M.C.B. journal boxes, EB axles, and inside hung motors are used, but the height of the underside of the floor above the rail of 40 in., together with 35-in. wheels and the requirements of 33 ft. radius curves, made it necessary to design a special central brake beam.

Westinghouse AMM brake equipment with D-2-H compressor and M-22-A brake valve have been provided, this brake valve permitting six-car train operation. Westinghouse G-2 automatic car and air couplers also are used. For these couplers the uncoupling valves are located in each end of the car. The valve is so designed that it can be operated only by a specially shaped handle, and the latter can be removed only when the coupler valve is in the coupled position, this handle being always kept in the lock box in the cab.

The electric equipment consists of four Westinghouse 306-CV motors arranged for ALM control. As this type of control requires only seven-wire control cable for operation, the nine-wire train and jumper cable, which is standard on this property, permits operation of the signal switch wire, and the feed wire for lights and heater in trailers without any additional receptacles and jumpers.

The cars were equipped by the railway company's force, and special attention was paid to accessibility for inspectors to all parts of equipment. Everything that would have a tendency to reduce maintenance was given careful consideration. For example, valves that are liable to give trouble and can be repaired or cleaned by inspectors, have been arranged with unions on both sides so that they may be easily removed when this is necessary in order to make repairs.

GENERAL VIEW SHOWING INCLINE OF BALLAST UNLOADING TRESTLE

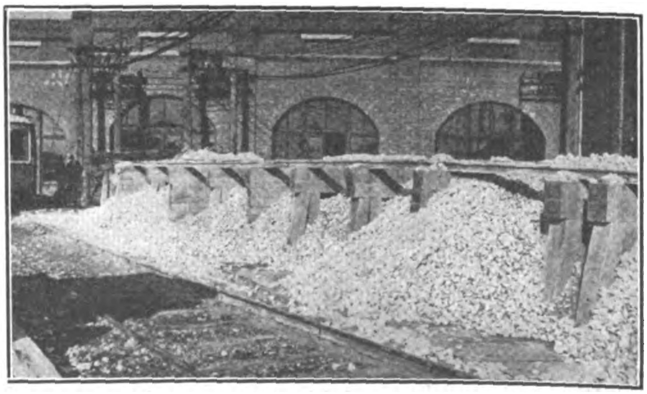
Temporary Unloading Trestle to Facilitate Handling of Ballast

BY E. R. DIKE
Engineer Maintenance of Way Chattanooga Railway & Light Company, Chattanooga, Tenn.

On nearly all of the construction and reconstruction work done by the Chattanooga Railway & Light Company, Chattanooga, Tenn., during the past six or eight years it has been practicable to pull the hopper cars in which the crushed limestone ballast was shipped to the point of use and to dump the ballast in the track, thus avoiding handling. On a recent job on Oak Street, however, which involved the reconstruction of 1 mile of double track and the use of 3000 cu. yd. of ballast, this was impossible because the ballast cars could not be pulled for several miles through the residence section of the city, and in addition a ten-minute to five-minute headway of passenger traffic gave insufficient time for unloading. This necessitated the dumping of the cars in the yard and reloading the ballast into work cars for final distribution.

To dump this ballast upon the ground or onto a platform level with the rail and to attempt to handle the ballast with reasonable cost and speed was impossible and gave rise to the scheme pictured herewith. The ideal system would be to erect a suitable trestle over storage bins and to have track for work cars near the bins. Such an installation was not practical in this instance for lack of space for the trestle and overhead room beneath the cables from the near-by power house.

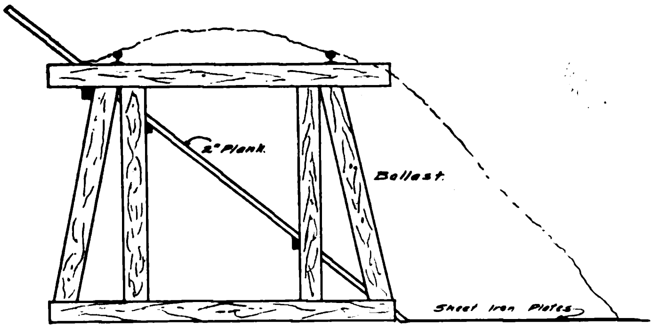
In the plan worked out and used with great success two tracks practically parallel were selected and one of them was raised by trestle bents made of ties to an elevation of about 6 ft. above the other track. Then a sloping floor, having a pitch of about 45 deg. and made of 2-in. oak plank, was constructed under the elevated track. The space from the toe of the slope to the other



CLOSE VIEW OF BALLAST IN STORAGE SPACE

track was floored with sheet iron covered with some old scrap plates such as are sometimes fitted to crossings. The grade of the incline was made about 5 per cent, and the work cars used to haul the ballast cars had no trouble in setting the latter upon the trestle.

As the dump doors on the cars are let down, the ballast runs out and assumes a position where it can easily be handled by the work-car crews. The empty cars are switched out by gravity. The space for ballast holds about eight carloads of 25 yd. each, or approximately 200 yd. When six or eight cars a day or even more were being set into the yard, this arrangement made possible their immediate disposal, while by the ordinary method of unloading it would have been necessary to hold some of these cars until demurrage was due. This arrangement also made it possible to load and deliver the ballast to the work more quickly.



ELEVATION OF UNLOADING TRESTLE ARRANGEMENT

The Ideal Trolley Wire

The Author Reviews the Qualities of Different Materials and Outlines the Proper Service for Each

BY G. H. McKELWAY
Engineer of Distribution Brooklyn Rapid Transit System

It might just as well be said at the beginning that the ideal trolley wire is like the old countryman's "gi-raf-fee." "There ain't no such animal." The ideal wire should be low in first cost, should never wear out or break, should have a salvage value when taken out of service equal to that of new wire, and in addition, its conductivity should be 100 per cent. It is self-evident that no wire can fulfill all of these requirements, and the most that one can hope for is a wire that will approach them.

PROPERTIES OF METALS USED FOR TROLLEY WIRE

Only two metals can be seriously considered for trolley wire, viz., copper and iron. Other metals are used in the manufacture of the wire, but they are used only in the making of alloys of which the base is copper or iron. In practice the number of kinds of wire can be reduced to four; viz., copper, steel, bronze, and copper-clad, a physical combination of copper and steel. While "bronze" and "copper-clad" are sometimes considered as trade names by certain manufacturers, it should be understood that these names in this article do not specify particular makes of wire.

Although there is no wire that approaches steel in low first cost, it must be remembered that it is often the custom to use a steel wire of greater cross-section than would be considered for any of the others. Hence, while the cost per pound may be very low, the cost per foot is higher than if the usual cross-sectional area was used, although not as high as that of the other kinds of wire. It would be the most expensive per foot if of the same conductance as the other types, for a 1,000,000-circ. mil steel wire would be needed to take the place of a No. 0 copper wire. Such a wire is never used, however, the largest steel trolley wire that has ever been drawn, to the knowledge of the writer, being No. 000000, and the usual size is No. 0000. When the price of metals again becomes normal the prices per pound will approximate the following: Bronze, 21 cents, copper, 18 cents, copper-clad, 18 cents and steel, 7 cents.

It might be supposed that the values of the metals as salvage would be a certain proportion of their first cost, but this is not true. The copper and bronze wire decrease but little in value while the other two kinds lose in a much greater ratio. Copper scrap and bronze will be worth about 14½ cents, copper-clad wire only about 4 cents, while ½ cent will be a good price for the steel.

In ease of installation the copper wire is found to lead, but is closely followed by all three of the other types, among which there are slight differences. Bronze wire may take second place in this comparison, but there is little to choose between it and either of the others.

In conductivity the copper wire leads again, its relative conductivity ranging from 97 per cent of that of pure soft copper for hard-drawn wire of unusually good quality down to almost 90 per cent for an extra hard-drawn wire which has been used but very little. Ninety-five per cent is a good average figure and one that can practically always be met. The conductivity of bronze wire ranges from 85 per cent with a comparatively soft wire to 40 per cent, and will average about 45 per cent. Copper-clad wire has a conductivity varying from 50 per cent to 25 per cent, averaging about 40 per cent. That with less than 35 per cent is seldom used for trolley wire. The conductivity of the steel wire is only about 10 per cent.

DESIRABLE QUALITIES OF TROLLEY WIRE

Of the many qualities which enter into the manufacture of a good contact wire, the following are important: strength, ductility, hardness, stiffness, high elastic limit, resistance to arcing, high melting point, toughness, homogeneity and permanence of the original good qualities under wear. Tensile strength is an important item because of the severe treatment that the ordinary trolley wire receives not only from the elements, but also from the blows of "wild" poles. Occasional slow, heavy pulls are to be expected such as follow when a trolley wheel leaves the wire and the pole is pulled down with the wheel engaged in a span. Ordinary No. 00 hard-drawn copper wire will withstand a pull of about 5500 lb. before breaking. All three of the other types have about the same tensile strength which will average for wire of this size about 7800 lb.

The elastic limit of all of these wires is about 75 or 80 per cent of their ultimate strength. However, since the strength of the copper wire is much below that of the other three, it will break before any of the others have been strained enough to produce a permanent set.

Ductility and hardness might be considered as opposite qualities, yet no trolley wire should possess one in excess with the other negligible. The wire needs to be hard to resist the grinding action of the trolley wheels, which is sometimes great on sharp curves, yet it should have sufficient ductility to prevent breaks due to crystallization at ears, circuit breakers, crossings or other hard spots in the line. In order that the wire may not be too brittle, it is well to specify that when broken in the laboratory it will stretch at least 3 per cent in 10 in., with a maximum of 5 or 6 per cent. A soft wire will not only lack the strength of a harder one but will stretch after being installed and thus become too slack, especially in warm weather. This slackness might permit the trolley wheel to ride on its flanges in the trough under a bridge structure due to its pressure upward on the wire.

While resistance to arcing might be considered as a minor virtue, nevertheless, much depends upon this quality, as is shown by the rapid wear and increased tendency to break evidenced in wire from which heavy currents are taken. This is true, for instance, on grades or at points where the cars are started. The troubles from this cause appear to be greatest with the steel wire and least with the bronze.

By high melting point is meant not merely the ability to resist high temperatures but the ability to carry heavy currents such as will flow through a grounded trolley wire without fusing or serious annealing. If the melting temperature was the only thing to be considered steel wire would have an advantage over copper in that their melting points are about 2500 deg. Fahr. and 2000 deg. Fahr. respectively. However, with the same currents flowing through the two wires the temperature of the steel will be much the higher owing to its higher resistance, so that the copper will melt later. It has been asserted that, owing to the higher resistance of the other wires, not so much current will flow through them as through the copper when they are grounded. This is true to a degree, but the current will not vary inversely as the resistance of the trolley wire because the trolley constitutes only about one-half of the circuit.

The tension test for trolley wire, regarding which there has been considerable discussion, has been retained because most engineers believe that it gives a better measure of toughness than any other test. The writer has never made, or seen the results of any tests of this character on steel or copper-clad wire, but the results of several hundred tests on copper and bronze wires show that the latter will stand almost twice as many twists as the former, the figures for 10 in. being approximately forty and twenty respectively.

By homogeneity is meant the sameness of characteristics in all parts of the wire. This quality cannot exist in copper-clad wire, but it will be found in both steel and bronze wires and perhaps in copper wire. It is generally believed, and until a short time ago the writer thought universally accepted, that with a hard-drawn copper wire the greatest strength was to be found in a thin skin of metal on the outside of the wire and that the inside of the wire was but little stronger than soft copper. Tests have been published to confirm this opinion, although it has been said that the rolling action of the trolley wheels tended to harden the metal on the inside as the outside was worn off. A short time ago, however, one of the large wire companies made tests which showed that the action of the drawing had its effect entirely through to the center of the wire. Successive skins were removed, both by cutting and by etching with acid, and the wire on the inside stood up under the same tests as that on the outside; the appearances of both under a microscope being the same.

It is important that the wire shall not only begin its service in good condition, but shall retain its good qualities. In this respect the bronze wire appears to have an advantage over the others. Tests made on copper wire cut from lines that have been in service for a number of years show that the copper has become virtually the same as that in soft drawn wire. Steel wire, too, will show the annealing effect of heavy currents, although to a lesser degree than copper, and in addition, after being up in the air for a time the steel wire will begin to rust. To prevent this it has been proposed to use galvanized wire, but the writer does not know that this has ever been done. One company attempted to resist corrosion by painting the wire. The writer cannot speak with authority as to the effect of heavy currents on copper-clad wire, but it is logical to assume that the effect would be the same as with copper or steel wire since it is composed of both metals. Another change which occurs to the copper-clad wire is a greater increase in resistance due to the wearing away of the copper of high conductivity on the outside, leaving only the steel core. Tests made on bronze wire, after years of use, show that this wire retains practically the same qualities that it had when put up.

PROPER SERVICE FOR DIFFERENT MATERIALS

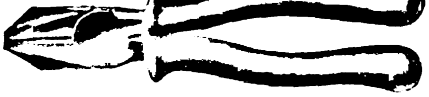
From the foregoing it is seen that no wire possesses all of the good qualities. The engineer must decide in each case which qualities are most important for the line under consideration and purchase the wire that best embodies them, instead of merely following the practice of some other road which may be operating under very different conditions.

With long, comparatively light lines, where there is little or no feeder in multiple with the trolley wire, conductivity will be the important consideration and therefore copper would naturally be used. On the other hand, where the service is very frequent and heavy, necessitating the use of heavy feeders and frequent side feed taps, as for instance in the downtown sections of large cities, strength, toughness and all other qualities which will cut down the number of breaks would point to the adoption of either the bronze, copper-clad, or steel wire. Under trough work, where there are hard spots at every hanger, with the ordinary construction the steel wire will not last as long as the other two, as it cannot withstand the constant hammering. Steel wire is also at a disadvantage where heavy currents are required, as in freight or train service, since it will not resist the arcing as well as the bronze or copper-clad wires, especially the former. Copper wire will withstand the effects of the arcing under such service, but has not the needed physical strength.

With high voltages and the resultant reduction of current and lessened percentage of line drop, the steel wire comes into its own realm, more particularly on lines of light traffic. It will be recalled that the New York, New Haven & Hartford Railroad was the first to use the steel contact wire, but owing to its heavy service, it has more recently adopted bronze wire for the latest construction and for gradual replacement of steel. The fusing, burning and corroding of steel were potent factors in making this improvement despite the much higher cost of bronze.

Pliers Insulated for 10,000 Volts

Pliers of tool steel, insulated for 10,000 volts, are being made by the Rubber Insulated Metals Corporation, Plainfield, N. J. The insulation is a rubber compound that will not only give high-voltage protection, but it has satisfactory wearing qualities as well. It is said that the bond between the rubber and the metal is such that after some severe tests the insulation showed no tendency to loosen from the handle. Another feature of this tool is that each bears the stamp of approval of the Electrical Testing Laboratories, Inc., of New York City, showing that it has passed satisfactorily a test at 10,000 volts.



PLIERS WITH RUBBER INSULATED HANDLES

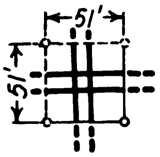
Cost of Erecting Overhead Work—III

(From the records of a large Eastern company)

The following is the third group of a series of diagrams with figures to show actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. The first and second groups in this series appeared in the issues for Jan. 20, page 127, and Jan. 27, page 173. The remaining groups will be published in later issues.

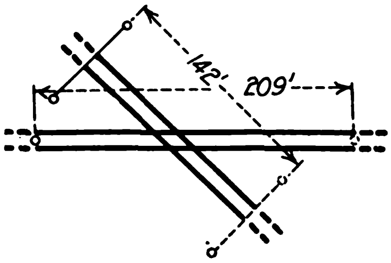
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Double track crossing double track, angle 90 deg.



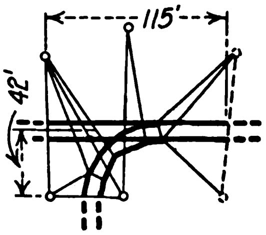
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
18	$15.95	$6.60	$19.14	$7.92	$22.33	$9.24

Double track crossing double track, angle 45 deg.



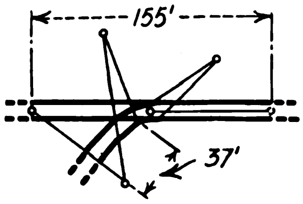
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
19*	$18.15	$13.20	$21.78	$15.84	$25.41	$18.48

Double track, left-hand branchoff, angle 90 deg.



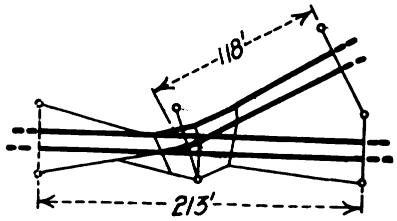
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
20	$23.93	$9.90	$28.71	$11.88	$31.90	$13.20

Double track, left-hand branchoff, angle 45 deg.



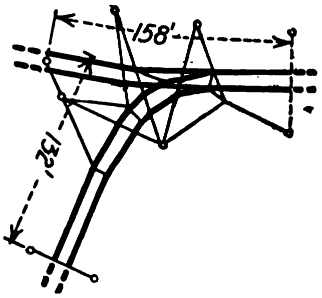
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
21	$23.93	$9.90	$28.71	$11.88	$31.90	$13.20

Double track, left-hand branchoff, angle 30 deg.



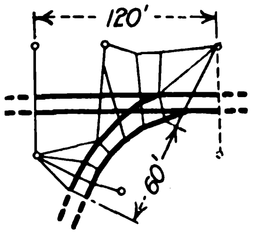
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
22*	$29.04	$21.12	$36.30	$26.40	$45.38	$33.00

Double track, left-hand branchoff from curved main line, angle 60 deg.



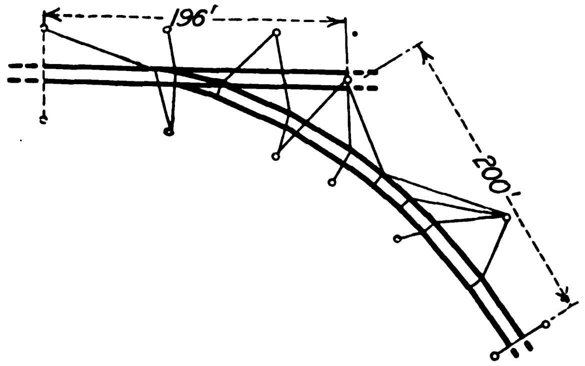
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
23*	$36.30	$26.40	$43.56	$31.68	$50.82	$36.96

Double track, left-hand branchoff, angle 60 deg.



No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
24	$25.52	$10.56	$30.31	$12.54	$36.69	$15.18

Double track, right-hand branchoff, angle 60 deg.



No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
25*	$36.30	$26.40	$45.38	$33.00	$54.45	$39.60

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*Trucking includes cost of extra reel truck. None of the figures on this page includes cost of superintendence and engineering.

Storage, Handling and Filtering of Insulating Oils

Too little attention probably has been given to the proper handling of insulating oils by those handling oil-insulated electrical apparatus. The engineers of the Westinghouse Electric & Manufacturing Company advise attention to the following considerations:

Insulating oils are generally shipped either in the tank with the apparatus, in soldered tin cans, or in steel drums provided with screw bungs which are sealed before shipment. Oil in unsealed drums should be tested before use. It is advisable to store drums in a closed room, but if they are stored out of doors, protection from the weather should invariably be provided. They should always be placed on their sides in storage, for when they are turned up on end, water can collect in the head around the bung.

All apparatus should be thoroughly dried before filling, and during the actual transferring of the oil every care must be taken to prevent moisture from getting into either the oil or the apparatus. A drum of cold oil when taken into a warm room will "sweat," and the resulting moisture on the outer surface may mix with the oil as the latter flows from the drum. Before breaking the seal, therefore, the drum should first be allowed to reach room temperature. All vessels used for transferring the oil should be absolutely dry and free from metallic or carbonaceous particles.

Immediately before placing the oil in the transformer or switch tanks particles of foreign matter, scale, etc., should be removed. Such may have adhered to the interior of the drum too firmly to be removed by the washing and drying which the drum received at the oil refinery before filling, but may have become loosened by the continual swashing of the oil during transit. This material can be conveniently removed by using a funnel of large size, the top of which is covered with a filter made of two layers of any ordinary, finely woven, cotton cambric that has been thoroughly washed and dried to remove the sizing. If slightly warm, the oil will pass through this filter more rapidly. The funnel may be made to discharge directly into the tank of the electrical apparatus, otherwise the oil must be returned to an empty drum which is known to be thoroughly clean and dry. The thoroughness with which the filtering has been done may be determined by measuring the dielectric strength of the oil with a testing cup and spark gap.

Hints on Blasting Hardwood Stumps

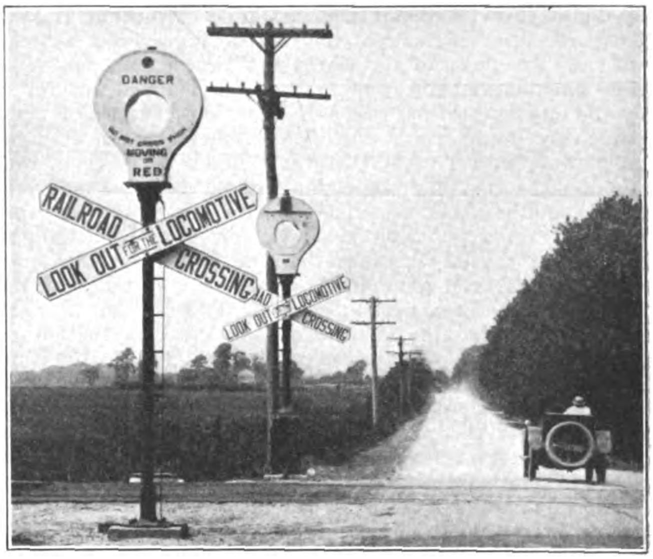
Stumps of maple, beech, birch, hemlock and basswood, commonly known as hardwood stumps and found in the northern part of the country, are removed by blasting with dynamite. Detonation is done with cap and fuse, as the use of a blasting machine is rarely required. The principal reason for using dynamite is that of economy. This requires that the proper amount of charge be placed under the center of the stump, or the point of greatest resistance.

The proper dynamite for hardwood stumps is a medium-slow powder of 40-per cent strength. Dynamite of 20-per cent strength is sufficient for old stumps on clay soil, while for green stumps on lighter soil 60-per cent strength is recommended. A hole for the charge is made with a piece of steel shafting about 6 ft. long with one end drawn to a point. The other end is flattened like a chisel to cut small roots. Such a bar, weighing about 25 lb., can be used to strike the stump to "sound" it, and thus help to determine the proper amount of charge.

Wigwag Signal Used at Highway Crossings

The Hall Switch & Signal Company is putting on the market an oscillating type of highway crossing signal, or flagman. In its method of indication, this signal is somewhat similar to a wigwag signal of another make described in the issue of the ELECTRIC RAILWAY JOURNAL for July 22, 1916, page 151. It is at present installed on several Eastern steam roads, but is equally applicable to electric roads.

The electrically-operated crossing flagman appears as shown in the accompanying illustration. It has a case with two circular openings of unequal sizes, fitted with glass, through which the indications are displayed. Danger is indicated by two red disks operated by a signal instrument inside the case. The disks travel in arcs of a circle and oscillate simultaneously in opposite directions. They are so placed that as they pass the central position they coincide with the openings. The larger disk, as it oscillates past the large opening, indicates danger by day. A lamp is mounted on the back of the case so that the light is seen through the small opening. This gives the warning at night as the smaller disk passes in front of it. More than one small opening with lamps can be provided to give a series of red flashes for the night indication.



WIGWAG SIGNAL FLAGMAN SHOWING CLEAR

Should the apparatus become deranged, the danger indication is automatically displayed as the disks assume positions opposite the openings. The signal light then appears red continuously and during the day the larger disk is visible through the large opening. For a clear indication the disks are held out of sight to leave the white light visible and the large opening clear. The signal is also designed to display indications in both directions, and is used with gong or horn if desired.

According to information compiled recently by the Government Forest Service, 102 treating plants, operating throughout the United States, report a total of 125,639 poles treated in 1915. This is estimated to be about one-half the actual number subjected to treatment, since a large number given a brush treatment are not reported. The principal preservative used was creosote oil, and the average absorption was about 11 lb. per cubic foot. About 85 per cent of the poles treated were yellow pine, while western red cedar and Douglas fir largely made up the remainder.

News of Electric Railways

Traffic and Transportation

Financial and Corporate Personal Mention Construction News

Petition Before Commission

Philadelphia Presents Petition to Public Service Commission—P. R. T. Presents Full Text of Its Rapid Transit Offer

Virtually no opposition was offered when the application of the city of Philadelphia for permission to construct the proposed high-speed subway and elevated system was heard by Public Service Commissioner James Alcorn at Harrisburg recently. Although the entire high-speed system, with the exception of the Darby "L," was under consideration, only one modification in the plan mapped out for it by the city authorities was asked for, and that was a comparatively unimportant one. City Solicitor John P. Connelly, who, with Transit Director William S. Twining, represented the city of Philadelphia, agreed that this modification should be made, affecting as it did one of the principal hotels of the city. Now that the formality of holding a hearing of the city's application for a certificate of convenience has been gone through before a member of the Public Service Commission, Director Twining can at once let contracts for the continuance of the construction of the high-speed lines under the present plan, unless the commission should itself decide upon further modifications, which is considered extremely unlikely. The application did not cover the proposed Darby "L" because the plans for it have not been completed, nor did it include the Frankford "L" south from Callowhill Street for the same reason.

The complete text of the Philadelphia Rapid Transit Company's offer to lease and operate the city's high-speed lines has been delivered to Mayor Smith in the form of a lease ordinance. Except as to a few modifications to provide for contingencies, the amplified copy conforms to the original plan presented to the city on Dec. 20, and noted at length in the ELECTRIC RAILWAY JOURNAL of Dec. 30, 1916, page 1359.

BONDS TO BE ISSUED

The draft of the ordinance reveals the fact that the company proposes to raise the money for equipping the lines by an issue of first-mortgage gold sinking-fund bonds. It has been estimated that it will require $19,000,000 to equip the lines, and this, it was believed, would be raised with the aid of the Union Traction Company, by assessment on the stock of that corporation, making it full paid. Such a contingency is provided for, but it is specified that the money which shall be raised by such payments on the stock of the Union Traction Company is to be used for additions, betterments, refunding and other proper capital expenditures, under the provisions of the 1907 contract between the city and the Rapid Transit Company.

Bids for the construction of the subway delivery loop were opened on Feb. 6 by Director Twining of the Department of City Transit. One of the bidders was a new company, the Philadelphia Subway Construction Company, in which State Senator Edwin H. Vare is said to be the dominating figure. One of the incorporators is Norman G. Degnon, of the Degnon Contracting Company, New York, N. Y., and another is George D. Grover, an engineer in Mr. Vare's employ. The low bidder, apparently was the Keystone State Construction Company, which is controlled by State Senator James B. McNichol, the political rival of Mr. Vare. On contracts No. 201, 202 and 203 the bids of the Keystone company were $1,575,000, $2,496,000 and $1,713,000, a total of $5,784,000. This company is already engaged on contract No. 1, which covers the City Hall section of the Broad Street subway.

The Public Service Commission will hold a hearing on the Philadelphia subway and elevated applications in Philadelphia on Feb. 15.

Hearing on the Frontier Railway

Case Adjourned Pending Decision as to Merits of Application to Have Certificate of Convenience Revoked

The plans of the Pennsylvania Railroad and the Delaware, Lackawanna & Western Railroad to use the Frontier Electric Railway between Buffalo and Niagara Falls as an extension of their freight trunk lines were revealed before the Public Service Commission for the Second District of New York at Albany, on Feb. 7. H. A. Taylor, attorney for the Erie Railroad, filed an application for the revocation of the certificate of convenience and necessity granted to the Frontier Electric Railway by the commission. The case developed into a struggle between the Pennsylvania Railroad and the Delaware, Lackawanna & Western Railroad on the one hand and the Erie on the other for the business of the rich, industrial territory at Niagara Falls and possibly future connections with the proposed new transcontinental line of the Canadian Northern Railway. Chairman Van Santvoord of the commission said:

"I had no idea from the testimony presented that this was to be a fast freight line when I voted to give it permission to cross certain highways. All the testimony was to the effect that it was to be a suburban and electric passenger line."

He then asked the representatives of the Pennsylvania and the Lackawanna railroads as to whether the proposed line was to be used for freight. In reply, J. G. Rodgers, superintendent for the Pennsylvania Railroad, said:

LOCAL FREIGHT LINE PROPOSED

"It is certainly to be a local freight line with the possibility of later making it part of a through freight line to Canada."

Thereupon the chairman of the commission said:

"We have never entered into any inquiry as to the necessity of another freight line. In fact, this commission recently found that there was no public necessity for a similar freight-carrying project."

L. L. Babcock, attorney for the Delaware, Lackawanna & Western; Morris Cohn, for the Frontier Electric Railway, and E. G. Connette, president of the International Railway, Buffalo, argued at length to the effect that the Frontier Electric Railway, incorporated under the railroad law, has always been both a freight and passenger road, and so always made its applications.

Mr. Van Santvoord said:

"Irrespective of this controversy over business between the railroads I do not believe that we should permit these railroads to extend a new freight trunk line to the Canadian border without full notice to the people of that territory."

The commission indicated that the present application of the Pennsylvania Railroad and the Delaware, Lackawanna & Western Railroad to buy into the Frontier Electric Railway would not be disposed of until the commission had been satisfied of the necessity for the trunk freight line. The hearing was adjourned pending a decision by the commission as to the merits of the Erie Railroad's application to have the certificate of convenience revoked.

The hearing on Feb. 7 was a continuation of the one commenced on Jan. 15 before the commission on the application of the steam railroads mentioned previously for permission to purchase the capital stock and the right-of-way of the Frontier Electric Railway between Buffalo and Niagara Falls, parallel and contiguous to the high-speed line which the International Railway now has under construction. The previous hearing was reported in the ELECTRIC RAILWAY JOURNAL for Jan. 20, page 135.

Progress in Chicago Plans

Bills for Enabling Legislation to Make Financing Possible Approved by Committee

Means for obtaining enabling legislation to carry out the plans of the Chicago Traction & Subway Commission rapidly took definite form at the meeting of the local transportation committee of the City Council on Feb. 5. The committee approved with a few changes the draft of the McCormick bill for "home rule" for Chicago utilities, outlined briefly in the ELECTRIC RAILWAY JOURNAL for Jan. 27. The committee also approved a bill for the consolidation of the elevated and surface lines. A provision is written into the proposed consolidation bill which will prevent the owners of a few shares of stock from holding up the consolidation plans, reservation being made that the minority stockholders who might object to consolidation shall have the right to go into court and obtain cash for such real value of the securities as the court might fix.

Walter Fisher, special counsel for the committee, recommended the granting of a thirty-year franchise to the new consolidated companies, with provision written into the ordinance for a twenty-year extension of the franchise, provided the city did not take over the property at or before the expiration of the thirty-year period. The city will have the right to take over the property by paying the unamortized investment after such part of the franchise period has elapsed that the investment will be a certain percentage retired. This percentage is under consideration but will probably be fixed at 50 per cent, which would mean at the end of thirty years, provided all expenditures were placed in revenue-producing properties. The securities issued, by this plan, will not necessarily expire in 1947, as the ordinance will provide that the city assume the unpaid balance whenever it takes the property over. This will make financing easier. Mr. Busby is still holding out for the indeterminate franchise and this is also favored by Mr. Fisher, but the latter believes it impossible to secure the necessary constitutional amendment in less than five years.

These various items have been taken to Springfield to be introduced before the General Assembly, with the understanding that they may be revised by the City Council when it acts upon them, but they are placed before the Assembly at once in the hope that they may be passed and be ready for referendum vote in April or June.

I. T. S. Makes St. Louis Freight Connection

After the city of St. Louis had refused permission to the Illinois Traction Company to make a freight connection at Hall Street with the tracks of the Terminal Railroad Association the company made the connection at night over private property, with the consent of the Missouri Public Service Commission.

The company now is in direct connection with every steam railroad and industrial plant switch in St. Louis for coal deliveries. It has had on file for years a coal tariff of 10 cents a ton from the Tri-cities in Illinois to any point on its lines in St. Louis, although it has been unable before to reach any steam railroad and only hauled coal to the end of its bridge, where it was dumped into bunkers for dealers to cart away. The company operates over the streets of Venice, Ill., which is opposite St. Louis, on the surface. It is stated unofficially now that the company plans to construct an extended bridge approach crossing Venice, Ill., to facilitate the expected heavy coal traffic.

Ira L. Burlingame, general traffic manager of the Terminal Association, has admitted that the connection between the Illinois Traction System and tracks of the Terminal Railroad Association had been built without the knowledge or consent of the Terminal Association officials. He said no coal cars had yet been tendered to the terminal and until such tender was made, he could not say what the policy of the Terminal Association would be.

The freight connection was made without crossing a city street, as formerly had been planned. A sharp turn was made on the Illinois Traction Company's own property, and its tracks tied to the Terminal without touching city ground.

Another Atlanta Dynamiting

Shortly after midnight on Feb. 5, after more than two months and a half of surcease from this type of violence, a car of the Georgia Railway & Power Company, Atlanta, Ga., was dynamited by strike sympathizers. The dynamite was laid on the company's rails in front of the English Avenue public school. A number of windows were broken in the car, the floor was damaged, and one of the wheels was cracked. Two city policemen were riding on the car, not as guards but as casual passengers. No injuries were sustained by them or the members of the car crew.

The last preceding instance of dynamiting in connection with the so-called strike against the Georgia Railway & Power Company, in the name of the Amalgamated Association, occurred on the night of Nov. 15, 1916, after a season of dynamiting that had begun on Oct. 5 and in the course of which thirty-one cars of the company were subjected to this form of violence.

The English Avenue School was the scene of an ambuscade in that same season, a number of men hiding behind the bushes in the school yard and "shooting up" a passing car late one night, wounding a member of the car crew.

On the day preceding the dynamiting of Feb. 5, Edward McMorrow, organizer of the Amalgamated Association, returned to Atlanta after an absence of several weeks.

The transportation department of the Georgia Railway & Power Company has been fully manned since immediately after the first disloyal trainmen abandoned their cars at the beginning of the evening rush hour on Sept. 30, and joined the Amalgamated Association.

An extended account of Atlanta's reign of terror in connection with the strike agitation was published in the ELECTRIC RAILWAY JOURNAL of Dec. 16, 1916, page 1262.

Electrification Work at Salt Lake

Plans Announced in May, 1916, Delayed on Account of Rearranging Plan of Financing, but Work Will Continue

The Salt Lake, Garfield & Western Railway, which owns and operates a steam railroad running between Salt Lake City and Saltair, and operating under the jurisdiction of the Interstate Commerce Commission, has work under progress for the extension of its lines from Saltair to Garfield, the whole line to be electrified. This comprises 17 miles of present railway and with the extension will include 20 miles of main linetrack.

Announcements of this extension and electrification work were made in the ELECTRIC RAILWAY JOURNAL for May 13, 1916. Owing to rearrangements in the plan of financing, construction work was delayed but has recently been resumed. All rails, poles, and ties are on the ground. The copper trolley and equipment, however, are yet to be purchased. The type of equipment and nature of electrification has not as yet been determined, but it is understood that H. A. Strauss, consulting engineer, Harris Trust Building, Chicago, who has this matter in hand, is in Salt Lake City at present to study the requirements. The work is being financed by C. F. Childs & Company, Chicago and New York, by means of a $300,000 first mortgage bond issue.

This railway affords the only transportation to the lake and to Saltair, which is visited by several hundred thousand people annually. The extension to Garfield will furnish a high-speed frequent service for the residents of that city to Salt Lake City. The concentrating plants of the Utah Copper Company and the smelters of the American Smelting & Refining Company are located at Garfield and the famous "copper mountain" of the Utah Copper Company, is located directly behind the city in Bingham Canyon. Since the mountain is connected with Garfield by the private railroad of the copper company, it is anticipated that considerable passenger traffic may be expected from this territory over the electrified line into Salt Lake City. It is also anticipated that with the improved service, the Salt Lake, Garfield & Western Railway may secure the transportation of some of the output of the copper smelters. The company now hauls considerable freight, this business including at present the transportation of 6000 tons of salt a month.

$7,000,000 Canadian Project

Failure of property owners along the route of the proposed Toronto-Niagara Falls hydroelectric line to approve bond issues for its construction has prompted the Canadian Northern Railway to decide to start immediately on the construction of a double-track line between Toronto and the Canadian-Niagara frontier at Niagara Falls, Ont., a distance of about 84 miles. Included in the company's plans is provision for the construction of a bridge across the Niagara gorge near the Bridge Street terminal of the International Railway, at Niagara Falls, Ont. The Canadian Northern Railway will have direct connections with the Erie, the Lackawanna, the Pennsylvania and the Lehigh Valley Railroads. Construction work, which will probably start in April, will involve the expenditure of more than $7,000,000. The route passes through Hamilton and St. Catharines, Ont., and the heaviest grades will be less than one-half of 1 per cent. Bridges will be built at Oakville, Bronté, across the Désjardines canal and River Jordan. The Ontario-Lewiston Connecting Bridge has been incorporated to handle the details of the Niagara gorge structure. Sir William MacKenzie of the Canadian Northern Railway is discussing the possibility of operating electric locomotives over the route, especially in view of the new power canal project of the Ontario Hydroelectric Commission.

Another Hudson Tunnel Reported

It has been reported recently that the Public Service Corporation of New Jersey was planning to extend its electric railway service from New Jersey under the Hudson River to New York City. A statement made by the company in regard to the matter follows:

"The Public Service Corporation has only this to say upon the subject at this time: Its officers have for a long time had in mind a tunnel project. Within the year it has begun such investigations as are necessary. The investigations have not been completed. Until they are completed the subject cannot be discussed by the Public Service Corporation. When the investigations are finished, the company will be glad to make public its findings and its conclusions."

Partnership Suggested in Frisco

Jesse W. Lilienthal, president of the United Railroads, San Francisco, Cal., was quoted by the San Francisco *Journal of Commerce* on Jan. 31 in part as follows:

"The time is not ripe for naming a figure which shall become a basis of sale to the city. If this were a matter between two corporations negotiations might be quickly brought to a head. But the entire public has to be taken into consideration in this case. Education, explanation and discussion of the merits of the various propositions are a necessary precedent to action.

"A physical valuation of the properties is now being made by the Railroad Commission. That will be used if the sale proposition is considered. I do not doubt that any set of fair-minded and competent men can agree upon a right valuation. I contend that the operation of a successful municipal system of street railways makes a monopoly necessary. I cannot expect the city to sell to us. Therefore I offer to sell to the city.

"The proposed four-line system down Market Street is unreasonable. The ideal street railway system would be one built by private capital, operated by a private company, the city to have a voice in the management, extensions to be made under the guidance of or at the instance of the city government, the municipality to have a definite fixed share of the earnings of the roads, and a valuation to be placed in advance upon the entire property with the proviso that the city might at any time buy the system at the price fixed. In such a case the franchise would be indeterminate. Price would be set on each new extension before construction. The public would be amply protected. Under such an arrangement San Francisco would be well served with transportation facilities and there would be no duplication. I cannot get money for extensions under the present system."

Operating Allowance Increase Asked

Cleveland Railway Makes Plea for Increase Under Tayler Grant

At the regular meeting of the Council of Cleveland, Ohio, on Feb. 5, a letter was read which had been addressed to Fielder Sanders, street railway commissioner, by J. J. Stanley, president of the Cleveland Railway, in which Mr. Stanley asked that the operating expense allowance be increased from 13½ cents per car mile to 15 cents. The letter also asked authority to charge off deficits in the operating allowance and maintenance reserve account from the interest fund.

Mr. Stanley stated that the operating deficit on Jan. 1, 1917, was $195,075, and that the deficit in the maintenance reserve account was $268,918. These deficits are due to abnormal expenditures, payments for injuries and damages, increased wages and the high price of supplies. Practically the same causes contributed toward the higher operating allowance requested.

Expressions from Chairman Reynolds of the street railway committee and Councilmen Myers and Stolte indicate that they will oppose any movement to increase the operating allowance, but they did not give any plan by which the increasing expenses can be met by the company without this step. Mayor Harry L. Davis refused to comment upon the matter until he could confer with Mr. Sanders, who is ill.

An increase in the operating allowance would no doubt mean an advance in the rate of fare, especially if present deficits are deducted from the interest fund. Under the provisions of the Tayler franchise an increase in fare would follow the reduction of the interest fund to less than $300,000.

A resolution has been adopted by the Council authorizing the Cleveland Railway to expend $300,000 for a new substation.

$1,500,000 to Be Spent in Tacoma

Louis H. Bean, general manager of the Tacoma Railway & Power Company, Tacoma, Wash., is authority for the statement that approximately $1,500,000 will be spent during 1917 in Tacoma by that company and the Puget Sound Electric Railway, both of which are controlled by the Puget Sound Traction, Light & Power Company. A considerable amount of the funds appropriated will go into new equipment and for bettering the service. The company plans to spend $70,000 for new cars, and will install heaters in twenty-one cars not having them at present.

Passaic Gas Case Closed

The Public Service Gas Company, controlled by the Public Service Corporation of New Jersey, has decided to make no further effort to restore the rate of $1 per thousand cubic feet for gas and, after a formal motion before the United States Supreme Court, the appeal which had been made to that court was dismissed. An agreement to this effect was reached by counsel representing the gas company, the New Jersey Board of Public Utility Commissioners and the cities of Passaic and Paterson, all of which were parties to the litigation. In explanation of this action President Thomas N. McCarter of the company stated substantially as follows:

When the order of the Board of Public Utility Commissioners, effective Feb. 1, 1913, was made, fixing the price of gas at 90 cents per thousand cubic feet, the ruling was very burdensome; in fact, it was considered confiscatory of the company's property. The litigation in regard to the order, due to no fault of the company, has been very protracted, four years having elapsed since the order was made. Latterly due to the growth of the business and certain other features connected therewith the burdensome features of the rate have been lessened. The company decided that even if it won the case it would not go back to the dollar rate. Under these conditions it was not proper to present the case to the court as the only effect of a favorable decision would be to obtain an opinion of the court and not a judgment to be put into force.

Cleveland Paving Case Decided.—Common Pleas Court rendered a decision on Jan. 22 to the effect that the Cleveland Railway must pave the space occupied by its tracks on Euclid Avenue through East Cleveland and that the work must be begun by June 1. The city and county laid their portions of the pavement last fall, but the remainder is in the condition left at that time. The company claims that East Cleveland enjoys the same rate of fare as is paid in Cleveland and that it should not expect it to build pavement, when the Cleveland franchise does not demand it. However, the East Cleveland franchise does contain this stipulation.

Publication of Toledo Plan Postponed.—On request of Henry L. Doherty, of Henry L. Doherty & Company, who operate the Toledo Railways & Light Company, the Street Railway Commission of Toledo, Ohio, has decided to delay publishing the proposal prepared as a solution of the franchise question until Mr. Doherty has filed suggested changes in certain portions. He wired the commission that the company could not accept some portions of the plan as they stand, and would prefer that no publication be made until he could suggest changes. These he will submit in the shape of redrafts. Mr. Doherty has been unable, because of illness, to be in Toledo for some time.

Commission Seeks to Compel Compliance With Its Order.—Assistant District Attorney Unger, acting on a complaint filed by the Public Service Commission, has started a proceeding before Justice Freschi of Special Sessions, sitting as a Magistrate, to punish the officials of the Third Avenue Railway, the Belt Line Corporation, and the Forty-second Street, Manhattanville & St. Nicholas Avenue Railway, New York, N. Y., for failure to comply with an order issued by the commission last April. The three companies were represented by Joseph H. Choate, Jr., who said his clients had endeavored to comply with the requirements of the order, but were prevented by the torn-up conditions of one of the streets. The court ordered both sides to submit briefs.

Abandonment of Gettysburg Line Proposed.—What is believed to be the first step in the abandonment of the electric railway on the Gettysburg Battlefield at Gettysburg, Pa., has been taken in the introduction of a bill in Congress authorizing the purchase of the right-of-way in the National Military Park and carrying an appropriation of $30,000 for the purpose. It is understood that the bill has the approval of the National Park Commission, which never has regarded the presence of the electric railway on the field with special favor. The cars have been run in a more or less desultory fashion for twenty-three years. For the last two years only one car has been used to cover the route. Except in years of National Guard encampments or big reunions, the line has never been operated at a profit.

Abandonment of State Railway Urged.—The State of North Dakota will abandon the street railway business, will surrender the charter under which it operates in Bismarck and will dispose of the present so-called Capital Car Line for the purpose of repaying to the Capitol building fund, moneys expended in the construction of the line, if the Legislature acts in accordance with an opinion filed by Attorney-General William Langer with the State Budget Commission. The opinion, prepared by Assistant Attorney General Dan V. Brennan, holds that the State of North Dakota is engaged in the street railroad business in contravention of the provision of the constitution. The Capital Car Line is 1.5 miles long. It was built to afford a permanent means of conveyance between the Capitol grounds and the railroad station. One car is operated.

Market Street Line, San Francisco, Authorized. — After the Board of Supervisors of San Francisco, Cal., had passed for print on Jan. 28 a resolution which authorized the immediate construction on Market Street of the Twin Peaks tunnel line by the city James E. Powers offered a resolution providing for the purchase of all the holdings of the United Railroads of San Francisco by the city as the "best solution of transportation problems." The resolution was not discussed. At the meeting of the supervisors at which this resolution was presented a letter was read from Jesse W. Lilienthal, president of the United Railroads, in which he asked the supervisors to delay action on the additional line until the city engineer and the general manager of the United Railroads had an opportunity "to confer with a view to devising some plan that will provide for a fair solution of pending transportation problems."

Pacific Electric Club Opens Headquarters.—The Pacific Electric Club, composed of employees of the Pacific Electric Railway, Los Angeles, Cal., opened new quarters in Los Angeles last month, with a three-day celebration. The new club headquarters are at 431 South Hill Street, adjoining the Hill Street station, and occupy two entire floors of the building. The company provided $25,000 with which to fit up the quarters, which include all conveniences of modern club rooms. Arrangements have been made so that wives of employees may use the club rooms, and facilitate shopping excursions by having parcels delivered to the club. There are pool and billiard rooms, a library, a kitchen, lounging rooms and large halls specially arranged for dancing. F. L. Annable, general superintendent of the railway, is president of the club, and Ed. Thomas, manager of the traffic department of the company, is the secretary.

Mr. Dempsey Convicted of Violating Commission Order.—John J. Dempsey, superintendent of elevated transportation of the Brooklyn (N. Y.) Rapid Transit Company, was found guilty, on Feb. 6, by a jury before Judge Roy in the Kings County Court on charges of violating an order of the Public Service Commission issued in 1912. Mr. Dempsey's is the first conviction under the law which makes a violation of a Public Service Commission order a misdemeanor. The maximum penalty is a year in prison or a fine of $500 or both. Mr. Dempsey's indictment followed the failure of elevated express trains of the Brooklyn Rapid Transit Company to make the Third Street station stop on the Fifth Avenue line. The Public Service Commission, after a hearing, ordered the stop made, but the company argued it was unable to do so because of another Public Service Commission order which limited the running time of trains to Manhattan. Mr. Dempsey will be sentenced on Feb. 12. His $1,000 bail was continued.

Partnership Agreement Suggested in Kenosha.—S. B. Way, vice-president of the Wisconsin Gas & Electric Company, which operates the street railway lines in Kenosha, Wis., has proposed to Mayor Pfennig that the city share equally in the profits of the company above 6 per cent. The company in return asks the co-operation of the city in making the company a paying concern. Mr. Way declared that the line had been operated at a loss for the last three years. According to the plan as outlined by Mr. Way, the company will be permitted to pay overhead and operating expenses and an annual dividend of 6 per cent to its stockholders. All profits above this amount, minus 20 per cent to be given as bonuses for employees of the company actually operating the lines, will be divided equally between the city and the company. The only demand made upon the city is that it co-operate with the company to secure the most profitable possible operation of the lines. The company has placed the physical valuation of the lines, the basis for profit, at $375,000. This is less than the company paid for the property when it was purchased four years ago.

Cincinnati Loop Arrangement Protested.—W. L. Woodward, chairman of the transportation committee of the Federated Improvement Associations, of Cincinnati, Ohio, recently sent a letter to the Rapid Transit Commission, calling attention to the failure of the commission to include in the proposed lease to the Cincinnati Traction Company any agreement for a 5-cent fare on all interurban cars within the city limits, a restricted transfer system on the Millcreek Valley route and omission of a fixed charge for interest and sinking fund charges on the rapid transit bonds. Mr. Woodward claims that, as it stands, the lease makes the Cincinnati Traction Company a preferred creditor against the city and insures it against loss. He also objected to a fixed annual franchise tax of $325,000 for the company, in place of the present 6 per cent basis, on the ground that all the money is used for repair of streets over which the company's tracks run and that the amount should increase in the same proportion as the company's gross receipts. In reply to an inquiry, Mr. Woodward said his letter was not approved by the transportation committee, but that it embodied the sentiments of members expressed at a recent meeting. It was referred without comment to the conference committee of the City Council.

Financial and Corporate

New York Franchise Taxes Raised

State Board Reports Increases of $34,362,900 in New York City

The State Tax Commission of New York made public on Jan. 29 the special franchise valuations for 1917 for New York City. In a note of explanation the commission says:

"In the systems embracing operated and affiliated companies taken as a whole, with the exception of the Third Avenue Railway, there have been substantial increases, although some of the individual companies within the systems have been reduced."

The total of special franchise tax valuations for New York City, the State Commission says, is $494,231,250. This is an increase of $34,362,900 over the preceding year. Detailed valuations of the principal electric railway properties follow:

	1917	Increase
Brooklyn Rapid Transit system	$46,396,000	$3,352,100
New York Railways system	28,000,000	*1,439,000
Third Avenue Railway system, total	20,096,000	*5,344,000
Manhattan Railway—		
Bronx Borough	6,450,000	*2.808,000
Manhattan Borough	63,400,000	3,323,000
Richmond Light & Railroad Co	1,600,000	600,000
Hudson & Manhattan Railroad	8,234,000	......
Pennsylvania Tunnel & Terminal Co	17,478,800	412,200

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*Indicates decreases.

1916 Financing in Great Britain

Government Borrowings Overshadow All Else—No New Tramway and Omnibus Capital Raised

In its annual summary of British new financing, the London *Economist* shows that the control exercised by the treasury committee over new issues had even a stronger effect in 1916 than in the year preceding, for apart from British Government borrowing and subscriptions in London to the second French loan, only about £16,000,000 out of £585,436,400 was raised. Of this about £6,500,000 was raised by the colonial governments, so that the utility, industrial and other companies secured less than £10,000,000 during the year.

The following analysis shows the various purposes to which the new capital created was devoted:

Description	1916	1915
British Government	£554,071,100	£614,250,700
Colonial Government	6,500 000	17,385,000
Foreign Governments	15,000,000	38,450,000
British municipalities	495,000	....
Colonial corporations	....	350,000
Foreign corporations	....	....
British railways	1,679,000	3,294 000
Indian and colonial rails	....	3,965,000
American railways	....	....
Foreign railways	384,000	2 940,000
Mining companies:		
Australian	7,500	....
South African	....	....
Other mines	15,000	21,500
Exploration and financial	....	45,000
Breweries and distilleries	....	....
Merchants, etc	102,500	....
Manufacturing	1,449,300	1,807,500
Stores and trading	....	....
Estate and land	....	25,000
Rubber	15,600	152,700
Oil	1 573,500	22,100
Iron, coal, steel, etc	1,275,000	162,900
Electric lighting, power, telegraph, etc.	102,400	546,900
Tramways and omnibus	....	432,500
Motors	381,300	130,000
Gas and water	16,400	20,000
Hotels and theaters, etc	7,000	78,700
Patents	27,000	....
Docks and shipping	800,000	580,000
Banks and insurance	275,000	266,200
Miscellaneous	1,259,800	316,000
	£585,436,400	£685,241,700

From the foregoing figures it appears that new capital issues for tramways and omnibus lines decreased from £432,500 in 1915 to nil in 1916, while the new issues for electric lighting, power, telegraph, etc., companies dropped from £546,900 to £102,400. Big increases, however, were apparent for oil companies, iron, coal and steel companies, and miscellaneous organizations.

Annual Report

Lehigh Valley Transit Company

The comparative income statement of the Lehigh Valley Transit Company, Allentown, Pa., for the years ended Nov. 30, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Passenger revenue	$1,852,506	74.9	$1,550,125	75.4
Other transportation revenue	115,002	4.7	99,297	4.8
Revenue from other railway operations	504,363	20.4	407,453	19.8
Total operating revenue	$2,471,871	100.0	$2,056,875	100.0
Operating expenses	1,433,665	58.0	1,130,835	55.0
	$1,038,206	42.0	$926,040	45.0
Taxes	84,445	3.4	73,552	3.6
Operating income	$953,761	38.6	$852,488	41.4
Non-operating income	145,209	5.8	136,146	6.6
Gross income	$1,098,970	44.4	$988,634	48.0
Deductions from gross income	630,493	25.5	665,246	32.3
Net income	$468,477	18.9	$323,388	15.7

In view of the unprecedented economic conditions, which greatly increased all labor and material costs entering into maintenance and operation, the foregoing showing for the last year was considered most satisfactory. Revenue from transportation increased $318,086 or 19.2 per cent, power sales advanced $96,473 or 24.2 per cent, and total operating revenue increased $414,996 or 20.1 per cent. Operating expenses, however, rose $302,830 or 26.8 per cent, and taxes $10,893 or 14.8 per cent. Yet the final result was an increase of $145,089 or 44.8 per cent in net income.

Dividends of $248,983, equivalent to 5 per cent on the preferred stock outstanding, were disbursed. The last fiscal year was the first time that the company paid the full 5 per cent dividend on its preferred stock. At the same time it was able to add to its surplus account, which now stands at $560,200, an increase of 62.7 per cent.

Beginning with the fiscal year 1911 there has been credited each year to maintenance, renewals and depreciation an amount equal to 22 per cent of the gross earnings of the railway lines. All items of maintenance and renewals are charged to this account, the balance being set up to accrued depreciation reserve. This showed a credit of $293,241 as of Nov. 30, 1916.

The operation of jitneys in the company's territory declined remarkably during the year, it is said, and could not be considered as a competitive factor. A fast and reliable freight service is operated by the company connecting with the Philadelphia Rapid Transit Company at Chestnut Hill, Philadelphia. The surplus from the freight business in the last year increased $2,905 or 18.9 per cent. The operation of the Adams Express Company over the company's lines resulted in an increase of $1,288 in the surplus from its business or 13.9 per cent.

Returns for Montana Lines

The latest report of the Montana Board of Railroad Commissioners, which is *ex-officio* the Public Service Commission of the State, contains tables showing the investment in plant and equipment, operating revenues and operating expenses of Montana street railways for the year ended June 30, 1916. These tables are partly reproduced herewith. It should be noticed that for combined lighting and railway properties only transportation data are included.

STATISTICS FOR MONTANA ELECTRIC RAILWAYS FOR YEAR ENDED JUNE 30, 1916

	Plant and Equipment	Operating Revenue	Operating Expenses†	Per Cent Operating Net to Investment
Anaconda C. M. Co	$313,727	$132,334	$98,369	10.82
Billings Traction Co	120,955	23,761	28,917	0.00
Butte Electric St. Ry	2,514,664	550,037	502,639	1.88
Montana Power Co	*......	137,474	76,853	*...
Helena L. & Ry Co	*......	85,874	82,981	*...
Missoula St. Ry	666,990	73,002	74,177	0.00

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*Railway figures not separately reported.
†Includes taxes and depreciation.

Terms of Texas Merger

Capitalization of Texas Electric Railway, a Consolidation of the Texas Traction Company and the Southern Traction Company, Totals $19,660,000

With practically all stock represented, either in person or by proxy, stockholders of the Texas Traction Company and the Southern Traction Company, at a meeting in Dallas, Tex., on Jan. 30, voted unanimously to approve the terms of consolidation of the two companies into the Texas Electric Railway. As noted in the ELECTRIC RAILWAY JOURNAL of Feb. 3, page 225, of the 30,000 shares of stock of the Texas Traction Company outstanding, 26,820 shares were represented at the meeting, and of the 70,000 shares of Southern Traction Company stock outstanding, 67,298 shares were represented.

J. F. Strickland, president of the two companies, was elected president of the newly formed company. Other officers of the Texas Electric Railway were elected as follows: Vice-presidents, Osce Goodwin, Dallas; R. B. Stichter, Dallas; C. W. Hobson, Dallas; J. L. Penn, Waxahachie; F. N. Drane, Corsicana; W. J. Neale, Waco; W. R. Brents, Sherman; J. S. Heard, Dallas; H. I. Gahagan, Dallas; and Burr Martin, Dallas; secretary and assistant treasurer, James P. Griffin, Dallas; assistant secretaries, J. C. Thompson, Corsicana; C. L. Cox, Dallas, and W. H. Painter, Dallas; treasurer, H. I. Gahagan, Dallas; general manager, Burr Martin, Dallas.

The directors of the company are J. F. Strickland, Osce Goodwin, George W. Bowman, W. R. Brents, J. L. Lovejoy, S. D. Moore, W. B. Munson, R. B. Stichter, R. L. Waddell, A. A. Jackson, C. B. Dorchester, W. W. Batcheler, F. N. Drane, W. D. Lacy, W. J. Neale, W. W. Seley, J. L. Penn, J. H. Miller, A. L. Smith, George W. Coleman and M. B. Templeton. The members of the executive committee are J. F. Strickland, Osce Goodwin, T. J. Cole, R. E. L. Saner, John N. Simpson, J. S. Heard and C. W. Hobson.

The total of authorized capitalization of the Texas Electric Railway is $19,660,000, as follows: first preferred stock, $1,500,000; second preferred stock, $3,000,000; common stock, $6,000,000; twenty-five-year 6 per cent convertible debentures, $2,160,000; first and refunding 5 per cent bonds, $4,804,000; divisional underlying bonds, $2,196,000.

TERMS OF MERGER

The terms of the merger approved by the stockholders include the following:

1. Of the $1,500,000 of first preferred stock of the Texas Electric Railway $700,000 will be used to purchase, acquire or discharge obligations of the Texas Traction Company and the Southern Traction Company, and the remaining $800,000 will be held in the treasury to provide for future betterments, improvements and extensions.

2. Of the $3,000,000 of second preferred stock of the company $1,200,000 will be delivered to the Texas Traction Company and $1,800,000 to the Southern Traction Company, for distribution among their preferred stockholders at the following ratios: $120 par value of second preferred stock of the Texas Electric Railway for each $100 par value of the preferred stock of the Texas Traction Company, and $107.20 par value of second preferred stock of the Texas Electric Railway for each $100 par value of preferred stock of the Southern Traction Company.

3. Of the $6,000,000 of common stock of the company $2,000,000 will be delivered to the Texas Traction Company and $4,000,000 to the Southern Traction Company for distribution among their stockholders in the following ratios: $100 par value of common stock of the Texas Electric Railway for each $100 par value of common stock of Texas Traction Company, and $80 par value of common stock of Texas Electric Railway for each $100 par value of common stock of the Southern Traction Company.

The Texas Electric Railway also authorized an issue of first and refunding mortgage 5 per cent gold bonds to the amount of $4,804,000, and twenty-five-year 6 per cent convertible debentures to the amount of $2,160,000, subject to present outstanding divisional and underlying bonds to the amount of $2,196,000. The proceeds of the first and refunding bonds and the debentures will be used in refunding or discharging present outstanding bonds of the Southern Traction Company and also in refunding or discharging present outstanding gold notes of the Texas Traction Company to the amount of $700,000.

EXTENT OF SYSTEM

The Texas Electric Railway extends north from Dallas through McKinney and Sherman to Denison; from Dallas southeast to Corsicana and from Dallas south through Waxahachie to Waco. The company also does the entire street railway business in Waco, Denison, Sherman, Corsicana, Waxahachie and McKinney. The company operates a total of 259 miles of main track, of which it owns 249 miles. The total mileage, including second track, yard track, etc., owned by the company is more than 267 miles. Power is purchased from the Texas Power & Light Company under long-time contracts.

Merger Proposed in Reading

Reading Transit & Light Company and Metropolitan Electric Company Propose to Take Over Leased Properties

Announcement was made in Reading on Feb. 5 by officials of the Reading Transit & Light Company that an application will be made to the Public Service Commission of Pennsylvania on Feb. 20 for approval of the proposed purchase of the controlling interest in the United Traction Company. The Metropolitan Electric Company has made similar application for the approval of the purchase of the Edison Electric Illuminating Company and the Lebanon Valley Electric Light Company, both of Lebanon, Pa. The Reading Transit & Light Company on Feb. 5 authorized the following statement:

"This is the first step in a plan which will establish the financial strength of our companies on such a basis as to make possible the development and extension of the railway and electric service in Reading and vicinity in a manner and on a scale in keeping with the progressiveness of this district.

"The properties we operate are leased by us for long terms. The acquisition of these properties would avoid the payment of rentals. The leases of the various properties contain options giving us the right to buy, but these leases do not expire for many years. At the present time we have no idea when and how these options might be exercised, and the steps taken at this time are only preliminary to the possible development of a plan along these lines. The exercising of the options would, of course, depend upon whether the Public Service Commission feels, as we do, that it would be to the best interests of the people of Reading and vicinity in general to have us do so.

OUTLINE OF PLAN

"The plan is to have the Metropolitan Electric Company acquire a controlling interest in the Edison Electric Illuminating Company, the Pennsylvania Utilities Company and the Lebanon Valley Electric Light Company. This does not mean a change in the ownership of these companies. At the present time they are controlled by the same financial interests as the Metropolitan Electric Company, and the transferring of the control of these companies to the Metropolitan would result in economies in the operation and management of all of the properties, as the Reading organization, with very little expense, can be expanded to take care of these properties. All of the electric properties in and about Lebanon are at the present time connected with the large generating station of the Metropolitan Electric Company at West Reading by transmission line.

"Whe West Reading plant is susceptible of development on an unlimited scale and will continue to be the logical center of a large power supply. The capacity of the West Reading plant has been greatly augmented during the past year by improvements and additions which have doubled the capacity of the plant, and contracts have recently been let for still further improvements and additions which will again double the present capacity of the plant by the year 1918."

New Holding Company Planned

National Utilities Company Will Take Over the National Properties Company, National Gas, Electric Light & Power Company and the Jersey Central Traction Company

The National Utilities Company has been incorporated under the laws of Delaware to bring under one management the National Properties Company, the National Gas, Electric Light & Power Company, and the Jersey Central Traction Company. The National Utilities Company will have authorized stock issues of $10,000,000 each of common and preferred stocks and will market $2,500,000 of three-year 6 per cent notes. For the present only $4,000,000 of common and $3,000,000 of preferred stock will be issued. The consolidation is being effected by the banking firms of Bioren & Company and Newburger, Henderson & Loeb. The firm of Hecker & Company is interested in the National Gas, Electric Light & Power Company, which is to form an important part of the proposed merger.

Owners of the preferred stock of the National Gas, Electric Light & Power Company may exchange their holdings on the basis of 90 per cent in new 6 per cent collateral trust bonds of that company and 10 per cent in preferred stock of the new holding company. Holders of the common stock will receive $47.64 in cash, $30 in 6 per cent notes of the holding company and $20 in common stock for each share of their present common stock holdings. It is not stated what holders of National Properties Company stock or those of Jersey Central Traction Company will receive. Holders of shares of the National Gas, Electric Light & Power Company must deposit their stocks with the bankers interested on or before Feb. 15 in order to take advantage of the offer. The proposed arrangement is contingent upon a sufficient number of both classes of shares being deposited.

Van Horn Ely, president of the National Properties Company and its subsidiary, the American Railways, will continue in active charge of the various properties and companies.

The companies included in the merger operate 623 miles of street railways and supply electric light and power to more than fifty cities and towns and gas to eleven cities. Their combined gross earnings for the year 1916 amounted to $9,327,702.

Cleveland Fare Increase Inevitable

At the annual meeting of the Cleveland (Ohio) Railway on Jan. 31, President J. J. Stanley told the board of directors that an increase in the rate of fare is inevitable. Mayor Harry L. Davis had previously suggested through the newspapers that an election be held in 1918 to vote on a bond issue for the purpose of taking over the property. This, in effect, was President Stanley's reply. Mayor Davis had publicly avowed that the service must be improved or the city would take over the property, and he was answered by Mr. Stanley in a published statement that the city could buy the stock of the company at $110 whenever it liked, under the terms of the Tayler franchise.

President Stanley stated at the board meeting that he will ask Council for an increased operating allowance, as the advance in the cost of materials and labor has made this necessary. Should Council refuse, the question, under the franchise, may be taken before a board of arbitration.

In regard to the statement of President Stanley, Commissioner Sanders said it is obvious that an increase in fare must come in time, as materials are costing 40 per cent more than formerly, but the practice of strict economy, he believes, will postpone the necessity for making an increase for a year at least. He said he would be opposed to making an increase at this time.

The annual report submitted at the meeting showed gross receipts of $9,597,306; expenses, $7,044,432; taxes, $579,423; interest, $1,912,815; surplus, $60,635. The increase in the gross receipts amounted to $1,054,993. The total number of passengers carried was 375,382,748, an increase of 12 per cent over 1915. The big day was Dec. 23, when 1,351,985 passengers were carried.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—Plans are being made to incorporate a new street railway to acquire the franchise of the Dunkirk (N. Y.) Street Railway, now held by the Buffalo & Lake Erie Traction Company. The Dunkirk Street Railway operates a belt line service around the city, but for some time past efforts have been made by the Buffalo & Lake Erie Traction Company to abandon this route, which it contended was unprofitable. Several conferences have been held by the City Council of Dunkirk and representatives of central New York interests who are fostering the project. The Council appears to be willing to grant a new franchise to the new company provided a fifteen-minute service is maintained. This is said to be agreeable to the representatives of the proposed company.

Detroit (Mich.) United Railway.—At the annual meeting of Detroit United Railway on Feb. 6, all retiring directors and officers were elected. The stockholders approved an increase in the capital stock of the company from $12,500,000 to $25,000,000, and the board took action offering $2,500,000 of the new stock to stockholders of record of Feb. 16 at par in the proportion of one share of the new stock for each five now held. Subscription rights will expire on March 29.

Lehigh Valley Transit Company, Allentown, Pa.—Negotiations are reported to be under way for consolidating the Lehigh Navigation Electric Company, owned and controlled by the Lehigh Coal & Navigation Company, and the Lehigh Valley Transit Company. The deal has for its object the combining of all the power plants of these two companies into one central power system, increasing the power plant of the Lehigh Navigation Electric Company at Hauto and enlarging the Allentown plant of the Lehigh Valley Light & Power Company, which is controlled by the Lehigh Valley Transit Company.

Los Angeles (Cal.) Railway Corporation.—The City Railway, Los Angeles, has filed with the California Railroad Commission an application for authority to issue $303,000 par value of bonds and to deliver the same to the Los Angeles Railway Corporation in payment of moneys advanced and invested in the plant of the City Railway. The company says that it had an investment of $3,893,000 in its system before making the additional investment of $303,433, and that in accordance with the provisions of its trust deed it wishes now to sell these additional bonds, the money for which was obtained from the Los Angeles Railway Corporation.

Shore Line Electric Railway, Norwich, Conn.—A lengthy bill amending the charter of the Shore Line Electric Railway has been introduced in the Legislature of Connecticut. The bill provides for the dissolution of the Norwich & Westerly, the Groton & Stonington and the New London & East Lyme Street Railways and joins them under the title of the Shore Line Electric Railway. Provision is also made for the operation of street railways by the company in Rhode Island. It is also provided that the Shore Line Electric Railway shall have power to sell energy for commercial purposes. The bill further provides for the increase of the company's capital stock to an amount not exceeding $8,000,000. The company has outstanding at present $300,000 of preferred stock and $700,000 of common stock. It operates under lease the New London division of the Connecticut Company, controlled by the New York, New Haven & Hartford Railroad, which under the requirement of the United States Department of Justice is obligated to dispose of its electric railway holdings in both Connecticut and Rhode Island within a period of five years from Nov. 7, 1914.

St. John (N. B.) Railway.—The St. John Railway, controlling tramways, electric light, power and gas in St. John, has called a special meeting of stockholders to consider an offer to purchase the entire assets of the company. The New Brunswick Investment Company, Ltd., formed for the purpose, has offered $1,300,000 for all the company's properties and franchises and in addition $10 a share for each share transferred, making a total of $140 per share net to the shareholders. The circular says: "The directors are of the opinion that the offer should be accepted."

United Service Company, Scranton, Pa.—The DuBois (Pa.) Traction Company has been taken over by the Keystone Utilities Company, a holding company which has recently been formed to acquire various public utilities. The United Service Company has an operating agreement with the Keystone Utilities Company to operate the DuBois property, and for this reason the management of the DuBois company will be charged to the United Service Company. The local manager, R. B. Blakeslee, will continue as resident manager in DuBois.

Dividends Declared

Boston (Mass.) Elevated Railway, quarterly, 1½ per cent.

Bristol & Plainville Tramway, Bristol, Conn., quarterly, 2 per cent.

Connecticut Railway & Lighting Company, Bridgeport, Conn., quarterly, 1 per cent, preferred; quarterly, 1 per cent, common.

Duluth-Superior Traction Company, Duluth, Minn., quarterly, 1 per cent, preferred.

Lincoln (Neb.) Traction Company, quarterly, 1½ per cent, preferred.

Pacific Gas & Electric Company, Sacramento, Cal., quarterly, 1½ per cent, original preferred; quarterly, 1½ per cent, first preferred.

Electric Railway Monthly Earnings

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$176,571	*$123,253	$53,318	$35,856	$17,462
1 " "	'15	154,561	*104,075	50,486	36,478	14,008
12 " "	'16	2,056,362	*1,380,868	675,494	433,911	241,583
12 " "	'15	1,909,544	*1,302,702	606,842	436,166	170,676

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$87,477	*$57,445	$30,032	$27,550	‡$2,618
1 " "	'15	73,105	*78,317	†5,212	22,358	‡†27,358
6 " "	'16	541,664	*426,471	115,193	166,006	‡†49,724
6 " "	'15	498,746	*400,203	98,543	106,885	‡†7,299

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$336,954	*$200,513	$136,441	$43,565	$92,876
1 " "	'15	300,315	*164,527	135,788	41,189	94,599
12 " "	'16	3,537,399	*2,105,124	1,432,275	516,373	915,902
12 " "	'15	3,113,175	*1,846,437	1,266,738	476,281	790,457

CONNECTICUT COMPANY, NEW HAVEN, CONN.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$808,198	*$682,285	$125,913	$103,218	‡$45,262
1 " "	'15	704,552	*477,524	227,028	99,722	‡150,413
6 " "	'16	5,070,883	*3,897,273	1,173,610	591,109	‡748,405
6 " "	'15	4,452,422	*2,974,355	1,478,067	592,736	‡1,024,591

LEWISTON, AUGUSTA, & WATERVILLE STREET RAILWAY, LEWISTON, ME.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$63,270	*$50,711	$12,559	$15,401	†$2,842
1 " "	'15	57,929	*40,889	17,040	15,942	1,098
12 " "	'16	803,660	*553,296	250,364	187,773	62,591
12 " "	'15	737,850	*475,422	262,428	189,839	72,589

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$216,914	*$124,162	$92,752	$42,128	$50,624
1 " "	'15	204,364	*116,881	87,483	42,946	44,537
12 " "	'16	2,383,041	*1,453,188	929,853	508,971	420,882
12 " "	'15	2,143,903	*1,318,834	825,069	510,587	314,482

NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$49,155	*$55,436	†$6,281	§$9,935	‡†$14,900
1 " "	'15	42,794	*46,228	†3,433	§5,540	‡†7,641
6 " "	'16	308,464	*287,024	21,440	§41,702	‡†14,152
6 " "	'15	257,135	*254,386	2,749	§36,000	‡†23,681

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$512,594	*$257,702	$254,892	$183,084	$71,808
1 " "	'15	482,938	*255,280	227,658	182,824	44,834
12 " "	'16	5,483,110	*3,038,254	2,444,856	2,178,258	266,598
12 " "	'15	5,511,345	*3,073,628	2,437,717	2,208,356	229,361

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$481,638	*$389,007	$92,631	$119,634	‡†$26,107
1 " "	'15	440,663	*350,340	90,323	120,150	‡†28,149
6 " "	'16	3,083,384	*2,204,373	879,011	721,628	‡191,520
6 " "	'15	2,756,262	*2,047,156	709,106	722,286	‡21,776

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*Includes taxes. †Deficit. ‡Includes non-operating income. §Excludes interest on bonds, charged income and paid by the New York, New Haven & Hartford Railroad under guarantee, also interest on notes held by the New York, New Haven & Hartford Railroad, not credited to income of that company.

Traffic and Transportation

Los Angeles Fare Case Dismissed

California Commission Decides in Favor of Company —Extension of City Boundary Does Not Work Automatically to Decrease Fares

The Railroad Commission of California has dismissed the applications of Palms, Richardson, Bairdstown, and certain sections of Hollywood, to reduce fares on the Pacific Electric Railway, Los Angeles, to a 5-cent basis. The commission says that if the desired reduction were made, the Pacific Electric Railway would further lose $300,000 a year, and that such a condition would be created as to make operation of the road much more burdensome. The Southern Pacific Railroad owns all of the Pacific Electric Railway stock and a great amount of its bonds. The commission says that only because of this ownership has the Pacific Electric Railway been able to support the losses caused by jitney competition. The jitney losses and the $821,734 of the actual loss sustained in 1916 would create an annual deficit in excess of $1,000,000. The commission believes that the situation would have been worse had not the freight earnings of the Pacific Electric Railway increased $500,000 in 1916 over 1912. The commission found that the income of the Pacific Electric Railway has been decreased between $30,000 and $40,000 a month as a result of jitney competition. On this point the opinion of the commission says:

"It must be obvious that the company cannot, when showing such great deficit, be expected to give improvements in service which might otherwise be properly required or reduce fares still lower, thereby increasing its already severe losses. The evidence shows that the present fares do not give the Pacific Electric Railway sufficient revenue to meet its current expenses."

THE COMMISSION'S OPINION

In rendering its decision the commission said in part:

"The population of Los Angeles for 1910 was 319,198; in 1912, estimated on basis of registration, it was 461,558, and on the same basis for 1915 it was 558,011, but notwithstanding this great increase in population, defendant's passenger revenue shows practically no improvement, being $6,677,289 in 1912, as compared with $6,705,708 in 1916, a difference of only $28,419.

"For the transportation of milk the revenue in 1912 was $41,569, in 1916 it was $4,939, a net loss of $36,629. The total of all traffic handled by passenger trains in 1912 was $6,882,654, and in 1916 only $6,880,742, or a net reduction at the end of the five-year period of $1,911. The freight earnings, however, increased from $1,112,683 in 1912 to $1,656,067 in 1916, or $543,384. During the same period taxes increased from $320,698 in 1912 to $515,556 in 1916, an excess of $194,857. Interest on funded debt increased from $2,081,607 in 1912 to $2,834,107 in 1916. New bonds amounting to $15,066,000 were issued in conformity with this commission's decisions, these including bonds for refunding, as well as for improvements, additions and betterments. It is also to be noted that the interest on unfunded debt increased from $114,337 in 1912 to $254,192 in 1916.

"The defendant has never paid a dividend and shows, as of June 30, 1916, a deficit of $4,432,855. In the year 1912 there was a net income profit of $496,216; in 1913, a profit of $199,871; in 1914, a loss of $467,220; in 1916, a loss of $683,521, and in 1916 a loss of $821,734.

"While it would be advantageous to certain residents and property owners of the districts affected by these proceedings to secure reductions in the present fares, the public in general, as well as the carrier, have an interest in the margin of safety due to a public utility and, therefore, this commission must and will take into consideration not only these complainants, but the rights of defendant and all other interests served by this defendant, whose legitimate investments should not be injured.

"The mere fact that territory is annexed to a city does not automatically operate to reduce existing fares which are higher than 5 cents to 5 cents, if the higher fares are justifiable. This rule has been previously declared by this commission in Froelich vs. Los Angeles Railway Corporation.

"Complainants have not proved the rates to be discriminatory; neither has it been shown that the districts in question furnish a traffic of sufficient volume to justify a street car fare of 5 cents, and the commission finds that the charges and fares to the points and places designated in the complaints herein, which were lawfully in effect on Nov. 3, 1914, are justified.

"This commission can only prescribe just and reasonable rates and, after careful deliberation upon all the elements in these cases and the effect upon the revenue which would result from the reductions demanded by complainants, I am of the opinion that the facts do not sustain the complaints and recommend that the cases be dismissed."

Chicago Paper Studies Car Delays

The Chicago *Herald* has recently been making a survey of the causes for street car delays during rush hours in Chicago. Starting out with the announcement that it intended to investigate this subject, in view of the wide discussion about delayed traffic, the paper assigned reporters to ride on the cars on different routes and report on the nature and length of all delays. Then for several days it printed a column or more of specific information showing just what car operators have to meet in making their rush-hour runs.

In general, the evidence showed that the drivers of automobiles, trucks and other vehicles use the car tracks freely, either because of a willful or careless disregard for car operation or because of the parking of automobiles along the curb, so as to leave not much more than the tracks open. In practically all cases the delay could have been avoided if vehicular traffic had not been on the tracks. The survey may aid materially in the execution of recommendations made in the report of the Chicago Traction & Subway Commission for an ordinance prohibiting the unnecessary use of tracks by vehicles in rush hours.

In closing its campaign of education the *Herald* published a signed statement by Leonard A. Busby, president Chicago Surface Lines, who explained the problems of operation in the loop district. Mr. Busby said that the speed of surface cars is cut down 40 per cent through the loop during the morning and evening rush hours because of teams on the tracks and automobiles parked beside the curb. As for blockades, those resulting from teams and automobiles becoming stalled in the street or broken down on the tracks are greater than all others combined. The records of the operating department show that 56 per cent of all blockades which are of a nature serious enough to require the services of a wreck wagon are due to the breaking down of vehicles on the track, or to the overloading of vehicles which get on the track and cannot get off without the services of a wreck wagon. The other blockades requiring the services of a wreck wagon are due to derailment, fires, overhead troubles and miscellaneous causes.

These figures, Mr. Busby said, do not take into account the vastly greater volume of delays due to vehicles holding the track, thereby delaying the cars and making the headway irregular. Nor do they take into account the fact that in the congested districts where cars are operated up to track capacity about 25 to 30 per cent of the actual track capacity on a given street during rush hours is at times used by vehicles which displace a large number of cars. These, then, are obliged to stand in line waiting for an opportunity to get through.

This condition is growing steadily worse, Mr. Busby stated. Clearing the tracks of vehicles in the congested district during the rush hours would at the present time afford greater relief to the public than could be obtained by any other measure under existing track facilities. This would, of course, involve the necessity of preventing the parking of automobiles and other vehicles along the curb on narrow streets.

Year's Effect of the Seattle Jitney

Many Jitneys Are Still in Operation, but This Problem Is Secondary to That of High Cost of Materials

The long-expected demise of the jitney as an agent of transportation in Seattle, Wash., has failed of accomplishment, according to the annual report presented to the Mayor of that city by A. L. Valentine, superintendent of the city department of utilities and covering a period from Nov. 30, 1915, to Nov. 30, 1916. The report says:

"Two hundred and seventy-five jitneys are still doing business during the evening rush period, lesser number by about seventy-five than were in operation at the time of the filing of our last report. During the summer months, at a time when prohibitive legislation seemed imminent, and when the price of the required $2,000 bond had soared from $175 to $250 per annum, there was a noticeable falling off in the number in operation, but this condition did not long endure, and during the last few months the number has been slowly increasing. Applicants for drivers' licenses are being constantly examined and passed upon, and if the older drivers are learning that the business cannot be conducted at a sufficient profit, if the increasing industrial activity is drawing numbers of them to more lucrative fields of endeavor, there is, nevertheless, no lack of new material to take their places and continue where they left off. A total of 749 applicants were examined for licenses during 1916. Beyond the raising of the fares on certain of the routes, there have been no changes or improvements of note. None of the consolidations of drivers has succeeded in holding together to any definite purpose; none of the promised capital which was to take hold of the industry, conduct it on a large scale and give it a definite status, has materialized.

"During the year ending Dec. 1, 1915, the gross railway receipts of the Puget Sound Traction, Light & Power Company fell off nearly $620,000 as compared with the same period of the previous year. For the year ending Dec. 31, 1916, the receipts show a gross gain of about $72,000 as compared with the 1915 period, but are still far short of 1914. This sum of approximately $1,270,000 represents the extent to which the company's receipts have suffered through jitney competition.

"In any discussion of street railway finances, and looking at the matter from every angle, the financial status of a city's transportation system cannot be otherwise than of interest to all residents of the city, neither can we overlook the fact that the high cost of materials in living expenses are just as great in this quarter as they are in the home of the most humble citizen. In fact, it has come to a point where it is not so much a question of jitney competition with the street railway company, not so much a question of whether or not the percentage of the gross receipts shall be paid to the city treasury, and whether or not the company shall pay its right of way and fulfill other franchise obligations. All these questions become secondary in the face of the problem of meeting the enormous increase in the cost of all necessary materials. Lumber, steel, copper, wages, everything, have all tended upward at an appalling rate, and the end is not in sight, while the price of a street car ride remains the same. And so it is fair to conclude that the jitney bus has been only one of a number of elements, the advent of which has proved to be very calamitous to the holder of traction securities."

Railway Abandons Jitney Service

Everett Company Decides Against the Auto After Trial Service

The Everett Railway, Light & Power Company, a subsidiary of the Puget Sound Traction, Light & Power Company, Seattle, Wash., has terminated its jitney service in Everett. The order was issued by D. C. Barnes, general manager of the company. He said:

"We have decided to withdraw our jitneys, for the time being at least, because our experience has clearly demonstrated that it is not an economically successful means of transportation.

"In our eighteen-months' operation, the cost of auto transportation has been 2 cents a seat mile, as compared with a cost of ¾ of a cent for street car service. Even by picking the cream of the business, the revenue of the jitneys in every month of their operation has fallen considerably below the expense of operation with a suitable allowance for depreciation. We are convinced that the jitney cannot survive the time which must eventually come when it will be required to give service equivalent to the street car, grant free transfer, and contribute to paving maintenance. The jitney has shown that the public wants frequent service and the new light weight cars which are operating on Hewitt Avenue are the answer."

Ten Ford machines were included in the equipment of the company, but the number of cars in service fluctuated with the volume of traffic during various hours of the day.

Non-Advertising Safety Posters

Kansas City Railways Enlist Co-operation of Drivers and Chauffeurs in Observing Safety Suggestions

As one phase of the safety work of the Kansas City (Mo.) Railways a group of safety suggestions was prepared, directed especially to teamsters and chauffeurs. Large cards, 16 in. x 24 in., have been printed, and posted in garages, barns, and similar places. Superintendents of barns and owners of garages have taken pains to direct the attention of drivers to the bulletins, with substantially good results in the reduction of collisions with street cars.

The bulletins do not mention the name of the Kansas City Railway Company. They read as follows:

A FEW SAFETY SUGGESTIONS

There are many accidents between street cars and vehicles of all kinds. Delays are caused and property is wasted.

Many accidents can and should be avoided.

Motormen are human and work for a living just as you do and you should show them every consideration that you would ask them to show you.

Cars are seldom broken, wagons and automobiles often are.

Cars do not have pain, drivers and horses do.

ACT AS YOU WOULD WANT THE DRIVER TO ACT IF YOU WERE A MOTORMAN.

The following rules should be rigidly adhered to:

Rule No. 1. When approaching a car track from a side street slow down so that you can stop on short notice. Cars are heavy and cannot stop as quickly as automobiles and other vehicles.

Rule No. 2. When driving on streets where there are car tracks drive between curb and track whenever possible.

Rule No. 3. Do not pull on to track to pass vehicle ahead of you until after you have looked back to see if car is approaching.

Rule No. 4. When passing car ahead do not pull to the left on to opposite track. Car may be approaching.

Rule No. 5. When passing a standing car have your vehicle under control. A passenger may suddenly appear from behind car.

Fare Increases Protested

Protests have been filed with the Public Service Commission for the Second District of New York against the contemplated fare increases on the lines of the Schenectady Railway and the Fonda, Johnstown & Gloversville Railroad. Mayor George R. Lunn, of Schenectady, is leading the opposition to the proposed increases. He is backed, however, by practically all the Chamber of Commerce committees as well as the civic organizations of the cities and towns along the lines affected.

The Schenectady Railway proposed to increase its fare by 5 cents between Troy and Schenectady by increasing the number of fare zones between the two cities from four to five, and increasing the fare from 30 to 35 cents between Schenectady and Saratoga Springs by the addition of another fare zone.

New specific tariffs were filed for each station on the Fonda, Johnstown & Gloversville Railroad. Generally speaking this would practically mean graded increases between the cities of Gloversville and Schenectady and Schenectady, Troy and Saratoga as well as intermediate points.

The only variance from the above mentioned protest was the point raised by the representatives of the city of Watervliet, in that they claimed that the franchise granted to the Schenectady Railway limited it to its present fare rates between Watervliet and Schenectady, and that any deviation therefrom affected the franchise.

The commission on its own motion agreed to enter into an investigation as to the reasonableness of the rates proposed, and on Jan. 25, 1917, issued an order suspending the proposed fare increase until April 15 or until a later date if a further suspension would be necessary. No date has as yet been set for a hearing in the matter.

Atlanta Has Company Publication

It Is Built on the Form of a Daily Paper—No Advertising Accepted

Here We Are is the title of a monthly whose publication has just been begun. It is issued for distribution among employees, officers and owners of Georgia Railway & Power Company, Georgia Railway & Electric Company, Atlanta Gas Light Company, Atlanta Northern Railways, all of Atlanta, Ga., the Suburban Gas & Electric Company, Decatur, Ga., and the Carrollton (Ga.) Electric Company. In make-up it differs radically from nearly all other company publications, the page size being 19 in. x 12½ in. This admits of five 2¼-in. columns. There are four pages in the first issue, which is dated Feb. 1, 1917.

The material is patterned also on the daily newspaper and consists of short articles with crisp heads. The material relates not only to the internal news of the company, but to its new construction plans. A special notice says that no advertising will be accepted.

Advertisements Removed from Outside Cars.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., has ordered all advertisements removed from the outside of its cars. The Trenton City Commission recently adopted an ordinance prohibiting advertisements being displayed on vehicles and by "sandwich" men.

Columbus Civic Bodies Plan Re-routing.—Representatives of twenty-seven civic organizations in the city of Columbus, Ohio, have undertaken to formulate a plan of re-routing and they declared at a meeting on Jan. 31, that it is their intention to follow Mayor Karb's suggestion to map out a plan that will be of the greatest benefit to the majority of the people of the city.

Grade-Crossing Accident in Joplin.—Eight men were badly hurt when a work car on the Southwest Missouri Railroad, Webb City, Mo., was struck by a Frisco passenger engine on East Fourth Street in Joplin at 1.15 p. m. on Jan. 23. The work car was demolished and the engine was overturned. All the injured were members of the interurban line's work crew.

Texas Parlor Car Service in April.—The Texas Electric Railway, a consolidation of the Texas Traction Company and Southern Traction Company, expects to begin the operation of the previously announced parlor-car service on its lines from Dennison to Waco and Corsicana on April 15. According to Burr Martin, general manager of the lines, an extra charge of 25 cents will be made for the parlor-car privilege.

Boston Elevated Creates New Department.—The Boston Elevated Railway has consolidated the department of surface lines and the department of traffic into a new department, to be known as the department of surface transportation. Edward Dana, at present superintendent of traffic, has been appointed manager of surface transportation and has been given charge of the new consolidated department and will hereafter be responsible for the operation of all surface line service. C. R. Tripp, at present superintendent of surface lines, is appointed supervisor of surface lines, reporting to the manager of surface transportation.

Memphis Company Celebrates Accident Reduction.—According to figures given out by E. W. Ford, general superintendent of the Memphis (Tenn.) Street Railway at a "Safety First" banquet on Jan. 16, in 1912 the company recorded 3496 accidents, while in 1913, when the safety committees were organized, there were 2514 accidents. The reduction has followed each year until 1916 showed only 1726, a decrease of 50 per cent. A comparison of the number of controversies, under which head appears "fighting and ejectments," showed that in 1912 238 persons were ejected for fighting, while last year only 127 were listed under this head. There were only 685 collisions with vehicles last year as against 1401 in 1912; 1008 in 1913; 586 in 1914, and 652 in 1915.

Commissioner Woods Urges Traffic Changes.—The wisdom of appointing a traffic commission to work out and recommend a plan for handling traffic in New York City in view of the increasing difficulty and dangers of the traffic problem has been urged by Arthur Woods, Police Commissioner, in a letter to Mayor Mitchel. Among other matters to be considered by such a commission, the letter suggests opening up various arteries of travel by removing pillars of elevated lines and placing them on the sidewalk at the curb lines, and by reducing the width of sidewalks along certain sections of Madison and Lexington Avenues and along Central Park West. The letter also suggests working out arrangements whereby certain classes of vehicles could be kept off crowded streets at busy hours, and whereby a considerable portion of the traffic could be done at night.

Full Service Established After Fire.—Full service has been established on the lines of the Eastern Pennsylvania Railways, Pottsville, Pa., after interruption by the fire of Jan. 6, which damaged the power station and repair shops at Palo Alto. For a few nights after the fire only partial railway service could be maintained, but the full lighting load was met. The failure of two converters due to fire damages caused a shortage of power and the management was further handicapped by the losses of buildings and other equipment. A portable substation was obtained from the Monongahela Valley Traction Company at Fairmont, W. Va. It arrived in Palo Alto at noon on Jan. 28, and was ready for operation early on the morning of Jan. 29. It was an important factor in helping to restore traffic. The normal number of cars has been operated now for some time and work of reconstruction is being carried out.

240,211,749 Passengers Carried in St. Louis in 1916.—According to the quarterly report filed on Jan. 15, with the City Register by the United Railways, 19,000,000 more passengers were carried during the year 1916 than during the year 1915. A total of 62,907,496 passengers was carried in the last three months of 1916. This is an increase of more than 3,700,000 over the preceding three months and is 5,200,000 more than in the corresponding three months in 1915. The 3,700,000 extra passengers in the last three months were transported with the use of an average of only five more cars on week days than in the preceding quarter and nine more cars on Saturdays. A total of 1267 week-day cars were used in the last three months and 1262 were used in the previous three months. In 1916 a total of 240,211,749 passengers was carried, as against 221,039,858 in 1915. The cars made 6,495,454 trips in 1916 and 6,147,822 trips in the preceding year.

New York Railways Depicts Congestion Crisis. — In line with the recently adopted plan of the Interborough Rapid Transit Company, New York, to issue for public perusal bulletins from time to time as special problems arise, the New York Railways is now represented in a similar manner by the publication of a new illustrated bulletin, entitled *New York Railway Service*. The first issue, dated Jan. 29, is devoted entirely to the crisis in street congestion in New York City, which is characterized by serious blockades from building operations, subway construction, sewer and water main excavation and repaving, by a grave shortage in the Street Cleaning Department's snow fighting forces and by an enormous increase in the number of automobiles. As relief measures which would help the situation, the bulletin suggests that vehicles be not allowed to stand along the curb of certain designated streets, that traffic officers co-operate closer at certain localities in regulating traffic, and that certain crosstown streets be limited to one-way traffic during rush hours.

Personal Mention

W. B. Savage has been appointed claim agent of the Tidewater Power Company, Wilmington, N. C.

J. J. Kilkenny has been elected vice-president of the Sacramento Valley Electric Railroad, Dixon, Cal.

J. H. Robertson, superintendent of the Salisbury & Spencer Railway, Salisbury, N. C., has been appointed local manager of this company, succeeding R. J. Hole.

K. D. Leavitt, master mechanic of the Public Utilities Company, Evansville, Ind., has resigned to become master mechanic of the Northern Ohio Traction & Light Company, Akron, Ohio.

William Hardecker, who has been connected with the Pottstown (Pa.) branch of the Reading Transit & Light Company, has become superintendent of the street railway facilities in Lebanon.

G. Harold Smith, assistant engineer of the Rockford and Interurban Railway, Rockford, Ill., has been appointed acting chief engineer of the company, until a successor to Ward S. Hubbard is selected.

Edward Dana, superintendent of traffic of the Boston (Mass.) Elevated Railway, has been appointed manager of surface transportation in charge of the new consolidated department, which includes the department of surface lines and the department of traffic.

R. B. Stichter, vice-president of the Texas Traction Company and the Southern Traction Company, Dallas, Tex., while crossing a street in Dallas on Jan. 24, was run over by an automobile, and seriously injured. According to a local newspaper report, he will probably recover.

G. R. Tripp, superintendent of surface lines of the Boston (Mass.) Elevated Railway, has been appointed supervisor of surface lines, reporting to the manager of surface transportation in the new consolidated department which includes the department of surface lines and the department of traffic.

R. H. Sperling, formerly general manager of the British Columbia Electric Railway, Vancouver, B. C., and latterly assistant chairman and a director in London, England, has resigned those positions on taking a commission in the British army, and has been appointed one of the advisers to the directors.

A. E. Ward, who in the past has been located in Reading, Pa., with the Reading Transit & Light Company, has been transferred by that company to Lebanon and appointed general manager of the Lebanon division, with full authority in the operation of the electric and street railway service there.

W. S. Murray has been appointed assistant to the president of the Housatonic Power Company, effective on Jan. 1, 1917. This is one of the subsidiaries of the New York, New Haven & Hartford Railroad and the work includes caring for the engineering, operation and construction of the power system. The Housatonic Power Company develops and transmits high-voltage electricity in the western and middle sections of Connecticut, using steam and hydroelectric stations, and among its principal customers are the Connecticut Company and the United Electric Light & Water Company. Owing to its growing business it has many interesting power and transmission problems, a recent one being the supply of power to meet the growing demand of the United Electric Light & Water Company at New Britain. To meet this demand the Housatonic Power Company has ordered the necessary electrical apparatus in the form of step-up and step-down transformers, frequency changes and switchgear to transmit 6000 kw. to a frequency change station at New Britain. The transmission potential will be 33,000 volts, with duplicate three-phase circuits. The wires will be No. 00 copper, supported on steel towers and the distance is approximately 38 miles. Mr. Murray's work in connection with the Housatonic Power Company will in no way affect his relations with the firm of McHenry & Murray, with which he remains a partner.

G. Gordon Gale, general manager and chief engineer of the Hull (Que.) Electric Company, has been appointed vice-president and general manager, succeeding E. W. Beatty, who, however, remains as a director. Mr. Gale will continue to attend to the engineering work. He was graduated from McGill University and prior to 1907 was assistant engineer of the Canadian Rubber Company's electrical plant. From 1907 to November, 1908, he was superintendent of power of the Hull Electric Company and from November, 1908, to 1909, was acting superintendent of the company. From 1909 to June, 1914, Mr. Gale was general superintendent of the company. In 1914 he was appointed manager. Mr. Gale is an associate member of the Institute of Electrical Engineers and the Canadian Society of Civil Engineers.

G. GORDON GALE

Clarence W. Huntington has been elected president of the Richmond Light & Railroad Company, succeeding the late Charles W. Hotchkiss, and also chairman of the board of the Virginian Railway, with headquarters at New York. Mr. Huntington was born in 1857, at Newark, N. J., and was educated in the public schools, the Newark Academy, and Dorchester High School, Boston. He began railway work in 1876, as a freight brakeman on the Chicago, Rock Island & Pacific Railroad, and for sixteen years held various positions on the same road. He was then for one year assistant superintendent of the Des Moines Northern & Western Railroad and later for one year was superintendent of the same road. From 1894 to 1902 he was general superintendent of the Iowa Central Railroad, and then went to the Central Railroad of New Jersey as general superintendent, with headquarters at New York. In February, 1914, he was elected vice-president and general manager of the Minneapolis & St. Louis Railroad, with headquarters at Minneapolis, Minn., from which office he resigned to accept his present position.

E. A. Maher, Sr., whose election as president of the Third Avenue Railway System, New York, was announced in last week's issue, has become by the assumption of his new position the head of a property aggregating about 370 miles of single track, including subsidiary companies, connecting Manhattan with the Bronx and extending out into the suburban towns of Mt. Vernon, New Rochelle, Bronxville, Larchmont, Tuckahoe, Pelham, Yonkers and Hastings. Mr. Maher, owing to the broad executive training and practical experience in dealing with the public which he gained from his earlier positions as president of the Board of Supervisors of Albany, as a member of the Assembly from that city and later as Mayor of Albany for two years, is eminently well qualified for the exacting demands of his new office. This broad training has been supplemented by an expert knowledge both of public utility operation and of the special problems attending the system with which he is connected, based on twenty-five years of street railway work, including sixteen years as president of the Union Railway and nine years as general manager and later vice-president of the Third Avenue Railway.

E. A. MAHER

Obituary

Charles T. Schoen, one of the foremost figures in the development of the steel car industry of the country, died on Feb. 5, at his home, at Rose Valley, Moylan, Pa. He was seventy-two years old. Mr. Schoen was born in Delaware and was educated in Wilmington. He worked there with his father, Henry Casper Schoen, in whose shops he learned the cooper's trade. About 1864 he removed to Philadelphia to assume a position with Charles Scott, who was engaged in the manufacture of car springs. Mr. Schoen later developed pressed steel equipment and fittings for wooden freight cars, including car trucks, and finally the complete steel car. The first company to manufacture the steel cars was known as the Schoen Pressed Steel Car Company, and its extensive plant was established in 1889 at Schoenville, near Pittsburgh. Out of this company afterwards grew the reorganized Pressed Steel Car Company. His connection with this industry ceased in 1902. He also produced a solid forged and rolled steel wheel. A plant was established adjoining his former car plant at Schoenville and also in Leeds, England, which now is being used to produce munitions. In 1907 Mr. Schoen sold his plant at Schoenville and his patents to the United States Steel Corporation, and returned to his estate. He is survived by his widow and three daughters.

George Henry Hill, assistant engineer railway and traction department General Electric Company, died at his home in Schenectady on Jan. 31, 1917, after a short illness from pneumonia. At the time of his death he was less than forty-five years of age. This unfortunate event deprives the General Electric Company of one of its most useful and highly-appreciated engineers, and the profession of electrical engineering of a vigorous and well-balanced analyst of its problems, particularly those relating to control of electrical apparatus and heavy electric traction. His reputation for fairness and square dealing, also, invariably won for him an unswerving loyalty among his associates in business and in private life.

Mr. Hill's career shows what can be done by concentration of purpose and ingenuity in overcoming practical and theoretical difficulties. His work was consistent in plan and purpose from the time of his completion of the electrical engineering course at the Johns Hopkins University, Baltimore, Md., in 1895, until his death nearly twenty-two years later. Immediately after graduation he joined the staff of Frank J. Sprague, who at that time was engaged in the development of electrically-operated elevators and multiple unit control for railway service. He soon became chief of construction of the elevator department of the Sprague Electric Company and, when this company gave up its elevator business in 1900, he became chief engineer of the company with headquarters at Bloomfield, N. J. Here with Mr. Sprague he devoted his attention to development of multiple-unit control for railway trains.

In 1902 the General Electric Company took over the Sprague patents and interests, and Mr. Hill went to Schenectady to assist in the further development of train control. He became assistant to F. E. Case and was actively connected with the manufacture of car equipment for the Manhattan Elevated Railroad in New York, the Boston Elevated Railway, the Interborough Rapid Transit Company, the Northwestern Elevated Railroad, the Philadelphia Rapid Transit Company and others. He did work also in connection with the Baltimore & Ohio, New York Central and other electric locomotives. After four years in this work he became assistant engineer of the railway and traction department where he has since aided in the solution of many difficult problems. Articles from his pen on railway subjects have frequently appeared in the technical press and in the proceedings of the A. I. E. E. Two years ago he served a term effectively as chairman of the local section of this association. During the course of his studies he made many useful inventions in the railway and other electrical fields and was granted nearly fifty patents. The editors of the ELECTRIC RAILWAY JOURNAL have been assisted in their work on many occasions by Mr. Hill, and at the time of his death he had in preparation for this paper an article on an important electric railway subject.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Duquoin, Christopher & Eastern Traction Company, Duquoin, Ill.**—Incorporated to construct a line out of Duquoin through the towns of North City, Christopher, Buckner, Orient and West Frankfort to Elkville, Hallidayboro, De Soto and Carbondale. Capital stock, $6,000.

***Ocean City & Fenwick Island Railway, Ocean City, Md.**—Incorporated to construct an electric railway 8 miles up the beach in Ocean City to Fenwick Island. The construction contract has been let to Thomas E. O'Connell of Phoenixville, Pa. The company is in the market for about 10 miles of relaying rails weighing from 60 to 70 lb. per yard; also for necessary materials for overhead work and four trolley cars of the open type, with running boards. Officers: W. B. S. Powell, president; C. Edward Shute, secretary; Harry J. Cropper, vice-president, and Frank W. Truitt, treasurer, all of Ocean City.

FRANCHISES

Fullerton, Cal.—An ordinance providing for a franchise for the Pacific Electric Railway through Fullerton on the route to Anaheim has been adopted by the City Council of Fullerton. The franchise is indeterminate as to the number of years that the line may be maintained, providing that it can be taken over by the city of Fullerton at any time after five years by condemnation. Work on the Pacific Electric line to Anaheim has been begun and it is expected that the line will be completed in four months.

Waterbury, Conn.—The Public Utilities Commission of Connecticut has approved the plans of the Connecticut Company for the construction of double tracks on West Main Street and private right-of-way in Waterbury..

Chicago, Ill.—The City Council of Chicago has referred to the transportation committee an ordinance for the extension of the 103d Street line of the Chicago City Railways from Cottage Grove Avenue east to Torrence Avenue.

Fort Wayne, Ind.—The Fort Wayne & Northern Indiana Traction Company has asked the City Council for a franchise to construct an extension of its Pontiac Street line.

Baltimore, Md.—The Board of Estimate has approved the ordinance authorizing the United Railways & Electric Company to lay switches and turnouts in the construction of the new Liberty Heights Avenue car line, which is being constructed as a more direct route from Garrison Avenue to the center of the city.

Tonawanda, N. Y.—The International Railway has received a franchise from the City Council to construct an extension of its Grand Island Ferry line along the River Road to the Wickwire Steel Company's property in Tonawanda. The proposed line will be 7700 ft. long.

TRACK AND ROADWAY

Fort Smith Light & Traction Company, Fort Smith, Ark.—This company has concluded a contract with the Arkansas Zinc & Smelting Company of Van Buren to extend its Van Buren line to the smelter. The extension will be 1 mile long and will cost about $20,000. Work on the new extension will begin at once and will be pushed through to completion as fast as material and labor can be had.

Pacific Electric Railway, Los Angeles, Cal.—R. Sherer Company, Los Angeles, has received a contract from the Pacific Electric Railway for grading the roadbed and building bridges and culverts on its proposed line from La Habra to Fullerton. The cost will be about $54,000.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—It is reported that the Oakland, Antioch & Eastern Railway plans to construct an extension from Pittsburg to Antioch within the next few months.

San Diego & South Eastern Railway, San Diego, Cal.—The Utah Construction Company, Ogden, has received a contract from the San Diego & South Eastern Railway to construct about 20 miles of railway.

Municipal Railways of San Francisco, San Francisco, Cal.—A municipal railway line up Market Street from the Ferry through the Twin Peaks Tunnel to Sloat Boulevard, and the connection of the completed Church Street line with it, has been authorized by the Public Utilities Committee of the Board of Supervisors. It will entail altogether an expenditure of $655,000, as follows: Kearny and Market Streets to Van Ness Avenue and Market Street, $250,000; Van Ness Avenue and Market Street to Church and Sixteenth Streets, $110,000; Church and Market Streets to the mouth of Twin Peaks Tunnel, $82,000; through the Twin Peaks Tunnel to Sloat Boulevard, $213,000. The construction of the lines was authorized under the recent decision of Federal Judge Hunt, which gives the city the right to parallel the tracks of the United Railroads. City Engineer M. M. O'Shaughnessy was directed to order the rails for the construction of outer tracks on Market Street from Kearny Street to Van Ness Avenue, and from Church Street to the tunnel mouth. These rails will cost $37,605. By taking advantage of the option it had to order additional rails. The city now will begin to get deliveries by June 29. The entire projected lines will be completed and cars operating over them by Nov. 1. The Church Street-Van Ness Avenue line will be in operation by July 1. In addition to authorizing the city engineer to order the additional rails, the Public Utilities Committee recommended that the Board of Works be authorized to call for bids for the construction of the different lines.

Meriden, Middletown & Guilford Railway, Meriden, Conn.—Francis Atwater, New Haven, has been appointed receiver for the Meriden, Middletown & Guilford Railway. The railway was incorporated in 1907 to construct a line between East Meriden and Guilford, but little work has been done on the line.

Peoria (Ill.) Railway.—This company will double-track its Adams Street line from Western Avenue to Nevada Street, Peoria.

Chicago, South Bend & Northern Indiana Traction Company, South Bend, Ind.—A contract has been awarded to the Pennsylvania Steel Company, Pittsburgh, Pa., for new 125-lb. steel rails for the north side line of the Chicago, South Bend & Northern Indiana Traction Company between South Bend and Mishawaka. The cost of the new rails, new section work and new paving will be about $155,662.

Manhattan City & Interurban Railway, Manhattan, Kan.—A bond issue of $200,000 has been voted by the stockholders of the Manhattan City & Interurban Railway to pay indebtedness and to make extensive improvements.

Mankato (Minn.) Electric Traction Company.—A contract has been entered into between the Mankato Electric Traction Company and the city of Mankato whereby the company will pay $5,000 to the city toward the construction of a bridge to North Mankato and an additional $300 toward defraying the expenses of constructing cables and trolleys across the structure.

St. Paul (Minn.) City Railway.—This company plans to construct extensions of its East Seventh Street and St. Clair Street lines.

***Freehold, N. J.**—Plans are being revived to construct an electric railway between Freehold and Asbury Park and the Civic Development Company of Farmingdale has been incorporated with a capital of $50,000 to advance the project. More than $100,000 has been subscribed toward the proposition and $25,000 actual cash has been paid in. The incorporators of the Civic Development Company are: William J. Lansley, Farmingdale; Clarence Hodson, Newark, and L. C. Tompkins, Morristown.

***Binghamton, N. Y.**—Plans are being revived for the construction of a line from Binghamton to Utica. Franchises granted in 1907 have been renewed. The plan includes the construction of a large power house at Whitney's Point. Thomas McBride, Clinton, is interested.

Brooklyn (N. Y.) Rapid Transit Company.—Operation of the Jamaica Avenue elevated line of the Brooklyn Rapid Transit Company from Cypress Hills to Spruce Street, Richmond Hill, will be begun on April 1, and of the whole line to Grant Avenue, Jamaica, by Sept. 1. The line is 4½ miles long and will be operated in conjunction with the Broadway elevated line in Brooklyn and will connect with the express service over that division.

Panama Traction Company, Jamestown, N. Y.—Grading is now under way by this company between Sugargrove, Pa., and Busti, N. Y., and between Busti and Ashville, N. Y. It is expected that the line from Youngsville to Panama will be completed and in operation by next Fall. The engineers of the company are Graham & Chapman, Jamestown, N. Y. D. L. Davis, Jamestown, general manager. [Jan. 20, '17.]

Interborough Rapid Transit Company, New York, N. Y.—The new Astoria elevated extension connecting with the Queensboro subway was placed in operation by the Interborough Rapid Transit Company on Feb. 1. Plans have been made by the Public Service Commission for the First District of New York for the construction of an extension of the Eastern Parkway subway on Utica Avenue. The extension will be a three-track elevated line from Eastern Parkway to Flatbush Avenue. The cost is estimated at $5,210,536.

Manhattan & Queens Traction Corporation, New York, N. Y.—The Board of Public Works has ordered the Manhattan & Queens Traction Company to begin construction of an extension of its railway from Lambertville Avenue and Sutphin Road through to Springfield Avenue, Hollis.

Cleveland, Akron & Canton Terminal Railway, Cleveland, Ohio.—J. J. Breitinger, a director of this company, is authority for the statement that work will be started on the proposed freight subway under East Fifty-fifth Street, Cleveland, on April 1. A contract, amounting to $12,000,000 has been awarded to the Foundation Company, New York, and it is expected that the road will be in operation within two years. He said further that an amendment to the franchise would be asked of the City Council, allowing the company to change its route somewhat. [Dec. 9, '16.]

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.—This company contemplates the construction of an extension from Seville to Wadsworth.

Youngstown & Niles Railway, Youngstown, Ohio.—Construction will be begun next spring by the Youngstown & Niles Railway on its proposed line to Niles. The new company is a subsidiary of the Mahoning & Shenango Railway & Light Company. The line will begin at the end of the Steel Street line and will continue westward on the south side of the river, passing through the new town of MacDonald and entering Niles at the south end of the Main Street bridge. A mortgage has been filed at the courthouse by the company to the Guaranty Trust Company, New York, as trustee to secure an issue of $10,000,000 of bonds to provide funds to cover the cost of building the road and care for future financial needs. J. P. Wilson, Youngstown, president. [Aug. 26, '16.]

Toronto, Ont.—Small towns along the Canadian-Niagara frontier have received a communication from the Ontario Hydro-Electric Association protesting the granting of permission to the Toronto, Hamilton & Buffalo Railway, to extend its line to Port Colborne. The steam line has asked for a franchise to construct a steam or electric line along the Canadian-Niagara frontier which would be in competition with the hydroelectric line which was approved at the special election in January.

Dover-Rossville Transit Company, Dover, Pa.—Construction work has been completed by the Dover-Rossville Transit Company on its trackless trolley line between Dover and Rossville, and operation will be begun soon. [Jan. 20. '17.]

Philadelphia, Pa.—Plans for the Darby elevated line, Philadelphia, have been completed and forwarded to the Public Service Commission of Pennsylvania, with an application for a certificate of convenience to authorize construction. This completed the plans for all the lines of the comprehensive system as specified in the transit ordinance approved by the Philadelphia Council in 1916. The parkway, subway and elevated plans were filed by the Transit Department when a hearing was held before the Public Service Commission several weeks ago. The ordinance authorizing the construction of the system provides also for the building of the necessary spurs northeast and northwest from the Broad Street subway, but the lines are not definitely fixed nor the routes determined. The council will have to approve the routes and authorize their construction.

Marlin-Temple Interurban Company, Marlin, Tex.—S. D. Hanna, chief engineer of the Marlin-Temple Interurban Company, has filed a report showing preliminary estimates of cost of construction, which is placed at $450,000. The engineer's report is based on a 1 per cent grade. The proposed line is 33 miles long, and will pass through Temple, Belfalls, Durango, The Falls and Marlin. It will cross the Brazos River on a bridge to cost $53,500. Work will be begun on the laying of rails immediately. [Jan. 20, '17.]

SHOPS AND BUILDINGS

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me.—This company contemplates the construction of large additions to its present carhouse and a new paint shop in Lewiston. The building will be one story high, of brick construction, and will cost about $18,000.

Twin City Rapid Transit Company, Minneapolis, Minn.—A new $90,000 carhouse will be built by the Twin City Rapid Transit Company at St. Paul. The new station will take care of 100 street cars, thirty-six in the carhouse and the remainder on outside storage tracks, and will include trainmen's club rooms and offices for foremen and clerks.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—This company will erect a new passenger station at Princeton.

POWER HOUSES AND SUBSTATIONS

Commonwealth Power, Railway & Light Company, Grand Rapids, Mich.—This company, through its subsidiary, the Consumers' Power Company of Maine, is constructing on the Manistee and Ausable Rivers two new additions to its power system in Michigan. At the Manistee Junction dam 23,000 hp. will be in operation by next December and on the Ausable two plants of 12,000 hp. each will be ready by June, 1918. Already the company has four plants on the river, with a total combined capacity of 60,000 hp. The demand for power in this section has increased 35 per cent during the past year.

International Railway, Buffalo, N. Y.—The International Railway will construct a new substation in Niagara Falls, N. Y. A site has been acquired at Allen Avenue and Twenty-fourth Street, and plans have been made for the erection of a brick and steel building to cost $31,000. Transformers and other electric equipment will cost approximately $150,000. The new station will not only supply the Niagara Falls local lines but will supply part of the power for the new Buffalo-Niagara Falls lines. The company has placed an order with the General Electric Company, Schenectady, for a 1000-kw. generator. Pending the completion of the new substation, the generator will be temporarily installed in the plant of the Niagara Falls Power Company. This will tend to relieve the shortage of power now being experienced by the company in the operation of its Niagara Falls local lines.

Richmond Light & Railroad Company, New Brighton, N. Y.—It is reported that the Richmond Light & Railroad Company plans to construct a new 6000-volt transmission circuit on both sides of Staten Island to afford improved lighting service to the different municipalities.

Northern Ohio Traction & Light Company, Akron, Ohio.—A 7500-kw. generating unit has been installed by the Northern Ohio Traction & Light Company in its substation at Akron, to be used until two new 20,000-kw. units have been installed. The first of these units has been delivered and will be in use in April. It is expected to have the second unit in operation in June. About 4000 hp. additional boiler capacity will be installed in the latter part of the year. The transmission and distributing lines of the company in the Canton-Akron district are to be extended materially this year.

Manufactures and Markets

Discussions of Industrial Conditions
A Department for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Business Announcements Trade Literature

Observations on Car Motor and Control Purchasing

Suggestions Made by an Engineer Who Urges Closer Co-operation in Purchasing and Greater Exactness in Specifying

Last year the electric railways of the United States and Canada ordered 3942 new cars. These orders were placed by 250 roads, and 3420 of the cars were for passenger service. Fully 3200 of these cars required motor equipment, so that it may definitely be stated that for the year 1916 the average motor order per week day was for about thirteen cars. Many motors of course also were ordered for replacements.

Types and capacities of motors vary so widely that it would be difficult to approximate the sale value of the average car order. However, the duty which the motor car has to perform and the original and up-keep cost of the electrical equipment are sufficiently great in value to warrant the statement, based on experience, that electric railways could profitably afford to devote more engineering attention to motor buying. The thoughts here set down are based on a desire to bring about closer and more profitable co-operation between the buyer and seller of motor car electrical equipment.

Study Operating Conditions

Manufacturers of motor equipment invariably welcome an opportunity to help in the study of operating conditions. This will lead to the choice of the correct motor for the actual service desired. Any approximation of service conditions introduces estimations rather than definite calculations and thus may involve the correctness of the final choice. Descriptions of service conditions when given to a motor manufacturer may be accurately recited so far as they go, but in general it is safe to say that a more detailed analysis would bring out more accurate results. For example: Exactness in statements of the miles of operation in city, suburban and interurban territory are not always clearly set forth. Variation in these classes of service will sometimes show that the real conditions to be met are less severe or more severe than the average would have indicated, and therefore might involve inaccuracy in the recommendations made the manufacturer. It is not unknown for a manufacturer of motors to be confronted with conditions of service desired in which the total standing time is equivalent to the total running time. A statement of how the working and idle hours of a motor are to be distributed throughout the day will mean much in the consideration of the internal heating problem.

It is reported on reliable authority in connection with service conditions of a locomotive that where the question was asked, "How many hours a day would it be in operation?" the reply was to the effect that "It would not operate during the day, but merely at night."

In the setting down of the working conditions to be met by new motors, careful attention should be given to such items as stops per mile and their duration. Special inspection of the service with a stopwatch in hand may be necessary to bring existing data on stops down to date. All too frequently the statement of the average voltage over the line is the result of observation of the brilliancy of the lamps in the car rather than actual volt meter readings. The proper way to obtain the average voltage is to take ten-second voltmeter readings on the car during light-load and heavy-load period round trips.

The weight recited in connection with either an old or a new car is too often in guess work, and a variation of even more than a ton does not seem to call for careful weight-checking even though the weight to be moved is a most important factor in the choice and design of motor equipment.

It is often indicated by the buyer that such and such a motor is successfully performing service similar to the one under consideration, and therefore the buyer calls for "The same size motor." On inquiry it may be found that no real observations were taken to determine whether the service to be performed was or was not similar to that on which the old motors were supposed to be doing so well. Success is merely a relative term. A given company may be accustomed to certain conditions of failure which on another property would not be tolerated. This is one more reason for furnishing the motor manufacturer with complete data rather than permitting the choice of equipment to be based on the experience of any one man or group of men.

Make Specifications Definite

Definiteness in specifications for motor equipment is far more essential than for most any other class of material purchased by electric railways. Specifications requesting bids very often indicate conditions of service to be met, yet the full descriptions of service may be found to be incomplete. Time will not always permit the motor manufacturer to make detailed investigations for the purpose of verification. In such instances the bidder may find himself unable to make the best possible offering. Hence, the purchaser may not have the advantage of fully competitive bidding. Alternative propositions which may be submitted on the basis of assumed changes in requirements breed uncertainty.

For the reasons here set forth, an electric railway which contemplates the purchase of motors either for new cars or for replacing antiquated equipment is certainly warranted in analyzing its conditions in a most exhaustive way before requesting bids.

Specifying Axle Sizes and Gears

Now as to some of the details. Car wheels are practically standard and change mainly as to diameter, but motor gearing is built especially to suit the service conditions of a given road. Yet the choice of motor gearing too often is only considered, analyzed and determined upon after all of the rest of the equipment has been ordered. It should be remembered that if solid gears are to be used, which is the standard practice of the present day and logically so, the gears will be needed by the manufacturer almost as soon as the motor order is placed.

And while on the subject of gears, it might be well to point out that the allowance for press fits of the gear on the axle has been fixed by practice. The standard established is 0.001 in. allowance per inch of diameter of the bore of the gear, with a manufacturing tolerance of plus 0.0015 in. to minus 0.001 in. This factor is known, but in placing the order for the axles the diameter is not always indicated with due regard to manufacturing tolerance in finishing, and it will readily be seen that proper allowance for finishing in a given case may be wiped out by lack of consideration of this factor.

Forehandedness in ordering motor equipment also may bring about considerable relief to the manufacturer when fulfilling delivery requirements. The railway motor consists of approximately 175 different parts, made from about twenty-five different kinds of materials. Copper has always been and probably will remain for some time the most difficult portion of the motor to obtain. It is much easier to secure the ordinary commercial steel and wood entering into the construction of the car body than the cable, wire and copper parts needed in the construction of the car body, yet the amount, size and type are determined only too often at the very last moment—thus creating rush and confusion and possible delay in delivery.

Full standardization of equipment is something worth working for. If the day ever comes when the design of motors can be restricted to ten sizes or less for ordinary city and interurban work, then the railways properly may demand a more finished product, which the manufacturers in turn will be able to deliver at less cost. Now-a-days it frequently happens that changes from a manufacturer's standards are requested apparently in order only to meet the notion of the buyer. Standards adopted by the manufacturers are the result of years of experience and exemplify the recorded wish of operating engineers throughout the country. Therefore, one who is specifying motors must be sure of his ground before setting his requirements against this array of experience and talent.

To summarize: The main things to be remembered are forehandedness in ordering, adherence to established standards where possible, and a thorough study of operating conditions crystallized into a definite set of specifications.

Relieving the Car Shortage

Business Men Urged to Work for Central Traffic Regulator—Railroads Need Reserve for Abnormal Times

In a recent answer to queries propounded by the American Druggists' Syndicate, A. H. Smith, president New York Central Lines, explained the causes of car shortage in this country and the means for its relief. In his opinion, the present congestion has been brought about entirely by an unprecedented and abnormal industrial situation, created somewhat by the catastrophe abroad. In addition to the enormous foreign traffic moving to and from tidewater, there has been set up a greater internal industrial situation in manufacture and commerce to provide these supplies. An unprecedented amount of ore, coal, coke, pig iron, billets, automobiles, motor trucks, munitions, food products and hospital supplies of all kinds are being handled, and in many cases half a dozen times. Within a few months the railroads were called upon to perform in many instances a service 40 per cent in excess of the preceding year. They had not the reserve for such a condition, and had been unable financially to anticipate it even if they would have been justified in so doing. Simultaneous with the demand for rail transportation, there occurred a demoralization of ocean shipping, owing to naval warfare and to the withdrawal of ships for other purposes. Traffic now has to be handled by embargoes in harmony with the ocean shipping, which naturally results in congestion in the interior.

The duration of the congestion, Mr. Smith says, is problematical. Unfortunately the very conditions which have produced the present prosperity have greatly increased the costs of material, including equipment, and the great shortage of labor not only retards construction work but embarrasses the daily operation of railroads. Notwithstanding the great cost of doing work at the present time, however, some large companies now have under contract and under construction hundreds of additional engines and thousands of additional cars which, as they arrive from time to time, will aid somewhat in facilitating the movement of traffic.

Mr. Smith believes that business men can render powerful aid, if not in overcoming the immediate situation, at least in preventing to some extent a recurrence of similar congestions. This aid must come through the creation of a healthy, honest, fair and intelligent public opinion towards railroads. Railroads must be permitted to build up a surplus and a reserve to meet the abnormal fluctuations in business. These fluctuations come suddenly and spontaneously, due to the abundance of crops and other natural conditions, which cannot be anticipated. As long as the railroads are required to exist on a miserly basis of the sparse year and the minimum traffic, it is useless to expect them to be ready for abnormal conditions and for the years of plenty.

The ultimate remedy seems to be that business syndicates, chambers of commerce, manufacturers' associations, traffic leagues and other various commercial and agricultural organizations must take up their own case by organizing in some way a national board of transportation, and undertake a campaign of education which will ultimately show the wisdom of creating a central authority to co-ordinate the work of federal and state commissions and regulate traffic. Before such a tribunal the board of transportation and the really ought to be done in the way of rates and improve-railroad interests could always meet and determine what ments, and the means of raising the money therefor.

Long-Period Deliveries for Raw Materials Continue

No general change in the raw materials delivery situation is apparent, except perhaps a psychological one on the part of buyers. In some few cases an improvement has already been noted. As a rule, however, deliveries of raw materials are just as long as they were in the fall of 1916, and in many cases longer. Brass manufacturers, steel manufacturers, foundries, etc., have sufficient orders on their books to take care of capacity production for many months, and will therefore be unable to materially better deliveries for some time. The shortage of freight cars for the past three months has been another very disturbing factor in this connection. Some roads have been forced to place embargoes on heavy freight, thereby adding a further delay in shipment.

In view, however, of the chaotic state of deliveries of twelve months ago, it can almost be said that at the present time deliveries are in an excellent state. As buyers formerly had been accustomed to receiving delivery in at least three weeks or a month, they were naturally disturbed when deliveries had to run into months and months. Factories were sending orders for rush delivery and making every effort to replenish and maintain their stock. When, however, buyers had reached that psychological state that they finally were satisfied that deliveries could not be made in as short a time as formerly, they accepted the situation as such, and made their plans accordingly. As a consequence, even though the deliveries are two, three, four, and sometimes more, times longer than prior to the war, there is very little suffering compared with what there was ten months ago. Contracts are being placed now for three-months' delivery with little more feeling in the matter than when they were placed for three weeks.

It took some time for manufacturers to adjust themselves to these conditions, but it is felt a favorable result has now been achieved. Buyers of finished products, however, have been slower in accepting these conditions, but now are rapidly coming to share their manufacturer's point of view.

CURRENT PRICES FOR MATERIALS

Quoted Thursday, Feb. 8.

Copper (electrolytic)	New York, 33 cents per pound
Rubber-covered wire (base)	New York, 38 cents per pound
No. 0000 feeder cable (bare)	New York, 37½ cents per pound
No. 0000 feeder cable (stranded)	New York, 35 cents per pound
No. 6 copper wire (insulated)	New York, 35 cents per pound
No. 6 copper wire (bare)	New York, 37 cents per pound
Tin (straits)	New York, 55 cents per pound
Lead	New York, 8½ cents per pound
Spelter	New York, 10¼ cents per pound
Rails, A. S. C. E., O. H	Mill, $40 per gross ton
Rails, A. S. C. E., Bess	Mill, $38 per gross ton
Wire nails	Pittsburgh, $3 per 100 pounds
Steel (bars)	Pittsburgh, 3.25 cents per pound
Sheet iron (black, 28 gage)	Pittsburgh, 4.50 cents per pound
Sheet iron (galv., 28 gage)	Pittsburgh, 6.25 cents per pound
I-beams over 15 in	Pittsburgh, 10 cents per pound
½-in. galv. extra high strength steel wire,	New York, $6.82 per 100 ft.
⅜-in. galv. high strength steel wire	New York, $3.41 per 100 ft.
⅜-in. galv. Siemens-Martin wire	New York, $2.52 per 100 ft.
5/16-in. galv. Siemens-Martin wire	New York, $1.94 per 100 ft.
Galvanized barb wire and staples	Pittsburgh, 3.85 cents per pound
Galvanized wire (ordinary)	Pittsburgh, 3.65 cents per pound
Cement (carload lots) with rebate for sacks,	New York, $2.07 per barrel
Cement (carload lots)	Chicago, $1.96 per barrel
Cement (carload lots)	Seattle, $2.60 per barrel
Sand in large lots	New York, 50 cents per ton
Sand in large lots	Chicago, $1.25 per ton
Linseed oil (raw, 5-bbl. lots)	New York, 95 cents per gallon
Linseed oil (boiled, 5-bbl. lots)	New York, 96 cents per gallon
White lead (100-lb. keg)	New York 9¾ cents per pound
Turpentine (bbl. lots)	New York, 52½ cents per gallon

OLD METAL PRICES

Copper (heavy)	New York, 29½ cents per pound
Copper (light)	New York, 24½ cents per pound
Red brass	New York, 19 cents per pound
Yellow brass	New York, 18 cents per pound
Lead	New York, 7.25 cents per pound
Steel car axles	Chicago, $34 per net ton
Zinc	8 cents per pound
Iron car wheels	Chicago, $18.50 per gross ton
Steel rail (scrap)	Chicago, $24.50 per gross ton
Steel rail (relaying)	Chicago, $30 per gross ton
Machine shop turnings	Chicago, $9.25 per net ton

Railways to Purchase Coal Mines

In order to improve existing fuel conditions on their various properties, the General Gas & Electric and Eastern Power & Light Companies, New York City, some time ago took under advisement the policy of furnishing fuel to their subsidiary properties through the purchase or lease of some desirable coal properties. A careful investigation was made of certain coal mines then on the market, and options have been taken on them. The closing of these options will depend upon tests now under way at the plants of subsidiary companies under actual operating conditions. Special attention has been given to the matter of cars and transportation facilities in selecting the location of these mines, and it is felt that satisfactory service is assured.

ROLLING STOCK

Eastern Pennsylvania Railways, Pottsville, Pa., are in the market for five car bodies to replace the equipment lost in a recent fire.

Tacoma Railway & Power Company, Tacoma, Wash., plans to spend $70,000 for new cars. In addition, heaters will be purchased for twenty-one cars not having them at present.

International Railway Company, Buffalo, N. Y., has purchased five wooden passenger coaches from the Pennsylvania Railroad and will have them rebuilt for use on the new Buffalo-Niagara Falls line which will probably be placed in operation in the spring. The electrical equipment will be furnished by the General Electric Company.

Interborough Rapid Transit Company, New York, N. Y., is in the market for 310 steel subway cars, 217 of which are to be motor cars and ninety-three trail cars. An option to purchase an additional 167 car bodies of which 120 will be motor cars and forty-seven trail cars is included, and will be exercised within six months of the date of the proposal.

Boston (Mass.) Elevated Railway, noted in the ELECTRIC RAILWAY JOURNAL of Jan. 27, 1917, as having purchased thirty-five steel cars for service in the Cambridge subway and Dorchester tunnel extension to Andrew Square, has specified the following details for this equipment:

Builder of car body, Pressed Steel Car Company
Type of car......Closed, motor
Seating capacity...Seventy-two
Weight (car body only), Approx. 41,360 lb.
Bolster centers, length, 51 ft. 0 in.
Length of body, 69 ft. 2½ in. over bumpers
Width over sills.......9 ft. 6 in.
Width over all........9 ft. 6 in.
Height, Rail to top of floor 50 in.
Body ....Metal
Interior trim ....Enameled
Roof, type..Modified steam car
Underframe ....Metal
Air brakes ......Westinghouse
Axles ....Carnegie Steel
Bumpers ...Hedley anti-climber
Cables ....Westinghouse
Control...Westinghouse automatic line field control
Couplers..Tomlinson, Ohio Brass
Door operating mechanism, National Pneumatic
Gears and pinions.Westinghouse
Journal boxes.......Symington
Motors, type and number, 2 West. 557-A-1
Motors ....Inside-hung
Seats, style ....Longitudinal
Seating material ....Carpet
Trucks, type, Brill 27 MCB-2 and 3
Ventilators ....Perry
Wheels, Trailer 31 in., motor 34 in.

The cost of these cars complete will be about $18,500 each, compared with $11,415 each for similar cars in 1912. Delivery will be made in September of this year.

TRADE NOTES

Farley Gannett, consulting engineer, Harrisburg, Pa., has changed the firm name to Gannett, Seelye and Fleming. Mr. Seelye has been a member of the firm since its organization, Aug. 1, 1915, and Mr. Fleming since February, 1916. On account of expanding business, the firm has found it necessary to change the location of its offices, and after Jan. 15 will occupy offices at 204 Locust Street, Harrisburg, Pa.

General George W. Goethals announces that he has opened consulting offices in the Wall Street Exchange Building, 43 Exchange Place, New York. He has associated with him experienced specialists and will engage in a general consulting practice in civil, electrical, mechanical and hydraulic engineering. Special attention will be given to examinations and reports on canals, harbors, dry docks, terminals, dams, water-power development, water supplies, purification of tropical waters, refrigeration, reinforced concrete structures, organizations, management and public utilities.

Walter Kidde, engineer-constructor, New York, has incorporated his organization under the title of Walter Kidde & Company, Inc., with headquarters at 140 Cedar Street. Mr. Kidde began business in 1900 and has done a large amount of work in the construction and equipment of factories. One of his most recent commissions is the plant of the American Hard Rubber Company, at Akron, Ohio. The officers of the new company are: Walter Kidde, president; B. G. Worth, vice-president; I. R. Lewis, secretary and treasurer. These are all members of the board of directors, which also includes Henry Lang, who is vice-president of the Ingersoll-Rand Company, and E. S. Boyer, who is associated with the American Hard Rubber Company.

ADVERTISING LITERATURE

Cooper-Hewitt Electric Company, Hoboken, N. J., has prepared bulletin No. 67, descriptive of its P, L, H and K lamps for direct-current indoor lighting.

United Hammer Company, Boston, Mass., is distributing a twenty-four-page booklet on Fairbanks power hammers. In this booklet, five different types of hammers, made by this company, are described and illustrated.

Harrison Safety Boiler Works, Philadelphia, Pa., has issued publication No. 710 on "Cochrane" heaters for use in heating, metering and softening water for boiler feed and other purposes.

Westinghouse Lamp Company, New York, N. Y., announces the construction of a large factory at Trenton, N. J., for the manufacture of incandescent lamps. The site for the factory covers about five acres, upon which will be built a plant of 200,000 sq. ft. of floor space. The contract has been awarded to the Stone & Webster Engineering Association and the cost of the buildings and equipment will amount to more than $1,000,000. When in full operation, the lamp factory will employ about 600 people, manufacturing approximately 1,500,000 Westinghouse Masda lamps per month.

Harvey Fisk & Sons, New York, N. Y., have issued 'United States Bonds, Historical and Descriptive," a seventy-four page pamphlet which contains an historical sketch tracing the fluctuations in the Government's debt from about $75,000,000 in 1791 down to the present time when the debt amounts to less than $1,000,000,000. The different outstanding issues of United States Government bonds are described. The portions of the Federal Reserve Act dealing with the refunding of United States bonds are analyzed and all rulings in regard thereto of the Federal Reserve Board and of the United States Treasury Department are printed. Existing provisions of law for new issues of United States bonds are clearly set out.

NEW PUBLICATIONS

Bridge Engineering. By J. A. L. Waddell, LL.D., consulting engineer. John Wiley & Sons, Inc., New York, N. Y. Two volumes. Vol. 1, 1064 pages; Vol. 2, 2177 pages. Cloth, $10 per set.

Dr. Waddell has put into this great work the cream of a lifetime of study and application in this special field. The treatment is, of course, most exhaustive. Practical suggestions regarding bridge design and construction are given, as well as charts and data for making cost estimates for bridges and structures of any sizes yet attained, or for approximating weights of metal in spans of unprecedented dimensions.

Safe Practices. Edwin R. Wright, editor. National Safety Council, Chicago, Ill.

The Council is reporting the results of its investigations on accident prevention summed up in monthly pamphlets. The first issue is on the subject of "Ladders," and it contains a brief review of the safety movement. The second is devoted to the subject of "Stairs and Stairways," and the third issue, just published, is entitled "Boiler Rooms." It is intended in this way to deal with various subjects separately and furnish information so that it can be preserved for reference. Details regarding the Council's activities can be obtained by application to W. H. Cameron, general manager.

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TWO FEATURES AT MID-YEAR MEETING

In the Boston meeting two features may be said to have been paramount. One of these relates to the industry itself—the purpose of the gathering—the other to the subject of the national defense. As is clearly evident from the program, which may be assumed to reflect the best thinking of the industry, the relation of employer and employee transcends in importance all other matters excepting only that of the relation of the electric railways to the public. The necessity for basic knowledge of fundamental principles of wages, costs of commodities, living conditions and the like, is clearly seen in the reports and papers presented. The old order of affairs was graphically described in the introductory remarks of James O. Fagan, the tower signalman, whose magazine articles have made his name well known. The new order was well illustrated by the report of the committee on social relations upon methods of securing the economic independence of the employee, increasing his habits of thrift, and caring for him and his family in case of death, incapacity or old age. The topic is a modern one, and many theories are being advanced as alleged remedies for this and that condition. In these circumstances the value of a scientific consideration of the subject such as that given by the committee on social relations cannot be overestimated.

ELECTRIC RAILWAYS BEHIND THE PRESIDENT

The patriotic resolutions adopted at Boston and forwarded to President Wilson are significant in several particulars. The backing of an industry so important as ours cannot but be appreciated by the President in this hour of stress. Not only can the railways be of help in a material way in assisting in the transportation of troops and supplies, but in the matter of men, also, they are in a position to be of prompt and effective service. Their men are under discipline somewhat analogous to that in the army. They are accustomed to learning and following rules, to work of a routine nature necessary to the public service, to responding to emergency calls of various kinds and even to the wearing of uniforms. If needed for service they will, no doubt, respond to their country's call as their brothers did so freely in Great Britain before conscription was resorted to. The committee on national defense, as it is now called, has done well to utilize the opportunity afforded by the mid-year meeting for focusing attention upon the patriotism and enthusiasm of the electric railways. We expect them to be an important factor in any eventualities which may result from the present international tension.

GIVING THE EMPLOYEES A CHANCE

Do you, as an electric railway employer, look outside your organization whenever a man is needed for a more or less advanced position, or do you endeavor to find among your own employees one qualified for the work? This point has been brought to our attention with special emphasis through a recent advertisement in the *Denver Tramway Bulletin* for an engineer to do certain work, it being stated therein that it is the policy of the company to make appointments from within the organization if the right man can be found. Such a policy is immeasurably preferable to that first mentioned, which cannot but result unfortunately for both employees and the organization. When outside men are persistently brought in to fill vacancies without consideration of the qualifications of any existing employee, the practice tends to undermine the ambition of the employee or else eventually leads him to seek work where his future is not so narrowly and unjustly restricted. In either case the company is harmed. What present-day employees want is a fair chance and this should be insured by the management. In this connection we were struck by a recent remark of President Brush of the Boston Elevated Railway, who said: "My job is to make my fellow employees make a success of theirs."

A NEED FOR SPECIALISTS EXISTS

In the case of individuals that have been engaged in electric railway work there appears to be a relatively large opportunity for specialized service during war. For example, electric railway operators are especially well fitted to deal with the problems of detailed distribution which seem to form so important a factor in modern warfare. According to report, it is quite frequently the practice on European battlefields, where troops are deployed over a wide front served only by steam railroads at right angles to it, to construct light railways behind the trench lines and thus maintain a steady stream of munitions along the front. Here should be much for the electric railway man to do in the way of operation—whether steam or electricity happens to be the motive power. In construction work, the services of those who have had experience with maintenance of way on interurban properties should be literally invaluable. All of them have dealt with the laying and repair of track in the open country under conditions that should be more nearly comparable to the rough-and-ready methods of war time than the principles of elaboration and permanence that have become standard for steam railroad practice. In case this nation should take the field there would probably be a great need for specialists along this line and many others.

HALF A LOAF BETTER THAN NONE

Such a maxim may be appropriately used in describing the financial nourishment which, as noted in last week's issue, has been recommended for the Boston Elevated Railway by the special legislative commission appointed to investigate its needs. It was perhaps too much to expect that out of this short investigation any radical departures in the way of revenue increases would be advocated. The investigating commission did well in making a thorough beginning and in frankly going on record as to a disposition to meet fairly the company's immediate and most pressing needs. The management of the Boston company, both present and past, has reason for congratulation in the clean-cut endorsement of its work which may be read between the lines of the full report. The declaration made by the commission that no "water" exists in the Boston Elevated securities will surprise no one familiar with the company, but this statement, with other straightforward comments upon the conditions which handicap the road, will be of value in insuring a wider public appreciation of the company's problems and honest endeavors to perform its duty to the mutual benefit of itself and the public.

The commission feels that the immediate needs of the company will be met by the sale of the Cambridge subway and bridge approach (costing about $9,000,000) to the State, by the return of a $500,000 guarantee fund, by the institution of further prepayment areas where practicable, by the abatement of a portion of the so-called compensation tax and by other steps outlined in last week's abstract. It considers, however, that a more thorough investigation of the efficiency and earning possibilities on the system would be helpful and recommends such a study by the Public Service Commission during the next twelve months. Moreover, the commission believes that a comprehensive investigation of future subway development at Boston may well be undertaken by the Boston Transit Commission in conjunction with the broader inquiry into the net earning power of the company. It recognizes the fairness of the municipality's sharing in the expense of high-cost transit facilities, but it is not yet ready to advocate a positive subsidy or taxation abatement. Fare increase and transfer charge plans must await further investigation, including operating experience under present fares.

"So far, so good," is doubtless a fair characterization of such findings. In trying to reconcile two elements which to it seem opposed—*i. e.*, the company and the riding public—the commission has set up a dividing line between recommended present relief and possible future relief. In other words, it advocates now only such relief to the company as will impose no additional burdens upon the public, but it is fair-minded enough to leave open for future decision the question of the necessity of more direct contributions from the public.

The moral value of the report, even with its limited findings, should be great, for it gives official recognition to public responsibility for successful utility operation. It is to be hoped that the material value of the report will also be realized. If the recommendations of the commission are enacted into law at the present session, the company can serve the public better than is at present possible under the limitation of not being able to issue further securities, and it will, we trust, make at least a close approach to a fair dividend. The latter must be assured in the long run if the scheme of private ownership of a great city traction system under public regulation is to succeed.

PENSIONS FOR ELECTRIC RAILWAY EMPLOYEES

The sub-committee on social relations of the American Association, it will be recalled, began its vitally important work at the last October convention with a comprehensive report on the three elements of "protection" for employees, *i.e.*, life, health and accident insurance. At the mid-year meeting in Boston this week the committee, which has been separated from the committee on public relations and is now a full committee, made further commendable progress in a report to which the greater part of the day was devoted.

In brief, the report contains, first, a discussion of pension theory and practice, with which the committee concludes the "protection" part of its study. It then begins the second part of its work, or that dealing with "betterment" of employees through such means as the best form of wage payments, minimum wage laws, education, thrift, profit-sharing, etc. Along the line of social relations electric railways have probably done as much as any industry in the country, but the scattered plans in use have not before been collated and analyzed in a thorough-going way. In doing this very thing the committee is performing a most valuable service to electric railways, and we hope that appreciation of its efforts will find expression in a careful study of its work as a guide for the future.

To take up the present section of the committee's report, it may be noted that pensions for employees have not been adopted so widely in the electric railway field as have other parts of the "protection" program. Only twenty-five companies have such systems, whereas 118 companies have benefit associations which provide sickness and accident disability benefits, medical supervision and death benefits. The industry, however, is well advanced when compared to other pension agencies. Only four out of 110 trade unions profess to pay superannuation benefits, social insurance evidently being considered by them a matter of secondary importance. Moreover, underwriting agencies for pensions are limited, and their policies are not taken largely by the employees most in need of pensions, and are generally costly. State subvention for indigent old age—as popular as it is abroad—has not been adopted here and would in any event, on account of its comparatively greater cost, probably be limited to real charity cases.

All this, we think, simply tends to show that electric railways have a wide opportunity for constructive work along pension lines. Without going into the technical details of terms, recessions, deaths, etc., it seems to us that any company in undertaking to establish a pension system must settle two points. Firstly, it should be certain that its plan is actuarily sound. The curse of many municipal and state pension systems has been the necessity for great modifications or even abandonment on account of poor advice and improper determinations of probable cost. The committee has presented an able summary of the cost factors to be considered, but it would, we are confident, be the first to deprecate the lack of expert advice covering the future working of any particular pension system.

Secondly, a railway must decide whether or not its pension plan is to be co-operative—that is, whether it shall finance the whole system or accept voluntary or retain compulsory contributions from the employees. All electric railway pension funds now in operation are sustained by the companies. The theoretical discussion pro and con on this general question is voluminous, and it will not begin to approach the end until there is much more pension experience in all industries. The co-operative feature, however, means complex accounting and elaborate contractual relations between employer and employees, and we are not certain that its conceded merits are worth the trouble of applying it to all parts of employee protection. If we understand the committee correctly, it feels that the preferable protection system would embody a minimum pension plan financed by the company as at present but supplemented by a voluntary contributive plan to provide insurance and promote thrift. On the other hand, Edward E. Rice, in his written discussion of the committee's report, suggests that insurance be handled under the group plan entirely by the employer, and that the co-operative feature be secured through accumulation of pension funds by joint contributions of employers and employees. Alike in principle, therefore, as to the partial use of the contributive feature, these proposals apparently differ as to the part of the social program to which this feature should be applied. Without many experience data on this point, it will be unwise to predict definitely which scheme is more practicable, but it would seem that the burden of proof should be on the plan proposed by Mr. Rice, inasmuch as the proposal of the committee to a greater extent leaves undisturbed the practices already in existence.

On the subject of minimum wage laws, we desire simply to emphasize the point made by the committee that, although as yet the existing acts of this character do not touch electric railways, they may be so extended and are at least a sign of the times. Already public thought is turning even further to the subject of state regulation of utility wages. The outcome, of course, cannot be accurately forecasted, but we believe that there is an awakening of public interest of all phases of utility operation, including labor, that will result in increasing discussion and demands for innovations. It rests entirely with electric railways whether they shall do their own thinking and broaden their social relations work through efficient use of approved methods or leave the industry in large part open to the possible imposition of sociological experiments.

SELLING TRANSPORTATION—AND IDEAS

It is difficult for many to visualize a railway man as a merchant. The merchant deals in tangible goods; the railway in intangible service, yet both have something to sell to the public, and equally need to prove the attractiveness of the offering made. Undoubtedly, each will do some business even without any special sales effort. People have to ride to some extent, just as they have to purchase a certain amount of dry goods and groceries. But to ignore the beneficial effort of salesmanship is to overlook an important factor in the success of every enterprise, whether transportation or department store.

The steam railroads pay a great deal of attention to the business of selling transportation in spite of the fact that most of their business comes from freight instead of passengers, and the opportunities for increasing business in freight, under most conditions, is less than that of increasing business among passengers. One reason for this is that the shipment of freight is largely a matter of necessity while passenger travel is largely a voluntary act and can be developed as a habit. Another reason is that a piece of freight, as a rule, is shipped only once. When it reaches its destination, it is set permanently in place or consumed. With passenger travel, there is no end to the traveling which a person can do except the span of his life. Hence, railways whose business consists largely of passenger travel have greater inducements to develop the traveling habit in their public than those whose business consists largely of freight.

But the sale of transportation is not the only way in which a transportation manager can exercise that talent which consists of being able to convince others that they should accept his ideas. As Mr. Frothingham said in Boston yesterday, the manager has to sell to his trainmen the idea that service with his company is a desirable one as regards hours, wages, working conditions and permanency of employment, when compared with other lines of work in the same town in which they might engage. He has to sell to the authorities of town and state the belief that the service which he supplies is as good as is warranted by the fare paid or, perhaps, that the fare is not an adequate compensation for the service given. He must sell to the public directly served the thought that the local transportation system should be encouraged to make such extensions and other improvements in the service as necessity requires from time to time.

In most of the sales transactions of this kind which the manager has to conduct, he is obliged to meet his patrons by proxy, just as the dry-goods merchant has to conduct his business through salesmen and saleswomen. In transportation service, the sales are conducted largely by the trainmen, and, as Mr. Frothingham says, "there is just as great an opportunity for good salesmanship between the operating men and the public as there is between a merchant and his customer. The principle is the same in both cases, only you, perhaps, have never thought of it in just that same way."

Pensions and Minimum Wage Laws[*]

Survey Presented to American Electric Railway Association to Show Present Pension Practice, with Analysis of Cost Factors—Terms and Conditions of Industrial Pensions—Corporation Support of Pensions—Types of Minimum Wage Laws, with Results and Future Tendencies

By JAMES D. MORTIMER, Chairman
HENRY C. BRADLEE EDWIN W. RICE, JR.
Composing the Committee on Social Relations of the
American Electric Railway Association

A PENSION has been defined to be "a stated allowance to a person in consideration of past services," or "a payment made to one retired from service because of age, disability or other cause." Pension systems have been designed for every purpose from rewards to poor relief. Industrial pensions—that is, pensions to retiring employees—belong in the former rather than in the latter category. Among the various pension plans of electric railways the purposes are described as "in recognition of long and faithful service" or "fidelity and endeavor to advance the interests of the business," "to encourage employees to remain in the service a sufficient time to develop capacity and acquire experience," etc. The purpose of corporation pensions is to finance the retirement from active service of employees who have devoted their productive period to the service, so that efficiency may be maintained, promotions facilitated and employment made more attractive. The idea of securing the greatest permanence of service is perhaps the most important motive. The veterans are an asset to any institution. The purpose is far removed from any desire to be charitable to the "jobless, helpless, homeless, incomeless and propertyless old man of fifty," as Rubinow defines it.[1] Industrial pension systems now in operation in the United States do not limit the pension to those who are in need, but grant it to every employee who retires after the specified term of service at the designated pension age, without reference to the financial condition of such employee, his income, dependence or his family's needs.

James D. Mortimer, chairman of the committee on social relations, presented at the last convention a most thorough report on life, health and accident insurance under electric railway conditions. This committee's report at Boston is equally instructive.

SURVEY OF PRESENT PENSION PRACTICE

Available data as to the expansion of the pension movement are impressive. A review of the field[2] indicates a definite tendency to more liberal pension provisions, but unfortunately, also an utter disregard of the first principles of financing such plans.

While no state has enacted any law for a general system of old-age pensions, many have passed enabling acts under which municipalities may pay pensions to certain employees.

Generally these are the members of fire, police and water departments, teachers in public schools and employees of public libraries, etc. Senate Document 427, dated March 11, 1910, outlines 219 pension systems for municipal employees, comprising forty-eight teachers', eighty-six firemen's, eighty-one policemen's and four miscellaneous funds, covering thirty-one states and ninety-nine cities. According to data furnished by the commission on pensions of the city of New York to the National Civic Federation and contained in its 1916 report, such plans are now in operation in 228 cities. The essential features of these plans are thus summarized by Leonard Blakey in this report:

> "For the funds for firemen, seven of the first eighteen cities of the United States do not require contributions, while eleven require from 1 per cent to 2½ per cent, ranging from $8.70 to $29.94 per year. Thirteen of the cities fix the pension at one-half the final salary. In twelve the age of retirement is not stipulated. In the others it ranges from fifty to sixty years. The required length of service for retirement ranges from fifteen to twenty-five years, it being in twelve cities fifteen years; in eight, twenty; in two, twenty-two, and two, twenty-five. Except in Pittsburgh, widows and dependent children uniformly share in this pension.

It is maintained by many actuaries that the larger number of municipal pension plans in force in the United States have been established without expert advice and proper actuarial determination of the probable cost, and that these systems will have to be either greatly modified or altogether abandoned. Frederick L. Hoffman in a paper on "American Public Pension Systems and Civil Service Retirement Plans," read before the Seventh International Congress of Actuaries, says:

> "It is evident that American military and most of our state and municipal systems have been developed with an entire disregard of acturial and general insurance considerations. As a result an enormous liability has accrued, which must needs constitute for years to come a serious financial burden on the people at large."

A similar conclusion is reached by Henry L. Rietz in a paper before the American Institute of Actuaries.[3] Evidence of the very substantial liabilities accruing in municipal pensions plans is forthcoming from various actuarial examinations.

George E. Buck, actuary for the pension commission of New York,[4] states with respect to pension systems in New York City:

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[*] Abstract of a report presented before the American Electric Railway Association at Boston, Mass., Feb. 16, 1917.

[1] Rubinow—"Social Insurance," page 302.

[2] A chronological survey of pension movement may be obtained by reference in order to Twenty-Third Annual Report, 1908, United States Commissioner of Labor; "Workmen's Insurance Benefit Funds in the United States"; Senate Document 427, Sixty-first Congress, second session, March 11, 1910, "Pension Funds for Municipal Employees and Railroad Pension Systems in the United States"; Lee W. Squires—"Old-Age Dependency in the United States," 1912; I. M. Rubinow—"Social Insurance," 1913; Tenth Annual Report—The Carnegie Foundation for the Advancement of Teaching, 1915, and "The Problem of Pensions," as presented at the sixteenth annual meeting of the National Civic Federation, January, 1916.

> "The valuation of each fund has now been completed and the total liability of the entire system determined. In round numbers such liability is $216,000,000. Of this amount $9,000,000 is provided by employees' contributions, and there remains a deficiency of $203,000,000 after deducting the funds in hand. Possibly $30,000,000 will be available from the indirect contributions of the city to cover this."

A report to the Massachusetts commission on pensions by Herbert D. Brown, dated March 16, 1914, and covering an actuarial examination of the pension funds of Boston, discloses a deficiency as of Jan. 1, 1914, of $1,312,687, according to H. L. Rietz. The permanent school pension fund of the same city is reported to have a deficiency of $3,728,095 as of the same date, and the firemen's pensions fund a liability of $3,657,100. All of these estimates represent the present value of obligations assumed which should have been provided for through the creation of adequate reserves.

Out of 110 national trades unions only four pay a superannuation benefit.[5] In general, only about 11 per cent of the total benefit payments is spent for purposes of sickness and less than 2½ per cent on superannuation benefits.[6]

Corporation Pensions

The so-called corporation pension plan, providing for retiring allowances financed by the corporation after a certain attained age and years of service, is being adapted by an increasing number of companies. It was first placed in effect by the Baltimore & Ohio Railroad in 1884. Where less than twenty such plans are mentioned in the 1908 report of the United States Commissioner of Labor, fifty-eight pension systems are outlined in the 1915 report of the Carnegie Foundation for the Advancement of Teaching, while fifty-five are contained in the National Civic Federation report of January, 1916. These lists are evidently incomplete.

There is some similarity in these various corporation plans. A period of service is required of from fifteen to twenty-five years. The age of retirement ranges from sixty to seventy years. The amount of pension is based upon a percentage ranging from 1 per cent to 2 per cent of the average wage at time of retirement multiplied by the number of years in service.

Electric Railways

Tabulated returns of the electric railway industry disclose twenty-five companies in the United States with pension systems. Of these thirteen provide compulsory retirement at the age of seventy, one at the age of sixty-five and the remainder at the option of the management. Thirteen likewise provide optional retirement at the age of sixty-five and five at the age of sixty. Of twenty-one pension systems reporting period of service required eight require twenty-five years, eleven twenty years and two fifteen years of continuous service prior to receipt of pension. The amount of pension varies over a wide range. Six plans specify a fixed monthly amount ranging from $20 to $35. Five specify a varying monthly amount conditional upon term of service and other factors, ranging from $15 to $25 and from $20 to $40 a month. Nine systems provide a pension equal to a percentage of the salary for the last ten years, for each year of continuous service. Of these nine, in four instances the percentage is 1 per cent, in one instance 1¼ per cent, in two instances 1½ per cent, and in two instances 2 per cent. Five systems provide a pension as a percentage of the average wage for the last ten years irrespective of years of service. This percentage ranges from 20 to 50 per cent. In all instances the pension plan is financed exclusively by the employing company.

COST FACTORS IN PROVIDING PENSIONS

Just as the most important factor in the cost of life insurance is the chance of death at future ages, so the probable length of time of survival at the retiring age is the important factor in the cost of providing annuities or pensions. According to the American experience table, out of 1000 persons at the age of twenty, 625 will attain the age of sixty, 532 the age of sixty-five, and 416 the age of seventy. At the age of sixty the expectation of living will be 14.10 years, and at the age of seventy the expectation will be 8.48 years. It is frequently claimed that the American experience table assumes a higher rate of mortality than obtains in practice, and accordingly in the valuation of annuities it is usual to employ the McClintock table. This table provides an expectation of life at the age of sixty of 14.64 years. While it is undoubtedly true that the American experience table overstates the probability of death, it appears to err on the side of safety.[7] It has accordingly been used in the cost estimates presented in this report.

Without interest a life annuity of $1 a year payable at the age of sixty and thereafter would cost $14.10 under the American experience table. Interest will considerably reduce this obligation. If payment is made at the end of each year the present value of the pension liability when the age of sixty is attained will amount to $10.44 with interest at 3 per cent, $9.65 with interest at 4 per cent and $8.33 with interest at 6 per cent per $1 of pension. The latter percentage has been used in calculating the pension premiums in this report. A pension of $300 a year would require an outlay, if the age of sixty is chosen as the year of retirement, of $1 less than the convenient figure, $2,500. A pension of $600 a year would require a saving at sixty of about $5,000.

On the assumption that a pension of $300 a year corresponds with an average wage of $800, the total reserve required for the pension would be more than 20 per cent of the wages for the preceding fifteen years of service. This does not mean that 20 per cent of the payroll during the fifteen-year period is required for the pension reserve. Interest would again reduce the amount of annual computation; a number of employees between the ages of forty-five and sixty years would die, and some would retire from service before attaining the pension age. This latter factor of retirements or recessions is most important in effecting a saving in cost in the usual pension system.

Finally, as is the case with all enterprises, there are administrative or overhead costs necessary to operate the plan. Where these consist only of an additional pension payroll, the costs are necessarily less than where costs of agency and solicitation must be added to the net premium rate.

Any consideration of the total net cost of a pension system requires a definition of the character of the plan. The pension plan may be financed entirely by the employer. It may be financed wholly, or in part, by the employee. In the former case there would be no ques-

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[3] H. L. Rietz—"The Status of Certain Current Pension Funds," American Institute of Actuaries, Vol. III, No. 7, June, 1914.

[4] George E. Buck—"Valuation of Pension Funds, With Special Reference to the Work of the New York City Pension Department," Proceedings of the Casualty, Actuarial and Statistical Society of America, Vol. II, Part 3, No. 6.

[5] Andrews Commons—"Principles of Labor Legislation." 1916, page 397.

[6] Rubinow—"Social Insurance," 1913, page 391.

[7] The combined experience table used by J. D. Craig as a pension cost basis in his report on "Actuarial Analysis of the Cost of Maintaining Various Forms of Insurance Relationship"—Appendix A, report public policy committee National Electric Light Association, 1912 Proceedings, assumes a life expectancy at the age of sixty of 13.77 years. The British Institute of Actuaries' healthy male table has a life expectancy at sixty of 13.81 years and the Northampton table of 13.21 years. The Bureau of Census United States life table, based upon federal census returns in 1910 in the registration area, shows an expectancy at the age of sixty of 13.95 years for males and 14.90 years for females.

TABLE I—SINGLE PAYMENT NET COST OF A LIFE ANNUITY OF $1 PAYABLE AT THE END OF THE SIXTIETH YEAR AND EACH YEAR THEREAFTER

When Payment Is Made at Age of	(a) Without Return of Premium in Case of Prior Death But with Return of Accumulated Reserve in Case of Recession	(b) With Return of Premium and 6 Per Cent Interest in Case of Prior Death or Recession	(c) With Insurance of $8.33 in Case of Prior Death or Return of Accumulated Reserve in Case of Recession
20 years	$0.506	$0.810	$1.557
25 years	0.705	1.084	1.787
30 years	0.983	1.450	2.097
35 years	1.374	1.941	2.516
40 years	1.928	2.597	3.083
45 years	2.765	3.476	3.917
50 years	3.859	4.652	4.880
55 years	5.584	6.225	6.302
60 years	8.330	8 330	8.330

TABLE II—ANNUAL PREMIUM NET COST OF A LIFE ANNUITY OF $1 PAYABLE AT THE END OF THE SIXTIETH YEAR AND EACH YEAR THEREAFTER

When Payments Are Begun at Age of	(a) Without Return of Premiums in Case of Prior Death But with Return of Accumulated Reserve in Case of Recession	(b) With Return of Premiums and 6 Per Cent Interest in Case of Prior Death or Recession	(c) With Insurance of $8.33 in Case of Prior Death or Return of Accumulated Reserve in Case of Recession
20 years	$0.0352	$0.0538	$0.1067
25 years	0.0508	0.0748	0.1288
30 years	0.0744	0.1054	0.1587
35 years	0.1114	0.1518	0.2041
40 years	0.1730	0.2264	0.2767
45 years	0.2853	0.3579	0.4041
50 years	0.5275	0.6320	0.6669
55 years	1.2983	1.4778	1.4845
60 years	8.3303	8.3303	8.3303

tion as to forfeiture of all rights to the pension benefit in case the employee failed to attain the pension age. In the latter case it is certain that the employee would desire the return of his contribution in case he left the service or would desire his family to fall heir to his savings in case of premature death. If he were possessed of prudent forethought he would desire to have the entire saving, which it had been planned would be accumulated at his age of retirement, available as insurance in case of death.

Net costs of pensions may accordingly be computed on three different bases:

(a) Cost without return of premium in case of death before attaining the age of retirement, but return of accumulated reserve in case of leaving employment either to the employee if contributed by him or to the corporation if it has financed the plan.

(b) Cost with return of premium and accumulated interest in case of either prior death or retirement.

(c) Cost with payment of the entire reserve to be accumulated by the age of retirement as insurance in case of death, and return of accumulated reserves in case of retirement before reaching the pension age. This later plan is in fact an endowment maturing at the pension age for an amount equal to the pension reserve.

It has been pointed out that an accumulation of $8.33 at the age of sixty is necessary with interest at 6 per cent to provide a life annuity of $1. A single payment to assure this annuity if made at an earlier age will be considerably less than this amount, owing to the fact that the payment will have an opportunity to compound itself at 6 per cent interest and many persons for whom such an annuity is provided will die before it is necessary to provide annual payments. Such single payments for the three plans described will amount as shown in Table I.

In accumulating the pension reserve the single payment plan is usually considered impractical because of the large initial investment it involves. In order to average out the payments to the reserve an annual equivalent or premium payable at the beginning of each year until the annuity is entered upon is a preferable plan. These flat annual payments will be greater for employees of advanced ages than for younger employees. At the age of sixty, when only one payment can be made before the annuity period is entered upon, it will equal the single payment for a lump-sum premium. Annual premiums at typical ages for a $1 annuity under the three plans are given in Table II.

The premiums already calculated are sufficient to provide pension annuities for all survivors from death at sixty years, but do not take account of the savings effected by employees leaving the service. Since the purpose of the pension plan is to promote longer terms of service, the saving resulting from this recession may be expected to decrease and cannot be discounted in the annual premium rate. It is desirable, therefore, to credit pension expense with the accumulated annuity reserve as such recessions occur. These values will vary with the age at which premiums were first accumulated and with the number of years of accumulation. Typical values of a reserve to pay $1 annuity at sixty under plan (a) are given in Table III.

The reserves in case of plan (b) are equal to the past premiums paid and interest to date, since the reserve is not increased as in the case of plan (a) by the amounts contributed by deceased members. The reserves in case of plan (c) are less than the premiums paid in and interest, since the fund has been decreased by the insurance paid on members dying. Typical tables of such reserves have been discussed in the consideration of life insurance.

The problem of valuing pension funds is often needlessly complicated by considerations of the probability of recession, some actuaries constructing new tables to care for both death and retirement from service. Necessarily the probability of recession will vary and such tables then become useless.

Where the entire pension plan is borne by the employer, as in case (a), the fund to be accumulated if the system is to be solvent can be readily accounted for and corrected from time to time by the following procedure:

(a) Preserve as a separate employees' record, census cards for all employees to whom the pension system applies, thirty years or over, who have been in the company's employ for one full year, noting age and nearest birthday and making additions and deductions annually upon each Dec. 1. Indicate the annual premium upon the face of each card.

(b) Charge "Relief and Pension Expense" and credit "Pension Reserve" annually with the aggregate of annual premiums upon each Dec. 1, plus 6 per cent upon the credit balance to "Pension Reserve" upon that date.

(c) Credit "Relief and Pension Expense" and debit "Pension Reserve" upon each Dec. 1 with the aggregate value of accumulated annuities for employees who have left service during the year.

(d) Charge "Pension Reserve" with special pension payroll, crediting cash as payments are made.

TABLE III—VALUE OF ACCUMULATED RESERVE AT VARIOUS AGES OF LEAVING SERVICE

Age from Which Annual Premiums Were Paid	Annual Premium	25	30	35	40	45	50	55	60
20..............................	$0.0352	$0.313	$0.478	$0.933	$1.527	$2.413	$3.585	$5.409	$8.330
25..............................	0.0508	....	0.255	0.739	1.350	2.257	3.464	5.332	8.330
30..............................	0.0744	....	....	0.444	1.082	2.021	3.281	5.215	8.330
35..............................	0.1114	....	....	....	0.660	1.650	2.992	5.030	8.330
40..............................	0 1730	....	....	....	....	1.034	2.513	4.724	8.330
45..............................	0.2853	....	....	....	....	....	1.661	4.166	8.330
50..............................	0.5275	....	....	....	....	....	....	2.962	8.330
55..............................	1.2983	....	....	....	....	....	....	....	8.330

It is usual to express the cost of pensions as a percentage of the active payroll. Just how large this percentage will be depends upon the liberality of the pension provisions. Less than 2 per cent of the employer's payroll is frequently stated as the extent of liability under the usual corporation plan. Very likely this represents out-of-pocket expenses at the present time, but it is very doubtful whether an adequate accumulation of reserves rather than a "pay-as-you-go" plan can be financed with so modest a contribution. Recession plays a very important part in cost, but the added stability which the pension system is designed to give to employment carries with it increasing burdens. Two railroad pension funds in France, established in the sixties, with contributions of 4 per cent of the active payroll, had increased to 12 per cent and 15 per cent in the nineties.[8] The London Metropolitan Police Force shows an increase in the ratio of pension roll to active payroll from 8.5 per cent in 1854 to 29.3 per cent in 1915. In Berlin the pension roll of all civil service employees, excluding police, amounted to 36.92 per cent of the total payroll in 1914. In France in 1912 the pension roll of the national civil service cost 17 per cent of the active payroll, and in Austria the pension roll of the civil service list was 33 per cent of the active payroll.[9] These experiences point to the necessity of accumulating adequate reserves and of valuing the liability for pensions in the method suggested.

TERMS AND CONDITIONS OF INDUSTRIAL PENSIONS

The problems of successful administration of the pension system are of an importance equal to if not greater than the consideration of cost. They may be discussed under suitable heads, as follows:

Voluntary, Compulsory and Contributive Plans

The provision made by the employer for the care of retiring aged employees may be in the nature of an annuity to which the employee himself may have in part contributed, or of a pension paid wholly by the employer with no specific contribution by the employee. If contribution is made by the employee, the amount may be compulsory or voluntary on his part.

There has been endless discussion of the question whether pensions should be contributory or non-contributory. It is argued that the employee who will most need the pension—that is, the one receiving the lowest wages—is wholly unable to make contributory payment. Furthermore, few employers deem it advisable to require that such payments shall be compulsory, and experience has shown that in a system of voluntary payments many if not the great majority of employees will fail to join. Most prudent men safeguard the welfare of their families by life insurance, but they are willing to omit any insurance as to their own subsistence after their working period is ended. They undoubtedly cling to the hope of accumulating property by which they shall maintain themselves in old age, and there is the feeling that the hour of incapacity is far away and that through disease or accident it may never be reached. There is the further difficulty that a contributory scheme of pensions is complex, as it involves extensive accounting and contractual obligations for the return of contributions in case of termination of service, default in payment or death of the employee before the pension age arrives, thus further complicating already perplexing problems as to wages and service. Moreover, all contributory systems, whether administered by employers or employees, have difficulty in resisting appeals for assistance for employees reaching the pension age who have neglected to make adequate contribution for a pension, thereby discriminating in favor of such employee.

The objections usually raised to the payment of non-contributory pensions are that they remove the incentive to thrift; that they encourage extravagance and want of forethought as to the future, and that they do not, to say the least, contribute to the self-respect of the employee. It is even alleged that such systems will exert a depressing effect upon wages and will tend to the disintegration of the family.

In this respect it is significant to note the proposed change in the Carnegie Foundation pension fund for college teachers from an endowed to a contributory plan. This plan was established in 1905 by Andrew Carnegie to provide retiring allowances for college professors in the United States and Canada with a permanent fund of $10,000,000 and an approximate annual income of $500,000. In 1908 the benefits were extended to State universities, and $5,000,000 was added to the endowment. The claims upon the fund have increased very materially since its inception. Whereas in the year 1906-7 the amount paid in pensions was $135,687, the amount had increased in 1914-15 to $554,121. The ultimate obligation, based on actuarial computations, is placed "somewhere between $1,000,000 and $1,750,000."[10] The report states:

> "The fundamental defect in the existing pension system lies in the assumption that free pensions for college teachers would be permanently justified. In the light of ten years of experience and in the light of the experience of European pension systems this assumption seems to rest upon a defective social philosophy. No permanent advantage will accrue to any calling or any profession by lifting from the shoulders of its members a load which under moral and economic laws they ought to bear.
>
> "The man of sixty-five unexpectedly presented with a pension has received a gracious gift. The man of thirty who looks forward over an interval of thirty-five years to its acceptance will pay for it in one way or another before he receives it, and it is in every way to his advantage that there shall be no obscurity as to the question of responsibility or financial certainty. It is further to his advantage that the question of salary shall be entirely separated from the question of pension."

It is proposed to establish a system of life insurance and annuities at cost and broaden the scope of the plan, the Foundation assuming the cost of administration, the cost of invalidity and widows' pensions and taxes, besides guaranteeing a return of 4½ per cent upon reserves. The Carnegie plan contemplates larger pensions than obtain in industrial enterprises, and it has been said that the beneficiaries have a better appreciation of these obligations to provide for the future and the character and working of insurance contracts. While the contributory plan has its drawbacks, there is no gainsaying its popularity, and it is possible that further developments of present pension plans will include some provision in a manner similar to that contemplated by the Carnegie Foundation.

Age of Retirement

Incapacity due to old age is usually assumed to exist at the age of seventy years for males and sixty for females, though numerous plans adopt earlier ages. It is customary to provide for optional retirement when incapacity occurs at an earlier age than that of compulsory retirement, such optional period being five years. Certain existing plans permit retirement at any age after a fixed term of service, usually twenty or twenty-five years. European pension plans usually provide for retirement at seventy, although recent tendencies have been to lower this limit to sixty-five. Sixty years may be safely assumed as the minimum or voluntary age of retirement except in cases of disability.

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[8] Rubinow—"Social Insurance," page 326.

[9] Pritchett—"A Comprehensive Plan of Insurance and Annuities for College Teachers—The Carnegie Foundation for the Advancement of Teaching, Bulletin No. 9." Data furnished by New York Bureau of Municipal Research.

[10] Pritchett—"A Comprehensive Plan of Insurance and Annuities for College Teachers." Bulletin 9, the Carnegie Foundation for the Advancement of Teaching.

Prior Disability

If the employee is incapacitated before reaching the pension age, provision is made in many pension plans for the payments of pension. Employee liability laws frequently provide for limited annuities in the case of disability sustained during employment, and in such cases the pension supplements this compensation. Permanent incapacity operates to reduce the usual life expectancy, and accordingly a pension for the expectancy assumed at the age of sixty or 14.10 years is sufficient to care for this benefit.

Term of Service

Much the larger number of non-contributory industrial pension plans provide for a minimum of twenty years' service to entitle the employee to payment of a pension. A few provide for payment upon fifteen years' service, and others require a minimum of twenty-five years of service. As the pension is based theoretically upon long and valuable service, there is a tendency to restrict the employment of persons of advanced age, many corporations refusing to take on as a new employee any person of more than forty-five years of age. It is provided that service must be continuous, and service is held to be continuous when the employee has not been discharged or has not voluntarily left the service of the employer. In cases of absence of duty through illness or layoff because of reduction of force, no deduction is made when such absence does not exceed six consecutive months. If this kind of absence exceeds six months, the period of absence is deducted from the total term of service. It is usually provided that employees of subsidiary concerns shall be classed as employees of the parent company in respect to eligibility to receive pensions. Provision is also usual in such plans that pensions may be suspended or terminated for gross misconduct, or may be paid to some member of the employee's family rather than to the pensioner himself.

Amount of Pension

The usual basis of payment in non-contributory plans is 1 per cent for each year of service of the average wage for five or ten years prior to retirement; *e. g.*, an employee whose average wage had been $1,000 a year and whose term of service had been thirty years, would receive annually 30 per cent of $1,000 or a pension of $300 a year or $25 a month. Some pension plans provide for payment of a higher percentage, and others have a varying percentage dependent upon the term of service of the employee. Most such plans provide for a maximum pension, the most common limit being $100 a month. The recently adopted plan of the Great Northern Railroad has a maximum of $75 per month or $900 a year. Many pension plans have a minimum varying from $12 to $20 a month.

In recently commenting upon the adequacy of minimum allowances provided in corporation pension plans,[11] Miles M. Dawson states:

> "In enterprises where low wages rule a minimum of at least $10 per month, or even $12 to $15 per month, should be fixed. While these amounts may suffice for the bare support of superannuated low-wage employees, especially women accustomed to serve themselves in matters such as cooking, chamber work and laundry, about $20 per month is the lowest subsistence figure for superannuated male employees.
>
> "In considering minima it is well to bear in mind that, when old-age pensions come to be provided by law, whether out of the public treasury or joint contribution, they will be fixed at some generally recognized minimum. In Great Britain this is 5s. per week, *i.e.* about $1.25, roughly equivalent here in purchasing value in ordinary time to $2.50 a week. Our standard of living is higher as well as our retail prices and rents. Probably $20 per month will be the figure here. Larger minima in service pensions or pension funds might cause a larger minimum for old-age pensions, already recognized to be reasonable, to be demanded. The minimum for total disability in workmen's compensation laws is in most states $5 a week or full wages, whichever is smaller."

If the plan contemplates a small non-contributory pension supplemented by a contributory plan under definite contract with specified surrender values in case of retirement, provision may be made for uniform minimum allowances irrespective of years of service or average salary.

CORPORATION SUPPORT OF PENSIONS

Both the contributive and non-contributive forms of pension require the financial support and supervisory assistance of the employer. In the case of contributive pensions this may take the form of contribution of a portion of the premium, contribution of the overhead cost if the contributive pension system is handled by the employees' mutual benefit association, guarantee of interest, etc.

The objections to a pension plan supported by a single industry touch largely upon the social rather than the practical aspects of the problem. It is urged that the mobility of labor is hampered, that the possibility of the pension has a tendency to tie the employee to the job and that mobility is necessary to secure higher wages or more favorable conditions of employment. It is even urged that the corporation pension plan is "an obstacle to a concerted action of labor." It is also asserted that corporation pension plans are too arbitrary and their security not absolute.

All of these objections are critical rather than constructive. While the corporation pension is only a partial solution of the old-age problem, it appears to be the only system which is being conducted on economic and business-like lines. It is designed, it is true, to decrease the annual turn-over of labor and make employment more permanent. But there can be no question that the permanence of employment is desirable from an economic standpoint for both the employee and the industry. The idea that mobility is necessary to secure higher wages and more favorable conditions of employment may have applied in an era of competitive handicraft, but it cannot be said to apply in an age of specialized industry on a large and economic scale. It clearly does not apply to the public service business. Where returns are limited, as is the case with regulated public utilities, there is no other incentive for the employer than to pay the highest possible wages afforded by the industry. In addition, it must be noted that state supervision, already concerned with prescribing conditions of labor, is now expanding its regulatory function to embrace a determination of fair wages as well as reasonable returns.

It is true that the non-contributory pension, carrying with it a cessation for the provision of old age when employment ceases before the pension age is attained, does not provide the maximum security and permanence desired by the individual employed. This is the strong argument for a contributory pension plan on a contractual basis, which will assure the return of the reserve value if and as employment is terminated.

STATE SUBVENTION FOR INDIGENT OLD AGE

The United States is the only large nation which does not provide some form of pension in the case of indigent old age. European state pension plans cover a wide and varied range of experience with state subvention.[12] Voluntary plans have been tried in France, Belgium and Italy. Compulsory plans have been tried in Germany, Austria and France, and straight pensions without direct contribution by employer or employee have been tried in Great Britain and Denmark.

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[11] Miles M. Dawson—"Service Pensions and Pension Funds," Conference on Social Insurance, Washington, December, 1916.

The most important voluntary plan is a French national old age pension fund which provides a retiring allowance of $38.42 without return of premiums in case of death, and $25.89 with return of reserve in case of death, for a deposit of $100 at the age of thirty. This plan was subsidized by providing the machinery of administration free of cost and guaranteeing the rate of return, this guarantee beginning at 5 per cent and being reduced on successive occasions to 3½ per cent with direct subsidies for pensions of less than $68.49. Belgium has tried the same plan, and Italy has recently attempted a plan of direct state subsidiaries to minimum contributors. Even with the substantial backing of the state, experience has proved the failure of these measures to meet the general problem of old age relief. The middle rather than the poorer class of people avail themselves of the opportunity, the amount of lapses is high and the pensions provided have been very small. Rubinow estimates that only 8 per cent of the working class in France, or 4 per cent of those gainfully employed, have been so insured.[13] In Italy the number of the insured is estimated at 2 per cent.

Somewhat better success has been achieved by the compulsory plans adopted in Germany, and recently in France, but the pensions are unusually small when measured by American standards. The German pension scheme provides, with the contribution of from 4 to 11½ cents a week by both the employer and employee, a pension ranging from $26.18 to $54.64 a year. The age of retirement is placed at seventy. These pension payments include direct subsidies by the state of $11.90. Employees receiving more than $476 a year are not required to insure, and payments for 1200 weeks are required to secure this pension. The French compulsory plan requires contribution of $1.80 a year by males and $1.20 by females, is limited to wage earners with income of less than $579 a year, and requires thirty annual payments. The pension age is sixty-five, and the pension amounts to $78.78 a year if contributions begin at twelve years of age, and $46.28 in the case of men and $34.71 in the case of women, where contributions begin at the age of thirty.

Great Britain provides straight old age pensions of $1.25 a week for persons over seventy having an income of less than $157.50 per annum. It is evident that such pensions would not be acceptable here with American standards of living.

Some estimate of the pension bill to the United States government, if it undertook to pay such pensions, may be made. According to the 1910 census there were 6,216,674 persons of sixty years and over out of a total population, exclusive of the island possessions and Alaska, of 91,972,266. According to the estimates of population in 1916 as disclosed in the Census Bulletin 133, this number has been increased to 102,017,312. A bill introduced by Victor L. Berger, socialist Congressman, in 1911, provided a pension of $4 a week or less on a sliding scale to all persons of sixty years or over who did not possess an income of $10 a week. Mr. Berger estimated in his speech before the House that the population affected would be 2,675,000, or 2.9 per cent of the total population in the 1910 census. With an average pension of $150 a year, or less than $3 a week, the subvention would amount to more than $440,000,000 a year.

It is apparent that any form of state subsidy in the United States as a mere measure of poor relief will require a far more substantial contribution by the government than that afforded by European countries. There is at present a demand for such pensions as more economical and a more humane public policy than institution relief.

This tendency has already made itself felt in legislation in Alaska and Arizona and in the provision for mothers' pensions, these being state subsidies to the mother on condition that she provide a proper home for the child. Nearly thirty American states have enacted pension plans of this kind during the years 1912 to 1915. It is apparent that any state subsidy plan because of its expense must be limited to the most meager form of charitable relief, and that such plans must in any event be supplemented by co-operative action on the part of the industry and its employees to care for adequate protection and a comfortable old age. This will preferably take the form of minimum pensions financed by the corporation, as is now the case, supplemented by some voluntary contribution plan which will provide insurance and a secure method for accumulating and investing savings.

MINIMUM WAGE LEGISLATION

In the United States minimum wage laws have, as yet, been applied only to women and minors and are of little direct interest to the street railway industry, because comparatively few women and minors are employed in this industry and such as are employed receive in nearly all cases more than a minimum wage. The first law of this character in the United States, however, was enacted as recently as 1912, and it is reasonable to assume that similar laws applicable to men will follow if the present laws yield satisfactory results. The inclusion of telegraph and telephone female employees under minimum wage laws suggests that the subject is of general interest to all public utilities and particularly those where opportunities for the employment of women now exist or may occur in the future under the stress of shortage of male labor. Some street railways have already recognized the tendencies of the times and have established a minimum wage for female employees; others are working toward the same end.

The steam railroads during September, 1916, experienced the partial regulation of wages by law. Massachusetts has enacted legislation limiting the number of working hours and spread of duty for street railway trainmen, and similar legislation has been proposed in other States. Publicists state that the public has a financial interest in all public utilities as long as a utility enjoys the right of eminent domain or operates under a public franchise. They urge that the utility business is different from the ordinary industrial or commercial undertaking and may properly be subjected to special laws. Accordingly greater freedom is felt by legislators in dealing with all the parts of a public utility, and one need not be surprised if minimum wage legislation is next extended to the electric railway business.

Existing minimum wage laws, shown in summary form in the table on page 288, are of three distinct types as to method of enforcement, as follows:

(a) Where the specific minimum wage is fixed by the Legislature and embodied in the statute, as in Utah and Arkansas.

(b) Where the minimum wage is fixed by the minimum wage commission, upon the investigations and recommendations of advisory wage boards made up of representatives of employers, employees and the public, and where the commission is given powers of enforcement, and a penalty of fine or imprisonment or both is provided for in case of violation of the law by payment of rates less than the minimum fixed. States having laws of this class are California, Colorado, Minnesota, Oregon, Kansas, Washington and Wisconsin.

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[12] An adequate analysis of the pension plans of foreign countries is contained in Rubinow, "Social Insurance," 1913, and Frankel and Dawson, "Workingmen's Insurance in Europe," 1910.

[13] Rubinow, "Social Insurance," page 342.

(c) Where the minimum wage is determined as in (b), above described, but where the only power of enforcement is such as results from the power of the commission to publish the names of those employers paying less than the minimum rate. States having laws of this type are Massachusetts and Nebraska.

In some of the early decisions by wage commissions wages were fixed on an hourly or daily basis, and in California a decision which went into effect as recently as April 14, 1916, is on an hourly basis for certain workers and a piece work basis for others. It is clear that this law gives no assurance to the worker that he or she will receive a living wage. The provision for a living wage is more nearly met by a limit on the minimum amount to be paid weekly or monthly, and these are the limits adopted in many recent decisions. To provide for a reasonable living wage, employment by the year, with a prescribed minimum amount to be paid for the year's work, would seem to be necessary. Apparently, this has never been attempted.

RESULTS OF MINIMUM WAGE LAWS

Of the six States in which wage determinations are actually operative, those in force in California and Kansas are of too recent date to admit of any inferences as to their working. This leaves four States, which illustrate the workings of the three principal types of law. For example, the commissioners believe that the enactment of minimum wage legislation in Utah (type "a") has secured these results:

(a) The law has been instrumental in raising the wages of a number of women and girls.

(b) It has not increased the pay roll in establishments employing any considerable number of women, more than 5 per cent.

(c) It has not caused the minimum to become very nearly the maximum wage. A much larger number of employees are drawing a wage in excess of the highest minimum than is paid the legal wage itself.

(d) Most employers admit that they have obtained increased efficiency since the law came into effect.

(e) The law has tended to equalize the cost of production or of selling among the various manufacturers and merchants.

As a result of an investigation the following inferences with regard to the working of the law in Washington (type "b") seem to be fairly conclusive:

(a) That while in the mercantile establishments, laundries and telephone exchanges 60 per cent (50 per cent in the stores) of the women employed were receiving less than the minimum wage prior to the application of the law, the wages of practically all of these workers have been raised to the minimum without serious opposition and without injury to the industries.

(b) That there has been no leveling down of wages, but, on the contrary, a larger number than formerly are receiving in excess of the wage fixed as the minimum.

(c) That the women workers have been neither dismissed nor displaced by cheaper employees, and the number replaced by apprentices or minors is reported to be so small as to be a negligible factor.

How far minimum wage legislation is successful where public opinion is the only influence to enforce the findings of the commission is well illustrated in the case of Massachusetts (type "c"). This State has proceeded very slowly in the work of establishing a minimum wage, and so far its efforts have not proved very successful, as where the employers have been opposed to the schedules adopted by the commission they have simply failed to comply with them.

FUTURE TENDENCIES AND PROBLEMS

When legislation concerning wages and calling for a large extension of the police power of the State is proposed, the creation of a commission to ascertain facts and enter orders based thereon seems to be the tendency of the time. This procedure appears better than attempting to fix wages by statute.

When a State wage commission attempts to fix wages for a given industry, it is confronted with the following considerations:

(a) Testimony of employees that their wage is insufficient, either to

(1) provide them with the bare necessaries of life, or
(2) provide them with the necessaries of life and such small luxuries as they feel entitled to;

(b) Testimony of the employer that he is paying wages as high as the profit of his business permits and that to increase wages would cause him great loss;

(c) Opinion of the publicist that increased wages and shorter hours mean lower production costs;

(d) The natural desire of all to receive a larger share of the world's goods;

(e) The differences in ability between individuals.

SUMMARY OF ESSENTIAL PROVISIONS OF EXISTING MINIMUM WAGE LAWS

Findings of Commission how enforced:	Utah	Arkansas	California Washington Wisconsin	Oregon Kansas	Minnesota	Colorado	Massachusetts Nebraska
			By law.	By law.	By law.	By law.	By public opinion.
Industries covered:	All industries.	Certain industries employing more than three females.	Practically all industries.	All industries in which substantial number women employees not paid living wage.	All industries in which one-sixth or more women employed not paid living wage.	Practically all industries.	All industries in which substantial number women employees not paid living wage.
Factors to be considered in fixing minimum wage:	Same standard for everybody throughout state. Fixed by law.	Same standard for everybody throughout state. Fixed by law.	Living wage.	Living wage.	Living wage	Living wage and condition of business.	Living wage and condition of business

(f) Competition in selling prices in the general market for the output of the employer;

(g) Differences in the plants and methods of operation of various employers;

(h) Widely varying opinions respecting the cost of the necessaries of life making up the individuals living budget and the entire absence of reliable data applicable thereto;

(i) Absence of any definite standards of living;

(j) Variations in wage paid the same occupation in other states and in different parts of the same state;

(k) Differences in skill of different employees as managers of their homes;

(l) The fact that some employees accumulate savings while others earning the same wage and supporting no larger families accumulate debts;

(m) Variation in duration of employment with season of year and condition of general business activity.

The fixing of a reasonable wage seems to be no less difficult a question of fact, opinion and judgment than is the regulation of rates and service of utilities; in point of fact, the problem now appears much more complicated. Whether minimum wage legislation will be extended or whether experience so far obtained with it has shown that it is of so little real importance in improving the status of the industrial class as to cause the sociologists to look in other directions, cannot now be predicted with any accuracy.

Under the ideal system of compensation of wage earners, the setting of minimum wages by law or regulation should be unnecessary.

[A section of the foregoing committee report on the subject of employees' thrift was presented in tentative form only and this will be published after it has been put in final form by the committee.—EDS.]

Salesmanship and Its Effect on Electric Railways*

Companies Should Really Sell Jobs to Employees and Train Them as Salesmen of Personal Service—Railways Must Appeal to the Public's Self-Interest to Enlist Its Sympathy

By ROBERT FROTHINGHAM
New York, N. Y.

PRACTICALLY every business has a peculiar lingo of its own—expressions which frequently originate in slang and are finally adopted as fundamentals in sales talk. The advertising field has two of these expressions, of comparatively recent origin, which have come into almost universal use, *viz.*, the words "selling" and "sold" as applied to a convincing argument or sales talk.

Most of us can recall the time when the expression "sold" was identical with a swindle and the word "sell" was used as a noun to express the same idea. In these days of specializing, however, where the personal equation counts so heavily and salesmanship has become an art, the advertising salesman realizes more thoroughly than the salesman in any other commercial line known to me, that in order to sell his space he must first sell himself to his prospective customer. This requires unusual intelligence, tact, judgment and discretion, and a considerable knowledge of human nature. These are the qualities that differentiate a salesman from a mere order-taker. While they hold good in any commercial line, they are absolutely vital to the success of an advertising salesman, because he has nothing to sell but an idea, a plan, a scheme, sometimes sinfully characterized as mere "hot air."

On questions of publicity Robert Frothingham speaks as an authority. He was one of the first to recognize the merit of the modern poster that is now so widely used as a medium for merchandising.

Thus the able advertising salesman, first of all, convinces his prospective client of his own mental integrity, and then if his advertising plan matches up with it we say he has "sold" his man—that is, convinced him. His next and most important job is to keep his man "sold" so thoroughly that no competitor can "unsell" him. These terms have become so current between advertisers and advertising men that we frequently hear an advertiser say he is either partially or completely "sold" on a certain plan or that he is not "sold" at all, which is equivalent to his saying that he either does or does not believe in its effectiveness and apportions his advertising appropriation accordingly.

THE LABOR LEADER IS A SALESMAN

History has failed to record when salesmanship first made itself felt in shaping the world's civilization. Numerous examples from the past and present in various fields might be cited, but perhaps one will suffice to bring the idea closely home to electric railways: The labor leader who makes his appeal to your trainmen, your linemen or your engineers and firemen is ordinarily classed as an agitator—he is accused of attempting to stir up strife. I ask you to look at him as a salesman, even though you may feel that the word outclasses his real personality. The labor leader, in organizing a group of men for the purpose of forming a union, first endeavors to attract them through offering shorter hours, higher wages and the intangible advantages of collective bargaining. His fundamental appeal is necessarily made to the men's own self-interest, as in any case of salesmanship. If you will stop for a moment and look at the matter in the spirit of salesmanship, you cannot but be impressed with the extent to which you are subjected to competition in employing skillful men, and the extent to which the management of your industry fails to employ a similar art in combating such competition.

In the last national election, the National Democratic Committee sold President Wilson to the American people on the basis of "He kept us out of war." The Republicans tried to sell Mr. Hughes to the American people on a number of different issues, such as "America efficient," "America first" and "Protective tariff," but the idea struck the public as too remote and too complicated. It lacked the personal appeal. The current political issues of the day are always sold to the people. The most successful salesman-politician puts his issue over and thereby becomes a statesman. Politics was formerly regarded as a sort of a smiling and handshaking business, the building of fences in the dark of the night, and the practice of militarism in the marshalling of votes, but the business of politics has changed of late.

For years I have urged corporations to partake freely of paid publicity. I have prescribed such publicity, not so much to have companies submit their briefs in public, but with the idea that corporations have, in addition to their manufactured products, good-will and favorable opinion to sell, and that publicity is one of the most direct means of accomplishing this object.

Business corporations marketing a commercial product spend millions of dollars annually to sell their products to the consuming public. The amounts of money thus expended by such corporations are, as a rule, comparatively insignificant when contrasted with the amounts of money they spend on productive labor in the manufacture and sale of their goods. Yet a few corporations have spent many thousands of dollars in selling jobs to their workmen. For instance, Mr. Schwab is generally regarded as one of the best steel men in the world. Nobody ever accused Mr. Schwab of being to-day the best steel chemist, the best metallographist, or the best engineer in furnace or mill design. But they have accused Mr. Schwab of being the best salesman. Mr. Schwab not only sells steel and the other products of the Bethlehem Corporation to the consuming public, but he also makes an effort to sell jobs to his workmen.

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*Abstract of a paper presented before the American Electric Railway Association at Boston, Mass., Feb. 16, 1917.

We all remember how universally Mr. John D. Rockefeller was execrated throughout the country a few years ago for his abnormal acquisitiveness. He tried to change the tide of public opinion by hiring a crafty press agent to write interesting stories of his widespread benefactions and his interest in golf, but the public wouldn't "buy" his stuff—it wasn't a salable article. Then he started in to endow various educational institutions, only to have his money turned down as "tainted." He was a very unhappy man because the public had his "number" and there was none so poor as to do him honor. But when he established the Rockefeller Institute for the purpose of scientific investigation and checking the ravages of disease amongst poor, suffering humanity, he sold himself "hook, line and sinker" to the public. The public bought him at his own valuation and promptly forgot all about the mean things they had said of him, which demonstrated after all that he was a first-class salesman. Then our kindly and paternal government stepped in and, by dissolving his big company into its component parts, increased the value of his stock 400 per cent, thus proving that "virtue is its own reward."

We find another eloquent instance of winning the public's sympathetic support by clever salesmanship in the action of the Interborough Railways of New York during the recent strike, when they appealed to the public from the blatant proclamation of the Amalgamated Association that they would "tie up every car line between Yonkers and Coney Island" unless the Interborough acceded to their demands. That was a trifle too much like "the public be damned." No swollen fool will ever say that again.

ELECTRIC RAILWAYS NEED TO KNOW SELLING GAME

The electric railway industry, as I am told, is confronted with the most serious problems of its history. You have in city service a fixed fare and rising costs of operation, costs that increase far more rapidly than the best engineering skill can overcome by improvements in the art. You all want an increase in fares, but I think I am safe in saying that very few of you know how you are going to get it. I am told that the mathematics of the subject is thoroughly understood and that almost any electric railway accountant is capable of figuring the paying haul, the cost of extending the transfer privilege and the gradual decrease in rate of return upon utility capital. I have no doubt that all of you believe these facts to exist, but from my casual inspection of the literature of the industry I have not seen in print any method offered by an electric railway man describing how he expects to "bring the rabbit home."

I am not going to offer you a solution, because the problem is rather too technical for my hands, and there are others who are paid large sums of money annually to know just these things. I feel certain that they are working on the problem with might and main. If I could, however, offer them a suggestion derived from my experience in commercial business and my contact with public opinion which would give one new idea toward the solution of the problem, it would give me unbounded pleasure.

JOBS SHOULD BE SOLD TO EMPLOYEES

I am of the opinion that the first thing which the industry should do is to sell the jobs to its employees. This selling cannot be made effective or accomplish its fixed purpose by the adoption of the so-called welfare plans, the organization of company sections, the publication of company magazines or bulletins, or the various things which are being currently done by all of you. All these matters will help, but they lack that fundamental appeal which is so essential to success in salesmanship—they lack the appeal to the employees' own self-interest. Not until you have worked out some plan by which you can make such an appeal effective every hour of the day and every day in the year, can it be said that you have really and successfully sold the jobs to the men.

The day is not far distant when the managements of the electric railway industry in the country will grasp the possibilities of salesmanship as applied both to the employees and to the public. Their analysis will carry them sufficiently far to show that they must train all of their employees to be good salesmen. They will first have to sell the jobs to the men. They will develop some plan which will appeal to the employees' own self-interest.

At the risk of suggesting something impossible, it has flashed through my mind that you will work out a plan of compensation for motormen and conductors which will give the trainmen a participation in the increased earnings obtained by the company, say per car-mile, a participation in improved schedule speed, a participation in the saving of expenditures for personal injuries and damages, and a participation in the saving in power consumption for the operation of cars. If such a scheme as this can be developed, it will automatically give your motormen and conductors increased earning power when times are good. Conversely, when times are bad there will be a decrease through the lower earnings of the company.

In order to get the maximum benefit of such a plan, it will be necessary that the scheme be sold to the men. They must thoroughly understand it and appreciate that they are in business with the company, that their co-operation with the management in serving the public is essential to their own well-being, and that whenever they incur additional expense through either lack of attention or carelessness, they are paying a portion of such increased costs. After the jobs have been sold to the men and a fairly permanent organization of street railway service salesmen is developed, your industry will then be in position to go to the public and offer something for the increased fares or shorter hauls which you now feel the industry requires if it is to be maintained on a sound financial footing.

APPEAL MUST BE MADE TO SELF-INTEREST OF PUBLIC

Mere advertising that you are losing money is not going to give you higher fares or shorter hauls. You will have to develop some idea or principle in connection with your railway operation upon which can be made a sound appeal to the self-interest of the public. This may be along the lines of offering the public better service, more frequent operation of cars, more comfortable cars, faster service, more courteous motormen and conductors, more prompt settlements of accident claims, more comprehensive street railway systems or any one or more of the many other things, some tangible and others intangible, which go to determine in the minds of the public whether the car service is good, bad or indifferent.

Your legal department may be able to advise you respecting the law governing the right of the company to procure an increase in fares or a reduction in the length of haul. It may be able to present the economic facts upon which a regulating commission should improve your financial position. But your legal department, as such, will never be able to procure for you by argument the real goal to which you all aspire. This is a job for the salesman manager, supported by an organization trained in and appreciating the art of salesmanship.

MAKING EMPLOYEES SALESMEN

In regard to the previously mentioned point of making salesmen out of employees after their jobs have been sold to them, it may be explained that there is an increasing demand on the part of the public for a more personal service. In the eyes of the public, the conductor and the motorman are the company's representatives. If they are liked, the company is liked. If they are offensive, the company is offensive. Imagine a conductor saying "thank you" for a 5-cent fare, and yet what an asset such a man would be to his company, and to himself. If he were "sold" on the idea, he would be more inclined to regard his car as a coach instead of a "way freight," and the public would be less inclined to regard it as a flat-wheeled vehicle run by two "roughnecks." Never mind whose fault it is that both parties are misled—the fact remains that they both must be "unsold" on their wrong conceptions if you are ever going to get higher fares or shorter hauls. And it should be remembered that financial participation of some sort will go a long way to make your employees real intelligent sales representatives.

The inculcation of the worth-whileness of this personal-service idea will develop in the men more self-respect, more self-confidence. It can be made the stepping stone to an efficient salesmanship beyond your wildest dreams. There is just as great opportunity for good salesmanship between your operating men and the public as there is between a merchant and his customers. The principle is the same in both cases, only you, perhaps, have never thought of it in just that way.

SELLING WORK SHOULD NOT BE SPASMODIC

It should not be imagined, of course, that an electric railway selling campaign can be successfully carried out in a short time or in a hit-and-miss fashion. It is hard enough for big manufacturing concerns with the most complete distribution of goods and a big annual advertising appropriation to keep the public "sold" on their product and thus prevent a competitor from walking away with their trade. Nothing short of "eternal vigilance" is the price of such liberty. They do not let the public or the retail trade forget them for an instant. The wheels of salesmanship never cease revolving. National and local advertising, window trimming and store cards, sampling to the customer and incessant work with jobbers and retailers by salesmen specially trained not only to sell goods but the advertising policy of the house as well, are all means persistently used until at last the trademark or container becomes synonymous with the product itself and the advertising becomes institutionalized. And all this on behalf of a business the capital investment of which is a negligible quantity when compared to the amount of money tied up in your roads.

Sustained salesmanship pays. For example, if it were known in Philadelphia that to-morrow morning there would be a mob gathered in front of John Wanamaker's store in that city for the purpose of destroying it, you would find an infinitely larger number of people on the spot ready to protect and defend it. Forty years of consistent, truthful advertising has transferred the moral ownership of the Wanamaker store to the citizens of Philadelphia. It is their store as much as it is his. In other words, John Wanamaker has been steadily "selling" himself to the citizens of Philadelphia for nearly a half century. Can you imagine a competitor making any serious headway against him in that big town? If John Wanamaker were the active head of the Philadelphia electric railways, he would have done practically the same thing, because he is a good salesman.

SPEAK THE PUBLIC'S LANGUAGE AND SPEAK IT EARLY

Too many of our big industrial leaders have only grown peevish at bursts of public unfriendliness. They have charged the hostility to demagogues, to muckrakers. The cause lies much deeper than that. Industrial leaders have never appealed to the self-interest of their own employees or the public, neither of whom believe they are getting their money's worth. They are foreigners to the public—these great captains of industry. They speak another language or no language at all. When confronted by trouble or suspicion they fly into long interviews, which the public discounts, if it ever reads them. Or they employ a crafty press agent, whom the public spots, or they buy columns of newspaper space to explain, when it is too late.

After public suspicion gets in the saddle, it is too late to do anything except go and hide for years until the world forgets. The only sure way to enlist the public sympathy is by appealing to its self-interest, and the biggest corporation has to take the same thoroughfare to the public confidence that is used by the humblest merchant.

Leaders of men from time immemorial have built their leadership upon the interests of the men they led. Max Stirner, the great German individualist, expresses the idea in a nutshell: "Every idea, every system, every sacred cause, no matter how great, is outrivaled and modified by each man's personal interests." This is a truism which we all recognize. We know that man is interested in himself first, that his ills are larger than the remedy, that desire is always greater than satisfaction. Trust us to get "ours" in any proposition where a definite advantage is involved! And do you, therefore, blame your employees for taking a similar view? They have never been able to get "theirs" individually, and so they combine and "beat you to it."

The remedy is in your own hands. You must awaken your men to the fact that the job you offer is really worth while, and that they can play their own game most successfully by playing yours. When they are "sold" on the fact that such a plan works both ways, they will be your enthusiastic salesmen with the public. And the most significant development of the whole proceeding will be that you will have successfully "sold" yourselves on a plan which has already proved itself in the history of every successful advertiser in the United States.

The electric railways of the country constitute no exception to the rule. They must pay and pay well for the right men who will, in turn, render that "personal service" which will constitute a bond of sympathy between the railways and the public—a bond to which the railways can tie in the time of trouble. This is salesmanship in its most effective form, for it is the kind that will crystallize and bring to the surface a human sentiment in your behalf which shall be for your industry an indestructible asset.

A Co-operative Insurance and Pension System*

Features of Suggested System Are Its Encouragement of Thrift Among Employees and Its Incentive to Continuous Employment—Employers' Average Contribution Would Not Exceed 3 Per Cent of Wages—Old Established Insurance Company Should Carry the System

By EDWARD E. RICE
Boston, Mass.

THE term "social insurance," like the term "socialism," is open to wide variations as to meaning. To some it may signify a purely gratuitous state system administered by governmental agencies. To others it may denote a compulsory contributory system between employer, employee and state. Others may regard it as a program which must be worked out in the course of time along individualistic lines through a method of co-operation between employer and employee. The latter view is more in accord with the nature of our government and institutions, as well as the character of the people and the conditions under which they live. This interpretation offers to the employer a twofold opportunity: (1) To demonstrate that the benefits included under the term "social insurance" can be adequately provided by the employer as an adjunct to the wage contract; and (2) to prove to himself that the adoption of such a system will in great measure and in due time solve the employment and wage problems with their correlative issues.

For fourteen years E. E. Rice has specialized in the problems of the insurance business and of late has given particular attention to the development of plans for the wholesale insuring of employees of large corporations.

BUILDING FOR THE FUTURE

Under the present abnormal labor conditions, manufacturers feel impelled to pay any price for labor regardless of future conditions. This has an unfortunate effect on industries whose business has remained normal but is bound to become disorganized when the readjustment comes, as it surely must. This brings up the query as to whether the present era of prosperity is not the proper time to build plans which seek to conserve the present earnings of the employee for future use. While it is true that the average employee desires cash in hand in preference to future benefits, this does not justify the employer in granting his wishes, particularly when he knows that it may serve simply as a pretext for demands in future.

The opinion of the average workman is largely formed by others whose interests are counter to the interests of the employer. This influence can only be overcome by the education of the employee as to what really constitutes his own interest. As the cash nexus is to-day the strongest tie between the employer and the employee, the only way to build for the future is through an elaboration and extension of the wage principle. As an illustration, many employers are to-day offering liberal cash bonuses to their employees as a means of holding them to the employment. Others have adopted profit-sharing plans. Both have merit from the standpoint of present value. How much better would it be if, instead of the entire allowance being made in cash, part of it could be conserved and accumulated in a fund to provide future benefits for the persistent employee. It is admitted to-day that the working man does not as a rule provide for the future. He has been taught to spend every cent partly because in the past he may have been obliged to spend every cent, and when he secures an increase in wages, the amount which he can save seems so small that he does not take the trouble to save it.

WORKMEN CAN BE TAUGHT TO SAVE

But the working man can be taught to save. The experience of England to-day furnishes a splendid example of education in thrift. The working man and every member of his family have seized the opportunity presented by the government's small 5-per cent war certificates to save for the future. Prior to the war, the British working man saved nothing. He has now developed a real mania for saving, and why? Simply because the right method was discovered and the right argument applied. While it is true that in the United States to-day there are many open doors for saving, there has not been developed any widespread program of education in persistent saving, and the banking agencies have not as yet offered the right plan or method to induce the small saver to conserve his savings. Records show that only a very small percentage of accounts in banks are in the persistent class. The money is withdrawn and either spent or invested, and, in the latter case, quite often lost in "get-rich-quick" schemes. A form of certificate requiring weekly or monthly payments and convertible into full paid interest-bearing certificates would meet the needs of the situation.

The element of thrift is one of the most valuable features of a co-operative pension and insurance plan between employer and employee. There are many different agencies for thrift besides those included under a general insurance and pension system, and these plans can rightly be considered entirely separate from such a system, but any plan which induces employees to save money, and to continue to save not only while in the employment but thereafter, must be considered as part of a general thrift program. Every employer knows that the thrifty man is the better workman because he is steadier and less likely to jump over the traces to gain a temporary advantage elsewhere. The great advantage of a co-operative insurance and pension system lies in establishing a goal for the accumulation of savings, and also in giving the employee evidence from year to year of the progress he is making. To avoid any taint of paternalism, the employee should be taken into the confidence of the employer and shown the real reason for the employer's interest in the adoption of the plan. He should be made to realize that the employer is desirous of his services on a permanent basis, and that the contribution of the employer is one which is contingent on service; that it is not charity but reward for persistent effort.

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*Abstract of paper presented before the American Electric Railway Association at Boston, Mass., Feb. 16, 1917.

To make an insurance and pension system fully co-operative, all features should be placed before a committee of employees representing every department, and this committee should act as a working organization to bring the plan to the attention of fellow workmen and to make its details thoroughly understood. The first step naturally is the decision on the part of the corporation as to the plan and the amount of participation. The next step is the selection of a working committee among the employees. This committee may consist of the directors of the local mutual aid association, supplemented by representatives from each department of the industry. This committee would advise with the management as to the carrying out of the details of the plan. The next step is the drafting of a circular announcement furnishing full details of the plan, with card attached requesting the expression of opinion.

The work of the committee then commences in earnest. This consists of the explanation of the plan by open forum held in each section. After the meetings, each member of the committee will individually see the men in his department or section who have not already enrolled and secure their answers. In many industries it is not possible to make the plan compulsory, owing to certain labor conditions, but a non-compulsory plan through efficient work on the part of the committee can be made to include a larger percentage, sufficient to create a strong influence throughout the industry in favor of stability.

ACCIDENT AND HEALTH INSURANCE

The first provision should cover not only injuries received as a result of the employment, these injuries being now covered by the compensation acts in the various states, but also injuries outside of the employment and sickness of every kind and nature.

A form of group accident and health insurance now provides benefits for employees as follows: Coverage for twenty-six weeks, fifty-two weeks or longer periods providing indemnity for all injuries not included under compensation acts, and for all sickness at a definite price per $5 a week indemnity, or for a definite percentage of payroll equal to, say, one-half or two-thirds of the average compensation received by employees. A group contract covering such benefits may be issued to the corporation, giving the names of all employees covered, the amount of indemnity in each case and the insuring provisions. This contract is held by the employer. The employee receives an individual certificate stating his own particular coverage under the contract. All settlements of claims under such a contract are made through the corporation, and by the corporation handed over to the employee.

The cost of a benefit equal to two-thirds compensation under the above plan, not covering the first week's disability, providing indemnity for all accidents not now covered under the compensation act, and for sickness up to a limit of fifty-two weeks may vary, according to employment, from 1 per cent to 1¼ per cent of payroll. I recently received a quotation of 1.08 per cent to cover a medium grade manufacturing plant. This low cost would indicate that group accident and health insurance, on account of the low expense rate, may offer a solution for many industries of the problem of health insurance protection as an extension of the present compensation acts.

This form of coverage is also written by several companies under an individual form of policy, but at a blanket rate. The employee in this case receives an individual policy and has the right to continue the insurance after leaving the employment at the same low rate.

There is a substantial saving in cost of disability insurance under individual policies owing to the elimination of a considerable percentage of underwriting expense, especially the expense of procuring the business and of making the collections. A large, responsible insurance company, while making its rates on a basis to yield a profit, is also prepared to accept a loss and still continue to furnish insurance according to contract. In other words, the insurance feature is guaranteed without possibility of extra assessment. Furthermore, an insurance company possessing a nation-wide organization can carry out the continuation of insurance after termination of employment without any embarrassment in the handling of claims. Moreover, such a company is in a position to give first-class service in the handling of all details of administration. Adjustment of health claims requires experience and tact. An insurance company whose organization has been built up to give intelligent service is equipped to co-operate with employer and employee and to give satisfaction in settlement of claims.

LIFE INSURANCE

It is admitted that the working man in this country carries practically no life insurance outside of a mere burial benefit. The life insurance companies writing the industrial form of insurance do not pretend to cover the ground, and the average amount of insurance written by these companies per person is no more than a burial benefit. The prime reasons for the lack of adequate life insurance among working people are: (1) Its high cost, due principally to cost of procuring the business and cost of collection; (2) the fact that any method of individual solicitation reaches only a fraction of the working class; and (3) the general indisposition of the working class to look out for other than actual present-day needs.

Within the last five years, a new form of life insurance known as group life insurance has come into being. Under this plan employers may arrange to cover all of their employees or all employees of a certain class for a definite amount of life insurance under a group or blanket contract issued to the concern. In this case, as in the case of group accident and health insurance, the contract contains a list of the names of all employees covered, the amount of insurance in each case and the insuring provisions. These provisions include payment of the full amount of life insurance immediately in event of death of the employee while in the service, and also payment of the full proceeds in instalments yearly in case the employee becomes totally and permanently disabled from accident or disease prior to reaching the age of sixty. This form of insurance is designed to be paid for entirely by the employer, and, according to its terms, the insurance under the group plan terminates when the employee severs his connection with the concern.

Several companies offer a conversion feature in connection with group life insurance which permits the employee to convert insurance under the group policy to any individual life or endowment policy issued by the insurance company within a certain brief time, usually ten days, after terminating his employment. This feature may be adopted by the employer, since the employee in certain circumstances may well wish to avail himself of its advantages.

Group life insurance, on account of the fact that the rate increases with each individual as his age increases, does not lend itself so well on the co-operative or contributory plan. A prominent concern, however, provides for group life insurance on a contributory basis whereby the increase in the rate from year to year is assumed by the employer during the length of service. On leaving the service the employee is then obliged to pay the rate for his age.

As a further adjunct to this plan, this concern offers to refund to the employee, on reaching the age of sixty-five, all payments that he has made for group life insurance in the meantime. This provision is not a part of the policy contract offered by the insurance company, but is a guarantee of the employer.

Inasmuch as the inclusion of all employees or all employees of a certain class precludes the possibility of adverse selection of risks, this insurance is to-day written without medical examination. Furthermore, new employees may be included without medical examination according to the terms of the group contract. Each employee receives a separate individual certificate stating his particular coverage. This coverage may be a stated amount for all employees or may be a graded amount in accordance with length of service. A popular form furnishes employees of one year's standing with $500 of life insurance, with an increase of $100 for each additional year of service up to a maximum of $2,000 of life insurance per employee. Another plan makes the amount of insurance exactly equal to one year's or two years' compensation. The former plan, however, seems to be more popular and is more in accordance with the purpose of co-operative insurance plans, namely, to be an incentive to continuous service.

The rates for group insurance when issued on the non-participating plan vary in accordance with the risk of employment. The cost is based on the combined ages of all employees to be covered. The rate for a certain group, however, is not the rate for the average age of that group, for the reason that the rates naturally increase faster at the older ages than at the younger ages. The probable cost per $1,000 of life insurance varies from $8 to $12, depending upon the variation in ages and the character of the employment. The accompanying table shows individual rates simply by ages.

As to the advantages of group life insurance from the standpoint of the employer, these have been recognized by an increasing number of concerns throughout the country which have adopted this form of insurance. The principal advantage lies in the continuing benefit dependent upon the employment. The award of a cash bonus, equal to what the insurance cost would be to the employer, while perhaps appreciated by the employee at the time, would have no value from the standpoint of retention in service. The possession of a $1,000 life insurance certificate, however, particularly to the married man, not only has value to himself but is also appreciated by his wife and immediate family. The influence of the family can usually be counted upon when the question of change of employment comes up.

Other advantages which have been cited in connection with group insurance are as follows:

Stability of labor.
Reduction in the cost of overturn.
Solution of the transient problem.
Establishment of good shop spirit.
Attraction of good operatives.
A publicity value to the employer.
A philanthropic method of alleviating distress among employees and their families.

CONTRIBUTORY PENSION PROVISIONS

I have now come to the consideration of a plan which embraces the co-operative feature. Group life insurance, as previously stated, is a plan which works out more satisfactorily when the employer pays the entire premium. It was not designed primarily for joint participation. The plan which I shall outline here is one which combines life insurance with the accumulation of funds to provide a pension or life income commencing at the age of sixty-five, the cost to be provided for by joint contribution between employer and employee.

Many corporations now provide a non-contributory or gratuitous pension for long-service employees. This provision usually takes the form of a payment equal to a certain percentage of average salary earned during the ten years previous to retirement, the percentage being based on the number of years of continuous service. Some employers prefer to treat each case individually, having no definite established pension system. These private pension plans are undoubtedly most beneficial in their value to older employees. It is questionable, however, whether they actually accomplish anything from the standpoint of retention in service of the younger employees. The average young man does not look ahead as far as the age of sixty-five. If he thinks at all about it, he is likely to feel that he will probably not be in his present berth when he reaches that age. Most working men like a change in employment. Many of them also are suspicious of a purely gratuitous plan offered by the employer. They are likely to think that if they do not leave the service of their own accord, some reason will be found later for dispensing with their services before they reach the retirement age. Furthermore, inasmuch as the payment of pensions means an obligation extending for many years into the future, the argument of financial responsibility is one which should naturally be considered in the handling of a private pension system.

The joint contributory plan herein outlined meets these objections squarely by furnishing to each employee a contract by a responsible outside financial institution showing his cash accumulations from year to year and his increasing interest in the contract. He does not have to wait until he reaches the age of sixty-five in order to secure a benefit from the arrangement. He receives a benefit at all times proportionate to his years of service. Participation means appreciation on his part of the benefits which he receives, and when he makes payments periodically, he receives a constant reminder of the benefits which he is receiving to-day as well as the benefits which he will receive to-morrow, provided he persists. While in most employments it is probably not advisable to make a contributory plan compulsory, it is believed that provisions can be placed before the employees in such a manner that eventually the majority will become enrolled. One of the most essential, if not the most essential provision of any joint contributory plan should be the continuation feature, that is, the privilege given to the employee to continue the contract after termination of employment at the same rate in whatever new employment he enters. Any arrangement which will entail an increased premium after leaving the service is one which is sure to be frowned upon by the employees.

A large concern, which has adopted a profit-sharing system, is considering a plan which will offer each employee in the profit-sharing class an accumulative bonus equal to the same amount which the employee contributes, provided the employee contributes at least 50 per cent of the cash received from the profit-sharing account each year. The concern places the limit on a contribution of 5 per cent of the annual compensation received by the employee. After ten years, the employee owns full control of the proceeds of the contract, the funds being invested under a combination of life insurance and pension. If the employee terminates his employment before the expiration of ten years, the employer guarantees to return all deposits which the employee has made with 4 per cent interest, the employee having been insured in the meantime for amounts ranging from $500 to $3,000. Where the employee holds the contract under a definite agreement and can see the increase in his accumulation from year to year, there is offered a strong offset to outside influence.

A SPECIMEN PENSION CONTRACT

The following pension provision contract is offered by one of the larger insurance companies to-day:

1. A pension or life income commencing at the age of sixty-five from $100 per year up, with provision for payment of at least ten payments of $100 each in event of death before receiving that number of payments. In event the pensioner lives beyond ten years, the pension is continued for life.
2. Life insurance commencing at $500 from the start and increasing after the accumulation with interest exceeds $500 up to $1,083 at the age of sixty-five, the latter being the final cash value of the contract.
3. Non-forfeiture cash, loan and paid-up values for every year commencing with the second, these values being available under agreement between employer and employee.
4. Waiver of payments by both employer and employee in case the employee becomes totally and permanently disabled before reaching the age of sixty-five, the insurance in this case remaining in full force and the cash accumulations being also available for use.

The employer is to offer to contribute up to 5 per cent of the average compensation earned by the employee, as shown by the previous year's earnings—provided the employee subscribes an equal amount. The employee is to receive possession of the pension contract showing the cash values accumulating from year to year, and also is to receive an agreement from the employer relating to the application of the proceeds of the contract in event of termination of employment.

In event of termination of employment, two courses are open to the employee: (1) To receive the cash value of his part of the contract, or (2) to continue his part of the contract by payments direct to the insurance company. In event of termination of employment, three courses are open to the employer: (1) To give the employee full benefit of accumulations to date in consideration of his years of service; (2) to receive a refund of the employer's full share of his accumulation or (3) to receive a refund of his share of the accumulation less the part which the employee has earned through his years of service.

To illustrate the last, assume that an employer agrees to give the employee full ownership of the accumulations after ten years of service. In event the employee should leave before ten years, he would receive one-tenth of the employer's share of the accumulations for each year of service. This latter plan would entail a forfeit on the part of the employee of a definite amount of cash which might have certain value from the standpoint of retention in service. The employee would, of course, lose the contribution of the employer in the future under any plan in case of termination.

For the purpose of illustrating the amount of insurance and pension which definite contributions would purchase at various ages, assume an employee at the age of twenty, earning $600 per year, contributes 5 per cent. This amount, together with the employer's contribution, would purchase a life pension of approximately $500 per year commencing at the age of sixty-five, with life insurance of $2,500 from the start, increasing in the later years up to more than $5,000 at the age of sixty-five. An employee aged twenty-five earning $700 per year, on the basis of 5 per cent contribution by employer and himself would purchase a pension of approximately $480 per year commencing at the age of sixty-five, combined with life insurance of $2,400 at the start, increasing up to more than double this amount at the age of sixty-five. An employee aged thirty, earning $800 per year and contributing 5 per cent yearly, and the employer a like amount, would purchase a life income of approximately $450 per year, commencing at the age of sixty-five, with life insurance of $2,250 from the start, increasing up to more than double this amount at the age of sixty-five. An employee aged forty, earning $1,000 per year and contributing 5 per cent, would, with the employer's contribution, purchase a life income of $330 per year commencing at the age of sixty-five, combined with approximately $1,650 of life insurance from the start, increasing to more than double this amount at the age of sixty-five.

The contract, although providing for definite values at the age of sixty-five, permits the use of cash at any time prior to that age. It may occur that an employee through no fault of his own is thrown out of employment and needs the use of funds. It is possible for the employer to utilize the cash value of the contract in his behalf, arranging for payment at a later date in small installments. It is not believed advisable to utilize the cash value of the contract except in rare instances. Loss of time through disability and sickness should be provided for by a separate form of contract for the employee.

ESTIMATE OF COST

It is difficult to estimate in advance the exact cost of a pension or life insurance provision until the number participating is known and their compensation received. If the employee has the option of making his contribution from 1 per cent to 5 per cent of his wages and the employer contributes a like amount, the employer's contribution would depend upon the choice of the employee. It is probable that a considerable number of employees will enroll for the minimum amount. I believe as an estimate that the average contribution would not exceed 3 per cent of wages, and would more nearly approximate 2 per cent of wages. With an average wage of $700 per annum, this would mean a contribution of $14 to $21 per year per man. This, however, would be the outside cost, for if the employer should in accordance with the plan receive a refund in case of terminations of service within ten years, these refunds would reduce the cost considerably. According to the cash value of the contract within the first period of ten years, the employer would draw back, in case of terminations, anywhere from 10 per cent to 80 per cent of the total deposits made within ten years. On the assumption that probably most of the changes would be in the earlier years of the contract, as usually happens, the employer would draw back approximately one-half of his deposits in cases of termination, which would reduce the net cost in these cases by about 50 per cent. The reduction in the total cost would then depend upon the percentage of terminations within a period of ten years. This, of course, is largely guess work, but I believe that on a conservative basis the cost would probably be reduced at least 25 per cent through the refund provision.

Contribution Plan Used by Large Company

Other methods of contribution may be suggested, and the plan outlined below is one which has been adopted by a large concern employing between 5000 and 6000 men. Under this plan each employee who had been in the service for one year or more had the opportunity to subscribe to a pension combined with life insurance as follows:

$500 life insurance combined with $100 pension at the age of sixty-five.

$1,000 life insurance combined with $200 pension at the age of sixty-five.

$1,500 life insurance combined with $300 pension at the age of sixty-five.

Contributions of the employer were on the following basis:

From beginning of second year's service to end of fifth year's service, 10 per cent.

From beginning of sixth year's service to end of tenth year's service, 15 per cent.

From beginning of eleventh year's service to end of twentieth year's service, 20 per cent.

From beginning of twenty-first year's service to end of thirtieth year's service, 25 per cent.

More than thirty years' service, 30 per cent.

Under this plan the average amount contributed was not in excess of $5 per man per year, the contribution here being based on total payments required at various ages. This naturally offered the older man a larger contribution for the reason that the cost of a pension and life insurance combined naturally increases as the age increases. This feature, however, was regarded as desirable inasmuch as it permitted the older men to enter the plan and assist in providing for their own retirement. In connection with this plan, the corporation allowed the employee on leaving the service to carry with him the contract without any deductions on account of termination of service. This left no string on the proposition as a whole, and accounted for its ready acceptance by the employees.

Use of Established Insurance Companies

In advocating an old established insurance company as a carrier for contributory pension insurance, I wish to call attention to the following points:

1. Insurance and pensions call for the payment of funds years and years in the future, even up to forty and fifty years as a limit. This presupposes the existence of an institution large and strong enough to weather all storms and to guarantee the payments without question.
2. Private pension funds have, in many cases, proved disastrous by holding out more at the start than they can ultimately fulfill—the funds not having been based on actuarial practice.
3. A contract in a standard life insurance company has certain values in the eye of the employee not possessed by any other financial document. It represents to him an absolute guarantee entirely separate and distinct from the business under which he operates.
4. Continuation of the contract at the same rates after leaving the service is an important factor in any plan, and the organization of an insurance company lends itself most readily to the complete service of the employee at all times.
5. Life insurance is a necessary part of a complete system, and can best be offered by a standard old line life insurance company accustomed to the rating and acceptance of risks and to administration details.
6. The rates under pension forms of insurance are such as to provide a fair interest return with absolute guarantee of principal. While it is possible that a fund may be conducted showing higher interest returns, it is questionable whether this higher return is equal in actual value to the greater security, flexibility and practicability of a plan administered by an old established insurance institution. The contribution of the employer to the deposit is a better method than that of increasing the interest rate, for the employee has concrete evidence of the actual cash going to his credit from year to year.

Summary

The foregoing constitutes a general outline of a plan which may be varied in its details to suit the conditions of a particular employment. It is not necessary that all parts of the plan be placed in operation at any one time. In one employment it may be desirable to provide sick and accident benefits as a starting point. In another employment it may be desirable to supplement the sick benefits now provided through the local association by life insurance benefits, either paid for by the employees or paid for jointly by employer and employee.

The feature which appeals to most employers in the adoption of a contributory system to provide pensions in the encouragement to thrift which such a plan offers. The employee is made to do something which he would not otherwise do, and he has a continuous incentive to keep saving from year to year. It is, of course, difficult to estimate the exact return to the employer as regards long service, but I believe I am safe in saying that there is a return, and that return is much greater than would be possible under any system of pure cash payments from year to year.

The contribution of the employer need not be as high as 3 per cent or 5 per cent of the compensation of the employee. It need be only such an amount as is necessary to enlist the enrollment of a considerable portion of the employees. As previously stated, the entire plan is one which must be taken up in a co-operative spirit between employer and employee, through the appointment of a committee of representative employees from each department who will act as interpreters in placing the proposition squarely before the men.

GROUP INSURANCE RATES FOR $1,000 OF INSURANCE

Age	Annual Premium	Age	Annual Premium
15	$6.38	50	$13.51
16	6.41	51	14.56
17	6.45	52	15.72
18	6.49	53	16.95
19	6.53	54	18.23
20	6.56	55	19.62
21	6.61	56	21.14
22	6.64	57	22.77
23	6.68	58	24.63
24	6.73	59	26.73
25	6.76	60	29.17
26	6.81	61	31.96
27	6.84	62	35.11
28	6.88	63	38.60
29	6.90	64	42.44
30	6.92	65	46.63
31	6.95	66	51.17
32	6.98	67	56.06
33	7.03	68	61.30
34	7.09	69	67.12
35	7.16	70	72.30
36	7.25	71	78.24
37	7.37	72	84.64
38	7.51	73	91.63
39	7.68	74	99.20
40	7.89	75	107.46
41	8.15	76	116.31
42	8.47	77	126.09
43	8.89	78	136.56
44	9.38	79	147.85
45	9.92	80	160.19
46	10.50		
47	11.13		
48	11.82		
49	12.62		

The Human Side of Industry*

The Humanity Now Exhibited Generally in Individuals Must Become Characteristic of Groups If Industrial Problems Are to Be Solved

By JAMES O. FAGAN
Waverley, Mass.

A FEW months after my arrival in America in the year 1882, I found myself stationed at East Deerfield, Mass., as a telegraph operator on the old Fitchburg Railroad. As a mere youth I had been spending several years in South America and South Africa, for the most part amid very strenuous and savage surroundings. Consequently, at East Deerfield, for quite a while, my mind was too busy thinking about the humanities and inhumanities in life to care much about my physical occupation. I was then in search of the human side of our civilization, and I am sorry to say I found myself a little further away from it at East Deerfield than I had been in Africa among the Kaffirs, the Bushmen and the baboons. In those savage regions they didn't exactly warn you beforehand that they intended to shoot you at sight and throw your carcass to the vultures, but when I first struck the railroad business in America the officials who hired the freight brakemen, for example, were in the habit of asking the applicant for work three leading questions: First—How old are you? Second—Where do you live? Third—What shall we do with your remains? And remember, you must not blame the railroad officials for this state of affairs. As a matter of fact, neither the government nor the social conscience of the nation in those days cared a snap for the living railroad man and of course still less for his remains after an accident.

For a great many years I have been trying to figure out the relationship between my job and society, and I have come to the conclusion that the paramount interests of social order and social well-being demand that the problems of industry, economic and otherwise, be thought out and worked out, as much as possible, from the human and personal points of view. I spent ten of the best years of my life studying the conditions and the prospects on American railroads and the all-impending industrial problems with which the railroads (and the people of this country for that matter) were, and still are, surrounded. From time to time during that period I visited many railroad and industrial centers. Periodically, I worked in mills and I have lived in corporation boarding houses and in the slums of American cities where so many of the problems of society are festering. And after this educative experience, I want to say that industry in this country, both as it is to-day and as it is going to be after the war, calls for the very serious and practical attention of every thinking man.

There are many other ideas for the conservation of American industry and for its adjustment after the war besides the route to which I am going to call your attention. These other considerations are political, mechanical, economical, social and psychological. It is true these several points are factors in the game of American industry, but they are not the game itself. The game itself is preeminently a human game, and humanity and not politics or economics is to be the helmsman of its destinies. Humanity in America to-day has the biggest job on its hands in all its history. It is being called upon to humanize industrial relationships. Believe me, industrial peace is going to be the great big after-the-war problem in America. And neither politics nor the expansion of payrolls is going to bring about this much-desired result. If political influence and satisfactory payroll and working conditions were alone sufficient to germinate good-will you would have industrial harmony on your railroads to-day instead of a hornet's nest of political and industrial intrigue.

After the war, industry in Europe is going to be humanized and harmonized to the limit. From this point of view, and it is vital, industry in Europe will have industry in America beaten from the start. After the war, unless all signs fail, industry in America is going to be handicapped by the clashing of classes. Why not look this situation squarely in the face right now? I tell you, the people of this country to-day are living in a fool's paradise. They do not seem to hear the babel of sound in the world of industry. Antagonisms seem to be multiplying in the ratio of laws that are being put over by those who do not work on to those who do. In order to regulate industry authority in this country seems to be getting it into its head that it is necessary to clip the wings of enterprise, to tax surplus profits, surplus brains, surplus initiative, and surplus democracy. The people to-day are putting their trust in commissions. The commissions can stand it, but God help the employee, the employer, the manufacturer and the consumer when industry has time to take account of its stock under normal conditions, after the war. From a political point of view the biggest business in America to-day is the "canning" business. Political interference usually resolves itself into a bull fight, with industry as the bull, and where industry is not the bull it is the Jonah.

There is a way out of all this muddle, and democracy in America does not yet despair of its handiwork. A new, a healthier attitude of mind toward good business from one end of the country to the other is the one thing needful. The same kind of human policy that is being consistently promoted in so-called big business in this country transferred to the propaganda and policies of the state and federal authorities would introduce a new form of human relationship into American industry. As a matter of fact, the world to-day is splendidly disposed toward industrial workers of every description. Healthier and better conditions, expanding payrolls, permanency of employment, consideration for old age, everywhere you hear the same story, slowly but surely on the way. Consequently, a better feeling, closer and better relationship between employers and employees should be the new gospel of Industry. It is the all-important industrial issue of the times. All kinds of readjustments after the war will depend absolutely on this new human propaganda. To expect employers and employees to settle their differences in an atmosphere of sensationalism is all wrong. To expect them to do it in a political atmosphere is also all wrong. So it is actually up to the people all over the country to provide the atmosphere in which these adjustments of wages and conditions can be made, and this atmosphere must not be sensational or political but widely considerate, human and square. This is the only way out. It is the key to the problem of industrial unrest. It is the educative process that is absolutely necessary for the protection of the worker and for the conservation of American industry after the war. Its root is Humanity, its name is Good-will.

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*Abstract of paper read at mid-year meeting of American Electric Railway Association, Boston, Mass., Feb. 16, 1917.

Good-will in industry then toward industry is a business proposition. It is a three-cornered proposition. It is an attitude of the employer's mind, it is an attitude of the employee's mind, it is an attitude of the public mind throughout the length and breadth of the country. The situation admits of no compromise. This three-cornered proposition must work together or fall together. How are we headed, what kind of mental attitude toward industry are we putting into our jobs and into our politics? That is the great consideration.

So I consider it my business, my privilege, to say to this audience, to ask every audience that I am privileged to address: What is your philosophy of industry? What is your mental attitude toward your fellows, toward your business, toward your employees or toward your job? Have you a cheerful, a co-operative, a personal interest in your work, whatever it may happen to be? If so, I tell you, it is well with you and the society you represent. But if you do not have this co-operative spirit, this partnership idea, this human side, no other plans or economic arrangements on earth will keep industry in America from drifting on to the rocks. It is the human side of industry that has done so much to straighten out the safety situation on railroads, and it is the human side, the appeal to common sense, common interests and common humanity that must now save industry in America from the fate of social and political Europe. I repeat, a better feeling, closer and better relationships between employers and employees, this is the new gospel of industry.

In the next place, I want to give you just a few words of homespun philosophy. Amid all the turmoil of the world's discordant as well as its benevolent activity, I want to remind you that we are not running the universe. The universe is running us. The route from chaos to Christianity is a link in a mighty plan. It is for us to study the symptoms, the tendencies of universal progress, to get the main features of this plan into our heads and as best we can, to become a part of its grand, Christian spirit.

Now, if we will only take the trouble to let our minds dig down deep into the problems which society to-day is being called upon to work out, we shall find ourselves confronted with a great primal proposition or tendency, namely a God-given mission to widen the range and extend the operation of human brotherhood. This brotherhood side of our civilization is its enduring side as well as its primal feature. The brothers and the sisters of the races live forever in the hearts of the people. The names of Plimsoll, Shaftesbury, Florence Nightingale, Dorothy Dix, Phillips Brooks, David Livingstone and Abraham Lincoln are reminders of this great human fact.

We find this brotherhood tendency, I say, working itself out in every trunk line of American progress at the present day; in religion, in art, in education, in science, and most persistently and thoroughly, perhaps, in American industry. Industry in this country is now being humanized from cellar to garret. For every day that passes, work in the mills, in the shops and on the railroads is becoming safer, pleasanter, more healthful, more secure and more remunerative. Furthermore, never in the history of the world have individuals as human beings and neighbors been so kindly disposed towards each other in personal and social relationships, and yet, at the same time, never have the groups of these same individuals been so restless in their industrial relationships, and never, perhaps, has society been so menaced by different political and industrial problems. What is the reason for this seemingly inconsistent situation? Why is it that from the beginning of historical times your group, large or small, in its relationship to other groups has nearly always been savage? From the beginning, I say, your political groups fighting among themselves, as it were, have always been making trouble for society, and now your industrial groups are very busily playing the same game. In the past the human individuals in any given group have seldom been sufficiently numerous or plucky to dominate the group machinery. In Europe to-day the spirit of humanity and righteousness is engaged in a life and death grapple with group machinery. An industrial struggle of the same desperate nature is now under way in America. Happily, however, the eyes of the people are beginning to open to the real nature of the situation. In other words, there is a revolt to-day in this country against group savagery, regardless of its nature or interest. For example, a railroad brotherhood must demonstrate that it is an American brotherhood, and if the right to strike means the right to inflict suffering on millions of innocent people, the contempt of public opinion will very quickly crush that kind of railroad brotherhood. A railroad strike is a savage, inhuman, unpardonable proceeding. And the public feeling in regard to it at the present day points to the fact that the great brotherhood plan of the universe is slowly but surely working to the surface in America and before long it will come into its own.

In any movement for the spreading of good-will in the industrial world, the first thing necessary is to talk it up and work it up in our local interests as well as in the name of the national welfare. In many respects we live in a very queer old world, and for the most part progress has actually to be driven into people. As a rule we have to be pursued and persuaded, and cornered sometimes even, to serve our best interests.

Again, in order to propagate this good-will faith in American industry we need a lot of courage, the courage of our convictions. Industry to-day in this country has many enemies, the most harmful, perhaps, being legislators of the sensational type. Some of these men look upon an industry as a political experiment station. Industry baiting in America to-day is getting to be a sort of profession.

It seems to me that industry in America is fast lapsing into the condition in which its heart is all right, but its body is being battered to pieces by too much political attention of the football variety. So I commend to everybody the come-back and get-back spirit of that game.

In a word, industry in America needs to put on the whole armor of its administrative and operative humanity. Peace and good-will in industry, peace and good-will in society and in the home—this is the combination that cannot be divorced. Not a rainbow vision or a star dream, but a healthy Christian interest in the conservation of American industry by the human route. This is the good word to all the people in every land; it is the gospel of the Galilean sifted down through the centuries and focused in all its penetrating significance on American industry, on American civilization at the present day.

Proceedings of A. E. R. A. Mid-Year Meeting in Boston

Attention of the Delegates Was Taken Up by Social Relations Report and Papers on Wage Arbitration, Salesmanship as Applied to Electric Railway Operation, and Similar Topics—Association Indorsed Universal Military Service—Large Attendance at Banquet in Evening

THE feature of the program at the mid-year meeting of the American Electric Railway Association at the Copley-Plaza Hotel in Boston, Mass., on Feb. 16, was the report of the social relations committee, together with the written discussion thereon. Important and interesting papers, however, were presented on other and somewhat allied topics, such as wage arbitration and contracts, salesmanship and the human side of industry. Practically no floor discussion was carried on in spite of the large attendance, but it was believed that most members realized the importance to the industry of the work accomplished.

In his administration of the affairs of the American Electric Railway Association President L. S. Storrs is giving to the industry the benefit of his scientific training combined with extensive steam railroad and electric railway experience.

The meeting was opened at 10.30 a. m. with L. S. Storrs, president The Connecticut Company, New Haven, Conn., in the chair. The first order of business was the presentation of resolutions that had been approved by the executive committee. One of these, presented by W. Caryl Ely, New York, N. Y., past-president of the association, covered the sending of a telegram of support to President Wilson in the present critical period. This resolution, adopted by the delegates, resulted in the following message being dispatched to the White House by President Storrs:

"The American Electric Railway Association assembled in annual mid-winter conference in Boston presents respectful greetings. Its gathering in Washington two years ago was made memorable by the splendid address with which it was honored by you. Now in the midst of what may be a national crisis, and when responsibilities rest upon the President that are wellnigh crushing in their momentous character, the association tenders to you, the President of the United States, this expression of its confidence, and pledges its patriotic support of all measures which you may take in upholding the dignity and honor of our country, and the rights, property and persons of its citizens on land and sea."

The other resolution, read by Secretary Burritt and likewise adopted, pledged the association to the principle of universal military training and service in the following words:

"Whereas, The future peace and prosperity of the United States depend upon its ability to defend its rights and its shores against invasion, and

"Whereas, Two years of war overseas have shown to us the need of a citizenry trained to arms, and

"Whereas, Our own history has demonstrated the folly of depending for defense upon raw or untrained troops, therefore, in the interest of public safety and for the protection of our homes, be it

"Resolved, That it is the sense of this meeting that legislation should be immediately enacted providing for universal military training and service, thereby placing the burden of defense equally upon all men of military age regardless of their social stations, which is in accordance with the true principles of democracy."

The report of the committee on social relations was presented by its chairman, James D. Mortimer, president North American Company, New York, N. Y. The two sections of the report on old age pensions and minimum wages are abstracted elsewhere in this issue, while the one on employees' thrift, which was presented in tentative form only, will not be published until it has been put in final form by the committee.

In general, however, it may now be said that the section on thrift summarized data from government and other sources showing the relative expenditures of employees for various necessities, and outlined the general principles seeming to underlie the disposition of wages. The report also described in detail the various means that have been used to promote thrift, such as industrial insurance, savings banks, building and loan associations, the postal savings system and the Morris Plan banks. The report then developed a method for ascertaining the tendency in thrift, finding this to have increased, but only in the case of the one-quarter of the workers who earn more than a living wage. There is nothing absolute, it was said, about the relationship between a fair wage and thrift, for thrift is simply a habit of the mind. Yet as a general proposition it seems that the benefits of thrift will not be secured until the financial surplus possessed by the workers is increased by means of some productivity basis for wages.

President Storrs congratulated the association upon having a committee willing to give time for such a serious study as the whole report involved, and then a written discussion on the report was read by E. E. Rice, Boston, Mass. This is presented elsewhere in abstract form. Theodore F. Green, trustee Rhode Island Company, Providence, R. I., amplified previous references to the Morris Plan banks by stating that these sell installment investment certificates as well as lend on credit and approved indorsers. In view of the work of these banks in restricting loan shark frauds, the investment feature has not been emphasized, but it exists.

Matthew C. Brush, president Boston Elevated Railway, and P. F. Sullivan, Bay State Street Railway, welcomed the delegates to the city and placed the local properties at their service. The scheduled paper on "Wage Arbitration and Contracts," prepared by Bentley W. Warren, Boston, Mass., was then read by W. F. Ham, vice-president Washington Railway & Electric Company, Washington, D. C. One query raised by this paper was as to whether or not the time has come for the enlarging of the jurisdiction of the public service commission to include the adjustment of wages and working conditions of employees.

Mr. Warren traced the development of the principle of control of utilities by bodies created by the state legislatures, and showed how it had resulted in the application of many restrictions to these properties. While the utilities had thus been restricted, they were criticised for not making suitable provisions for depreciation. The regulative bodies, at the same time, paid little attention to such matters as the expenses of the business and the control and reduction of these, as well as the relations of the carriers to their employees. They considered the quality of the service and the public safety, but not the cost of the service. Attention might well be given to labor matters, so that the carriers could get the best possible employees at the minimum permissible wages. On account of the public interest in this field, there are greater difficulties in regulating wages than in other industries.

In general, Mr. Warren said, the public approves collective bargaining and efforts to improve conditions of employment, but takes no part in these matters. In time, however, it must pay the increased cost. The system of contracts has been developed to meet present conditions, but with only two bargaining parties, both at a disadvantage. One wants to get more, the other to keep costs down. Obviously contracts should insure consideration for all of the three parties concerned. In early days the employer had the advantage in making contracts, but under present conditions the reverse is true. At present, the concessions made by employers in some contracts interfere with discipline.

Mr. Warren did not claim that wages are too high, but merely that the rate of fare is not only relatively but is absolutely lower than it was, measured in terms of service. He also urged that contracts should prohibit strikes, which are still brought on sometimes through infractions of discipline. Both parties agree to the difficulties of drawing suitable contracts, but have not found a way to gain the assistance of the public. Arbitration is usually resorted to, but is not a complete solution. There are difficulties in the selection of points to be arbitrated and later in instructing the third arbitrator, who is often unfamiliar with the technique of the business. The findings are not binding on the regulating bodies, and where the wages are raised the companies must pay without the right to increase the rate of fare. The natural tribunal for wage adjustment seems to be the public service commission, which is qualified to pass upon the points involved as it is familiar with the operating details of the companies. Its decision regarding discipline would be accepted by the carriers.

After Mr. Warren's paper a recess was declared until 2.30 p. m. Then the delegates listened to a paper on "The Human Side of Industry," by James O. Fagan, Waverley, Mass., and one on "Salesmanship in the Electric Railway Business," by Robert Frothingham, New York, N. Y. These are abstracted elsewhere. Without discussion the delegates then adjourned until the reception and banquet in the evening.

A. E. R. A. Executive Committee Meeting

Col. T. S. Williams Resigns as Vice-President at the Meeting in Boston—Report on Co-operation with War Department

THE American Association executive committee met at the Copley-Plaza Hotel on Feb. 15, and transacted the following business:

After the approval of a number of applications, reinstatements and resignations the secretary reported that there are now in good standing 356 railway company members, 213 manufacturing company members, 1289 individual members and 1732 company section members.

Among other items of interest the secretary stated that the proceedings of the 1916 meeting are practically ready for distribution, that a special committee on protection at grade crossings has been appointed, that there have been 100 requests for data on sixty subjects which have been supplied by the information bureau, that sixteen publications of miscellaneous character have been issued, and that the association is now represented in Washington by S. S. Perry.

An estimated budget of expenses and receipts was presented by the secretary and appropriations to the affiliated associations were approved as follows: Accountants' Association, $1,500; Engineering Association, $4,500; Claims Association, $1,200; Transportation & Traffic Association, $3,000.

General George H. Harries explained the plan and purpose of the committee on co-operation with the War Department, the name of which was changed to "committee on national defense." A resolution was adopted for reference to the association at the mid-year meeting, pledging support to the government. A resolution was also discussed and adopted preparatory to presentation at the meeting, favoring universal military service.

Progress reports were received from the committees on federal relations, valuation and compensation for carrying United States mail. It was also decided to appoint a special committee on co-operation in the use of special libraries. A suggestion received from J. K. Choate, looking toward a plan for securing a general increase in rates of fare, was referred for consideration to the appropriate committee. Other routine business included authorizing the president to appoint the usual convention committees and empowering the convention location committee to select the convention city. A report of the sub-committee on relationship of manufacturing companies to the association was received, discussed and referred back to the sub-committee for further consideration.

The resignation of Col. T. S. Williams as vice-president of the association was received and accepted with great regret. In explaining the necessity for this action Colonel Williams states as follows: "I understand that it is customary for the association to promote its first vice-president to the presidency. The president and other members of the executive committee have known for some time I could not consider assuming the duties of president even if the association should do me the great honor to promote me to that office, and with this in mind I preferred not to be elected first vice-president at the last annual meeting. I was prevailed upon, however, to accept this office with the understanding that I would resign during the present year. Inasmuch as the mid-year convention presents an opportune time for this resignation, I therefore resign as first vice-president, effective Feb. 15, 1917, so that my successor may be chosen at the time of that meeting."

In attendance at the executive committee were: L. S. Storrs, Richard McCulloch, J. H. Pardee, R. E. MacDougall, J. J. Stanley, George H. Harries, M. R. Boylan, C. L. Henry, W. Caryl Ely, Thomas Finigan, H. C. Donecker, E. B. Burritt.

To fill the vacancy created by the resignation of Colonel Williams each of the other three vice-presidents of the American Association were advanced ad interim in order, and Matthew C. Brush, president Boston Elevated Railway was appointed fourth vice-president ad interim.

Mid-Year Meeting Banquet

Patriotism the Keynote of Several Speeches—President Wilson Replies to Message Pledging Support That Was Sent by the Association During the Convention

ABOUT 600 members and guests attended the annual banquet at the Copley-Plaza Hotel on Feb. 16. Chairman M. C. Brush presided before and during the dinner, before the serving of which an impressive flag-raising ceremony was held. In one corner of the hall a tall pole had been erected with the base banked in palms. Through the hall, which was darkened save for spotlights thrown upon them, two marines, two sailors and two coast artillerymen marched to the foot of the pole. At a bugle signal they raised the flag and the audience sang the national anthem. The dinner was interspersed with unusually hearty singing, in stimulating which Chairman Brush had the assistance of an excellent male quartet. Afterward the quartet sang the "Toreador Song" from Carmen, "The Rosary" and the quartet from "Rigoletto." Mr. Brush then turned the meeting over to President L. S. Storrs, who in assuming his duties as toastmaster referred to the fact that it had been twenty-one years since the association had met in Boston.

The first speaker was Lieutenant-Governor Calvin Coolidge who brought a message of welcome from the governor and on his own behalf emphasized the need for sound and rational methods of control of public utilities. Quoting an early writer on the subject of electric railway transportation he referred humorously to the large profits formerly possible in this business while at the same time the utility was promoting the public welfare. He thought there was a need to get back to first principles along these lines.

James M. Curley, mayor of Boston, the next speaker, congratulated the association that it had elected Matthew C. Brush a vice-president of the organization. Mr. Brush, he said, recognized the trend of the times and the necessity for publicity in corporation affairs. The speaker believed that the public did not realize that the expenses of railway operation and taxes had increased while fares remained as they were twenty years ago. The report of the commission to investigate the Boston Elevated situation had been of great help in clearing up the matter. In conclusion, Mayor Curley said that if other electric railway companies followed the practice of the Boston Elevated in taking the public into their confidence they would do well.

The third speaker was Martin W. Littleton of New York whose address was of a highly patriotic nature, with the ideals of democracy as the basis. He said that the men who are advocating preparedness will pray for peace with those who expect peace on the condition that the latter help in preparing for war. "We will thank God for peace if it comes, but they will thank us for preparedness if war comes." Mr. Littleton emphasized that we are called upon to defend the ideals on which our constitution is based, the individualistic rights of our citizens. Among these is the right to possess property which is the material sign of liberty. In this country the Supreme Court stands between the people and the government to prevent the transgression of the rights of the individual, in marked contrast to the condition in Germany. He closed by expressing the belief that in the defense of its ideals this country is safe.

After Mr. Littleton's address President Storrs outlined briefly the efforts which had been made by the committee on co-operation with the War Department under the direction of Gen. George H. Harries. This is explained in detail elsewhere in this issue in the reports of the executive committee meeting and the general meeting. Mr. Storrs read the following telegram received from President Wilson in response to one sent him earlier in the day:

Washington, D. C., Feb. 16, 1917.

"L. S. STORRS, President American Electric Railway Association, Boston, Mass.

"Please present to the members of the American Electric Railway Association my very warm and grateful thanks for the message of confidence and support they have been gracious enough to send me and convey to them my warmest and most cordial greetings. Messages such as theirs make the task easier to carry.

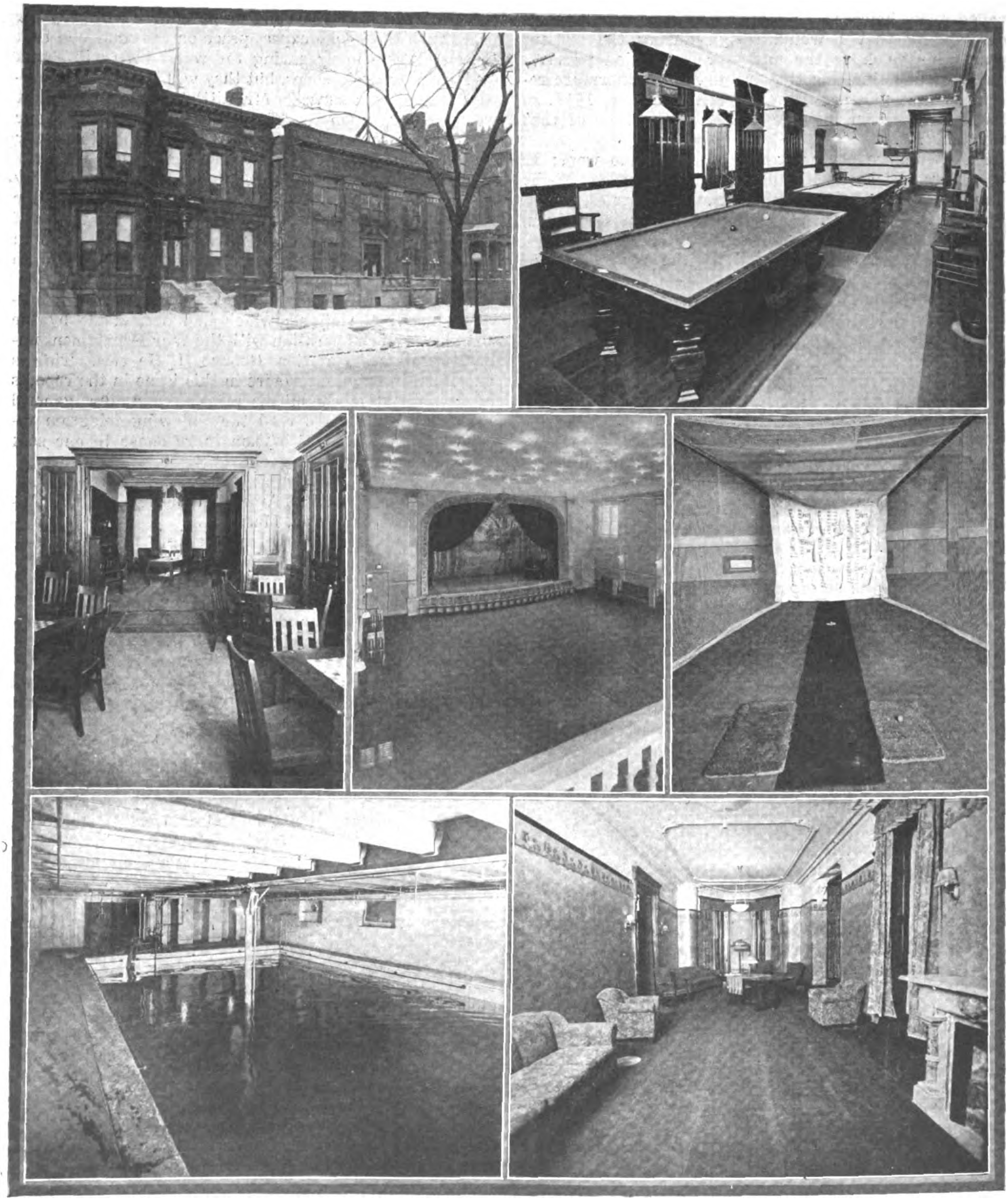
"WOODROW WILSON."

The final address was by Job E. Hedges of New York. Mr. Hedges referred to the day as being about midway between the birthdays of Lincoln and Washington and said that the great lesson to be derived from their lives was that they believed they had a mission to protect that for which this government stood. Mr. Hedges spoke about the condition of foreign affairs and also the present steam railroad situation and said we must protect ourselves against both foreign attack and indifference at home. His speech contained many epigrams. A typical one, relating to the present situation was: "It is a great thing to have the mind and spine synchronize."

The banquet closed with "America," sung by those present.

Handling Passengers at Stations

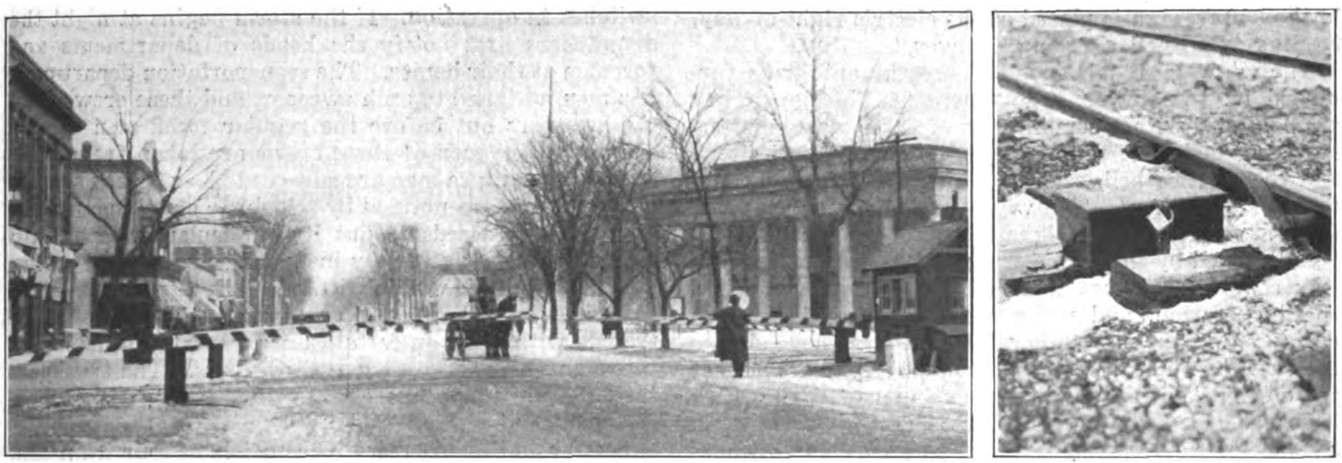
A report on a proposed rapid-transit plan for Sydney, Australia, made after extended studies of rapid-transit operations in cities of the United States and Europe, contains a chapter on the subject of passenger movement. In this the conclusion is drawn that elevators, as a means of handling dense railway passenger traffic to and from stations, are out of date. They have been superseded by moving stairways, which, when 4 ft. wide, are capable of handling 10,800 passengers per hour. Passages and ramps can accommodate thirty-five to forty persons per minute per foot of width, and stairways can accommodate thirty persons upward and eighteen persons downward per minute per foot of width. Entrances to stations can be less in width than the exits because passengers arrive at a station intermittently, while they are unloaded in great numbers. With regard to station design, the report states that a dead-end station (unless of a special design, which is not always possible on account of the expense) reduces the train capacity of a railway by about 20 per cent. Modern terminal stations are being constructed where possible with loops and such stations have the same train capacity as the railway.



Chicago Surface Lines New Clubhouse

The employees of the Chicago Surface Lines are enthusiastic over their new clubhouse which was opened last month. The illustrations show the external appearance of the building, the pool and billiard room, the chess and checkers room with adjoining library, the auditorium, which has a seating capacity of 600, a large stage and an excellent floor for dancing, the indoor golf course, the swimming pool and the attractively and comfortably furnished lounging room. The building was described in the ELECTRIC RAILWAY JOURNAL of Feb. 3, 1917, page 202, in the account of the opening reception. The membership of the club includes a women's auxiliary of eighty members, and it is planned to reserve the swimming pool and bowling alleys for the ladies one evening a week.

The Chicago Surface Lines Club is only two years old, but it has done much in fostering the feeling of good fellowship and common interest among the employees. The activities will probably be extended later to include educational features, and it may eventually become a section of the American Electric Railway Association.



NORTH SHORE GRADE-CROSSING PROTECTION—CROSSING GATES PAINTED IN STRIPES TO ARREST ATTENTION; CONTACT DEVICE FOR WIG-WAG CROSSING SIGNALS

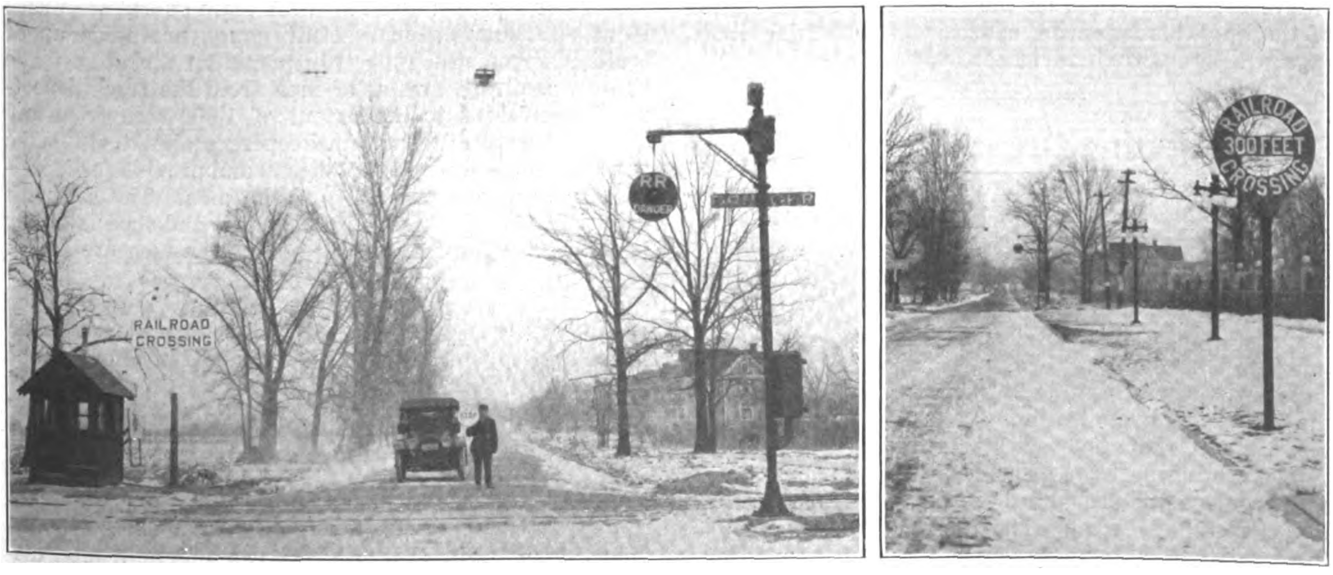
Eliminating Crossing Accidents

The Chicago, North Shore & Milwaukee Railroad Has Invested Over $20,000 in Wigwag Signals and Gates to Protect Grade Crossings on Thirty-three Miles of Line

PRACTICALLY the first official act of Britton I. Budd when he became president of the Chicago, North Shore & Milwaukee Railroad was to instruct the chief engineer, B. J. Fallon, to protect the crossings along the north shore so that the safety of pedestrians and vehicles might be assured. The Illinois Utilities Commission had previously ordered the former management to protect certain crossings, but after study of the conditions, Mr. Fallon installed protection not only on the crossings specified by the commission, but also for every crossing from the Evanston terminus to Waukegan, a distance of 25 miles, and included also in the work the 8-mile branch line to Libertyville. The south end of the North Shore line passes through the rather thickly-populated suburban residence section of Chicago, and the crossings are therefore numerous and the traffic over them is quite heavy. This condition, together with headways of fifteen minutes and less, in both directions on the double-track line, warranted special protection for every crossing from an economic as well as humanitarian consideration.

In this 25 miles of route there are forty-eight grade crossings and six overhead crossings. Protection has been given by automatic flags at twenty-five crossings, by crossing gates at fifteen, by electric bells at three and by flagmen at five. Four auto-flags are installed also on the Libertyville branch. The flagmen are used at crossings where the village authorities would not allow gates or auto-flags. In one location the residents objected to the crossing bell, and rather than lose this much of the safeguard, the company replaced it by a flagman. These flagmen use the white enameled disk on which the word "stop" is boldly painted as a more effective means of stopping a vehicle than the old-time cloth flag, which has been misinterpreted on some occasions.

Another feature of the safety measures in addition to the flags and crossing bells is the placing of warning signs either side of the right-of-way at all crossings except those equipped with gates. On the east side, and 300 ft. from the track, a large round iron sign painted red, with the printing cast in raised letters and silvered to reflect the light from automobile headlights, is mounted on a steel post set in concrete and reads "Railroad Crossing 300 Ft." The right-of-way is paralleled on the west side by the Chicago & North Western Railway, with only a narrow strip between these tracks and those of the electric line. In order to give added warning to traffic approaching the electric right-of-way from across the steam tracks, a round warning sign similar



NORTH SHORE GRADE-CROSSING PROTECTION—AUTOMATIC WIG-WAG SIGNAL AND SIGN INSTALLED AT CROSSING AND WARNING SIGNAL INSTALLED 300 FT. AWAY to the 300-ft. sign is placed at the electric right-of-way, reading "Railroad Crossing, Danger."

The wigwag signals installed are the auto-flags furnished by the Bryant Zinc Company, Chicago. They are equipped with a combination of three warnings, the swinging disk, the red light in the center of the disk and the electric bell, each of which operates independently of the others. The wigwag is motor driven by a 600-volt motor and the signal is controlled from a track box designed by the engineering department of the railway company. These track boxes are built for high-speed operation, and while a few failures have been registered in snowy weather, these failures have always been on the side of safety—that is, the signal was not cut off and kept on operating continuously. The track boxes are located to give a thirty-second warning in advance of the cars, and this has governed the installation from 2400 ft. from the crossing, where the speed is 60 m.p.h., to 1400 ft., where the trains approach slowly. An indication lamp is placed 200 ft. from the starting box which tells the motorman the wigwag is working. There is also a green lens on each side of the wigwag light cylinder which serves the same purpose.

All signals are set in concrete and the posts painted black and the disk red. The crossing gates are set on creosoted wood posts and painted red and white in alternate stripes.

Other work done in the general move to eliminate the crossing accidents included the clearing away of shrubbery and weeds, trimming of trees, moving of stations in a few instances and generally cleaning up a triangular space each way from the crossing of all obstructions to the clear view of the motorman or the driver of a crossing vehicle. In some instances this clean-up program met with great opposition, but generally by telling the owners the purposes of the move, it was possible to gain their permission to pull up good shrubbery. The crossing planks were rebuilt in many instances and filled in with crushed stone and planks laid the full width of the road, instead of the customary one set in the middle, to eliminate the possibility of an automobile becoming stalled on account of the irregularity in the roadbed at the crossing.

The maintenance on the various crossing protection devices and the labor charge for twenty-four-hour flagman service on this 33-mile southern section of the Milwaukee line adds about $35,000 a year to the operating expenses of the company. With the installation, during the coming spring, of twelve more gates and twelve more auto-flags on the remaining north section of the line, this operating expense for protecting crossings will be approximately $45,000 annually.

Snow-Fighting Organization in Denver

System Developed to Cope with Heavy Snowfalls—Whole Personnel of Tramway Can Be Used if Necessary

IN common with other railways operating in climates in which heavy snowfalls are frequent, the Denver Tramway has developed schemes for preventing interruption to traffic based upon immediate action coincident with the beginning of a storm. On this property the first action taken depends upon prevailing conditions, viz., time of year, hour with reference to peak load of traffic, condition of the ground, quality of snow, accompanying wind and probable duration of storm as reported by the Weather Bureau. The different departments plan their activities after considering the above conditions.

In the event of an ordinary snowstorm in mid-winter, men of the track department first clean and salt all switches in operation. If the storm begins at night the dispatchers first notify the heads of departments and foremen at their homes. The transportation department has men assigned to each sweeper, and these crews take the sweepers out before the regular track men can be called. If the men of these crews are taken from their regular runs extra men are substituted, or if they are not working they are notified by telephone or by messenger. Each crew proceeds to put its particular sweeper into good working condition by inspecting brooms and seeing that machinery is well lubricated. The dispatcher, being informed by the several car crews or inspectors as to trouble with snow on certain lines, reports to the superintendent, who orders out the sweepers. The transportation department has charge of the operation of all sweepers and plows.

A crew and relief crew each consists of four trainmen. The shops send a man to assist with large plows and to observe their action under working conditions. The dispatcher orders sweepers to follow regular routes, according to one of several predetermined plans which are designated by letters. Plan A outlines the routes of four sweepers for cleaning up the paved streets in the four main divisions of the city. Plan B directs the work of six sweepers sent out to clean up the entire system. Plan C specifies the routes in all sections of the city for all sweepers and plows owned by the company when ordered out during a more severe storm. Plan D is resorted to as the lines cease operating and a partial or complete tie-up seems unavoidable. It urges concentration of the equipment on one line which serves a large portion of the traveling public and gives access to the shops. In this circumstance continuous operation is not attempted, and cars are taken in so as not to hinder the snow-fighting equipment. Plan E, used in conjunction with plan C, gives a schedule of routing plow-cars for "winging" out snow after a heavy storm, each plow to be followed by a sweeper and a car with men from the track department to clean switches. Plan F gives the route and names of men in the crew and relief crew for each sweeper and plow.

Whenever operation is suspended due to an extra heavy fall of snow, six main arteries are opened first to give a basis of operation and to provide partial service for each portion of the city until the situation can be further relieved. The snow-fighting organization then consists of fourteen gangs, each following a predetermined schedule and composed of foreman, sub-foreman, timekeeper, waterboy, 100 laborers, sweeper and four-motor car for men and tools. A team and plow is used if at all advantageous. Four gangs are made up of trainmen from the four transportation divisions, while those remaining consist of men from the track department reinforced to the extent of 1,000 men from any available source. The timekeepers assign tools, make out daily payroll proration sheets, and provide for identification and transportation of the men. The car with each gang affords a portable shelter, and food is either provided for the men on the job or the men are fed at restaurants.

All work is directed by the planning bureau, which co-operates with the foremen, employment bureau and purchasing agent. It sees that the routes named in the plans mentioned above are followed as closely as practicable and attends to the deliveries of salt and car sand and the distribution of equipment, tools and men.

For the three years ended Dec. 31, 1916, the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, carried 147,040,186 passengers, a total distance of 22,415,077 miles, without a death or fatal injury in transit.

Companies' Attitude on Strike Restriction

New York Lines Doubt Effectiveness of Commission Plan for Providing Fair Wages and Preventing Service Interruption

IN connection with a general account of hearings before the Public Service Commission for the First District of New York on its tentative strike restriction plan for electric railways in New York City, the ELECTRIC RAILWAY JOURNAL of Feb. 10 mentioned in brief the objections raised by railway representatives at a meeting on Feb. 8. Before noting in this issue the comments of other representatives at later hearings, it will undoubtedly be of interest to describe in more detail the attitude of the railways in New York toward the commission plan, the text of which was published in the issue of Jan. 27.

MR. MAHER'S STATEMENT

The only official of the leading city companies who was able to attend the hearing was E. A. Maher, Sr., president Third Avenue Railway. Mr. Maher's opinion of the proposed plan was expressed in a previously prepared statement which was in part as follows:

"Any interference with service in the nature of a strike must necessarily cause all three of the parties involved, the public, the employer and the employee, to suffer, so that it is practically needless for us to say that we are interested in any legislation that will remove the possibility of, or make less likely the occurrence of, a strike. We are heartily in favor of some method of collective bargaining between the employees and the corporation. We do not believe, however, that any method which necessitates bringing into the situation, interests and individuals outside of the regular body of employees would result satisfactorily. The dealings should be directly between the men and the company, and no interests outside of the men, the company and the public should be permitted to intervene.

"We have within our organization a Mutual Benefit Association, in which practically 100 per cent of our employees are members. We also have a plan of life and accident insurance system which covers practically 80 per cent of our employees. We also have a pension system which applies to all of the employees. It is our present purpose to broaden the scope of our mutual benefit association, so that its members in the various divisions of the company will elect their own representatives to take up with the management any question affecting wages and working conditions and looking to the improvement of the service and the satisfaction of the demands of the public and of the employees. We believe that such an organization within the company, properly administered, would practically eliminate strikes and internal dissension between the men and the company. We are firmly convinced that any plan which left to any bodies outside of the organization the question of adjustment of differences, would not successfully work out.

"We are in favor of employees entering into contractual relations with the company, and the contract should specifically set forth the terms of employment and of working conditions. We believe such contract should be for a stated period of time, that necessarily it should be binding upon both parties thereto, and that there should be a proper penalty enforceable for the violation by either of the parties. All questions of discipline and efficiency should rest entirely with the employer. The employee should have every opportunity of presenting a full and complete defense to any charge that may be filed against him and to have a fair hearing and a just decision. This could be done within the organization itself and without the intervention of outside parties, for it is needless to say that no corporation wants to dispense with the services of a competent, capable employee, so long as there is room for his employment in the services. We believe that the experience of the Philadelphia Rapid Transit Company with its employees, extending over a period of more than five years, conclusively demonstrates the possibility of settling all differences that may arise between employer and employee in a public service corporation, in a manner that is entirely satisfactory to the public, the employer and the employee."

COLONEL WILLIAMS' STATEMENT

T. S. Williams, president Brooklyn Rapid Transit Company, and T. P. Shonts, president Interborough Rapid Transit Company and New York Railways, were both unable to be present at the hearing but sent written communications giving their views. Mr. Williams said that he appreciated the motive of the commission in seeking to prevent interruption of service by reason of dissatisfaction with wages and working conditions, but he did not agree that the ends aimed at could best be accomplished by law or that such legislation as proposed would be either practicable or beneficial. On the other hand, he feared that it would be productive of unrest and dissatisfaction, tending to disturb relations which are now harmonious and fairly satisfactory.

Continuing, Mr. Williams said in part:

"If there were substantial reasons for expecting that your plan would preserve continuity of service in case of labor disputes, we would all, I think, be disposed to waive minor differences of opinion. But it seems to have been conceded that at best the proposed legislation could only serve as a moral argument against strikes, and that there would be no way of enforcing among workers observance of a labor decision, although the power of the commission over railroad corporations could be exercised to compel obedience from the corporations. This admission, it seems to me, puts us no farther forward than we are to-day, and if continuity of service cannot be secured with reasonable certainty from the plan, its other features would probably not be seriously put forth and are in their general scope too radical and objectionable to warrant favorable consideration.

"My own conviction is very strong that such problems must be solved not by law but by intelligent and fair co-operation. No legislative reforms are likely to be so abortive as those which have to do with the delicate relations between labor and capital, and which on the one side may threaten fundamental principles of individual freedom, and on the other side imperil or unnecessarily shackle business and industry. The better and surer way to correct industrial evils is by encouraging a more enlightened comprehension of respective self-interest between employed and employers. At no time in the world's history has the necessity for this mutual sympathy and co-operation been so generally recognized as it is to-day. Inequalities and adverse conditions exist, and perhaps always will, but the force and power of an educated public sentiment, finding sympathetic and practical response both from those who toil and from those who invest, will have more influence in securing substantial equity than any law—and such a response will be the most effective insurance to the public against the evils in interruptions of transportation and industry which follow misunderstandings and discord.

"Every reasonable investor knows that his investment in a public service corporation cannot be on a sound and permanently productive basis unless the workers, whom his money hires, and the public, which his facilities serve, are reasonably satisfied. Every sensible employee likewise knows that the permanence, conditions and emoluments of his employment depend primarily upon the continuance of investment and upon satisfaction with its return. And the public knows that its comfort and convenience are best subserved when both investor and worker are reasonably satisfied with their respective participation in the products of their joint undertaking. General recognition of this common interest may be slow in coming, and in the meanwhile there may be regretful clashes, but if the principle is sound it will ultimately be triumphant.

"Your plan, on the other hand, presupposes not natural and spontaneous harmony between these participants, but antagonism and the doubtful peace sought to be inforced by law or official fiat. The other plan assumes mutual interest, presupposes honest purpose and encourages intelligent co-operation. From neither plan would its advocate expect that a Utopia could be developed at once. Your plan may look like the short route to industrial peace, but it is not the natural or safe or permanent route, nor is it founded on a sound principle. In its practical application it would tend to breed trouble, not to allay it.

"The principles outlined above have been put into practical effect on the Brooklyn Rapid Transit System. They received a severe test in the surrounding labor disturbances of last summer, and they stood that test well. Had the plan which you now recommend been then in force we would probably have had dissatisfaction and disturbance. Instead there was mutual confidence, loyalty to the enterprise, enthusiastic co-operation and, of course, no interruption to service. We have a splendid body of men who are trying in their own way, and, I think, the right way, to solve these difficult problems, and we ask that they be left alone to solve them in that way as long as it is satisfactory to them and insures public comfort."

MR. SHONTS' STATEMENT

In criticising the proposed plan, Mr. Shonts made a statement in part as follows:

"We recognize these points:

"1. The supremacy of the public interest in uninterrupted and efficient transportation service.

"2. The principle of collective bargaining for the purpose of securing fair and reasonable wages and working conditions, and also the principle of definite periods of employment.

"3. The necessity for an impartial tribunal with power to enforce its decisions in labor disputes.

"4. The necessity for such a change in the law as will insure uninterrupted service pending investigation by such a tribunal, and thereafter continuous service in accordance with its decision.

"5. The necessity for leaving with the employer the maintenance of discipline and efficiency, including the right to discharge for good cause, but with the right of a discharged employee to have a written statement of the cause of his discharge delivered at the time thereof.

"6. The right of an individual employee to leave the service before the expiration of the agreed period with the written consent of the employer, or, if such consent be refused, that the Public Service Commission may, for good cause shown, make an order which shall be in lieu of such consent.

"We do not believe, however, in your plan for the organization of employees or for a wage board, or that your commission should have the power to determine wages, salaries or working conditions, or to adjust grievances.

"We believe that it is against the public interest that the employees of the transportation lines in this city should be affiliated with labor unions which, to win their strikes in other trades or in other cities, may put this city to the detriment of a sympathetic strike. We believe that the plan or an organization which our own employees adopted last year is more in the public interest, as well as their own, and that their method of collective bargaining is more truly representative of the employees than your proposed wage board. Each class of employees has proportional representation, and the terms negotiated are submitted for individual approval so that no employee may be bound except of his own free will.

"Then the law should provide that no employee should leave the service except by consent as above mentioned. If any considerable number give written notice of intention to quit or to demand changed conditions or wages, or if the employer gives written notice of an intention to change wages or conditions, let the Public Service Commission forthwith ask the Appellate Division to appoint three arbitrators to determine the controversy, giving the commission the right to appear on behalf of the public. The decision, when confirmed by the Appellate Division, should be binding for a period of from one to three years. This plan insures an impartial judicial tribunal to pass upon the rights of the public, the employees and the employer, and prevents the Public Service Commission from being both prosecutor and judge, which is abhorrent to all systems of government. Let the law also impose severe penalties upon both employer and employee for a breach of the decision so made.

"As to our fourth objection—to your taking up the adjustment of grievances—we believe that these matters can better be left to the employees' own organization in conference with the officers of the employer as provided by our own brotherhood rules, which have been approved by our directors. The interposition of any outside body in the adjustment of ordinary grievances will not make for harmony and co-operation, but will tend to create a spirit of contention and insubordination."

FURTHER HEARINGS

The hearings before the commission were continued on Feb. 13 and Feb. 15. Those who were heard included Deputy Attorney General Merton E. Lewis; Everett P. Wheeler, representing the committee on industrial arbitration of the New York Reform Club; Pauline Goldmark of the National Consumers' League, and J. A. Fitch of the staff of *The Survey*. Mr. Lewis favored contracts of service for utility employees, with criminal punishment for breach by either party. He thought, however, that the easiest way to settle industrial disputes would be to confer this power upon the courts. The Attorney General should apply to the Appellate Division for arbitrators, whose decision should be reviewed by the court. Mr. Wheeler favored civil penalties rather than criminal, and the carrying out of awards under the supervision of the commission. Miss

Goldmark stated that the public should enter negotiations from the first step. She believed that utility employees should be guaranteed higher wages than those in private employment. Mr. Fitch said that standards of bargaining should be created and that an investigating body should be organized to get the facts without going so far as to restrict the right to strike. He thought that there should be no public supervision of mutual agreements or settlements between employer and employees unless either side or the public should appeal. Furthermore, he thought that rate bodies should not pass on wages, but that a separate body should be organized.

Capacity of Cast-Iron Car Wheels*

The Author Analyzes the Elements of Weight and Cost, and Advocates Increased Flange Thickness for Heavy Service

BY GEORGE W. LYNDON

President, Association of Manufacturers of Chilled Car Wheels.

IN the year 1904, the 700-lb. chilled-iron car wheel as used under 50-ton cars was recommended as standard by the Master Car Builders' Association, and with a subsequent modification increasing the weight to 725 lb., it was formally made standard in 1909. During the time intervening the rolled-steel wheel was introduced, and notwithstanding the alleged superiority of this metal, the new wheel weighed a minimum of 750 lb.

Since the year 1875, the great capacity of cars and the tremendous tonnage hauled has called for an increase in the weight of the car structure from 18,000 lb. to 65,000 lb., or an addition of 260 per cent, an increase in the weight of rail of 150 per cent and an increase in the axle of 200 per cent. Yet the weight of the wheel has increased only from 525 lb. to 725 lb., or 38 per cent.

While the chilled-iron wheel has always met increases in the capacity of the cars, one part of the wheel has received scant consideration and that is the flange. This is due, perhaps, to the fact that, during all the remarkable railroad development of the past forty years, the space between the running rail and guard rail has remained fixed at 1¾ in.

For years the chilled-iron wheel manufacturers have been trying to secure a stronger flange and have demonstrated the fact that 3/16 in. can be added to the thickness of the present M. C. B. standard. Compensation for the increase may be made by mounting each wheel 3/32 in. closer to the rail so as to maintain the M. C. B. standard dimension of 4 ft. 6 29/64 in. from back to back of flanges. This insures that the relation of the back of the flange to guard rail remains the same as at present and no change in track clearance is required. There can, therefore, be no objection from a track standpoint of making a liberal increase in the present flange thickness and the plan has received approval from a special committee of the American Railway Engineering Association.

Under 70-ton cars the load per wheel amounts to about 25,000 lb., and this requires almost 20,000 lb. flange pressure to change the direction of the truck. Therefore, with present conditions of operation, considering the increased speed, the thrust on the flange including impact is at least ten times greater than under the old 10-ton cars of 1850, and it must be apparent that the increased flange duty has not been provided for.

The Association of Manufacturers of Chilled Car Wheels believes that, because of the general conditions confronting us to-day and the need for a safety factor of operation, three designs of wheels with 3/16 in. increase in flange, would in a great measure solve the present troubles. Its recommendations for the three wheel sizes are as follows:

Weight of Wheel	Maximum Gross Load on Car
675 lb.	112,000 lb.
750 lb.	161,000 lb.
850 lb.	210,000 lb.

With regard to cost it may be said that about 30 per cent of all wheels sold are removed by foreign lines and the prices paid for these removals are fixed by the printed interchange rules of the Master Car Builders' Association, as follows:

	Chilled-Iron	Steel
New value, each	$9.00	$19.50
Scrap value, each	4.75	4.50
Net cost	$4.25	$15.00
Cost of removing from and replacing in trucks, per pair $2.25, each	1.12	1.12
Cost under car, each	$5.37	$16.12
Cost of two turnings	....	3.25
Total cost of wheel service, each	$5.37	$19.37

It will be observed that the total cost for wheel service for steel wheels is about four times that of the chilled-iron wheel, and upon this basis of comparison any substitute must yield four times the mileage or time service in order to equalize the cost. All chilled-iron wheels are guaranteed for a standard minimum period of service, and should any wheels fail in service through the fault of the manufacturer a new wheel is supplied without any cost to the user. Hence, the maximum net cost per year ranges from 52 cents to 90 cents depending on the size.

Any wheel that is sold for $20 will cost the railroad in interest charges alone (figured at 5 per cent per annum), more than the renewal charges of the chilled-iron wheel, because while the guaranteed net cost to the railroads is based upon six, five or four years' service respectively, the actual service is often twice as much.

During the two years last past, the price of all commodities have reached their highest figures. Nevertheless the price of the chilled-iron car wheel has practically remained constant.

In conclusion it may be said that the capacity of the chilled-iron car wheel has not yet been reached, and today there are in service wheels weighing 950 lb., or 225 lb. heavier than the heaviest present M. C. B. standard. These wheels are carrying a burden of 26,500 lb. per wheel and they have given such satisfactory service under engine tenders of 12,000 gal. capacity that no other type of wheel is considered by the user.

An additional weight of 25 lb. per wheel because of thicker flanges would not appreciably increase the tonnage, but this addition of metal would materially increase the factor of safety. If all wheel renewals in the country based upon 2,500,000 annual renewals, were increased in weight 25 lb. each, the total increased tonnage to be purchased would be 31,250 tons at $10 per ton differential, making a total additional expenditure of $312,500 annually.

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*Abstract of an address before the Canadian Railway Club at Montreal, Canada, Feb. 13, 1917.

At the January, 1917, meeting of the New York Railroad Club a paper was presented by Marcus A. Dow, general safety agent New York Central Lines. This contains the results of a comprehensive analysis of the subject. In conclusion Mr. Dow stated among other things that "the railroad or industrial official who will concentrate his energies and faculties to at least a reasonable degree upon the prevention of accidents is bound to attain success in that direction just as surely as he is bound to attain success in the efficient handling of any other phase of transportation. The first thing necessary is to formulate definite plans, and the next is consistently and continuously to work such plans."

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Milwaukee Center-Entrance Car Designed for Train Operation—European and American Practice in Setting Trolley Poles—Open Car for Winter Service in Boston, Mass.—New Electric Railway Equipment

(Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.)

Center-Entrance Cars for Milwaukee

New 50-Ft. Cars Retain Company's Former Wheel and Motor Standards But Have Low Center-Step Arrangement, Large Seating Capacity and Other New Features of Body Design

A radical departure from previous designs has been adopted by the Milwaukee Electric Railway & Light Company in the fifty new cars that have recently been placed in its city service. The new features include the center entrance and exit with front exit also, the use of multiple-unit control for train operation, and the installation of maximum-traction trucks. However, the company's standard three-wear, 34-in. driving wheel has been retained, and also the standard 70-hp. Westinghouse 306-CA-2 motor. The economy, from the maintenance point of view, of adhering to previous standards, and the rather severe service requirements for which these cars have been designed, were considered to be of sufficient importance to warrant sacrificing the advantages of the low floor. However, the ease of entrance and exit has been greatly facilitated by the well and step arrangement that has been used.

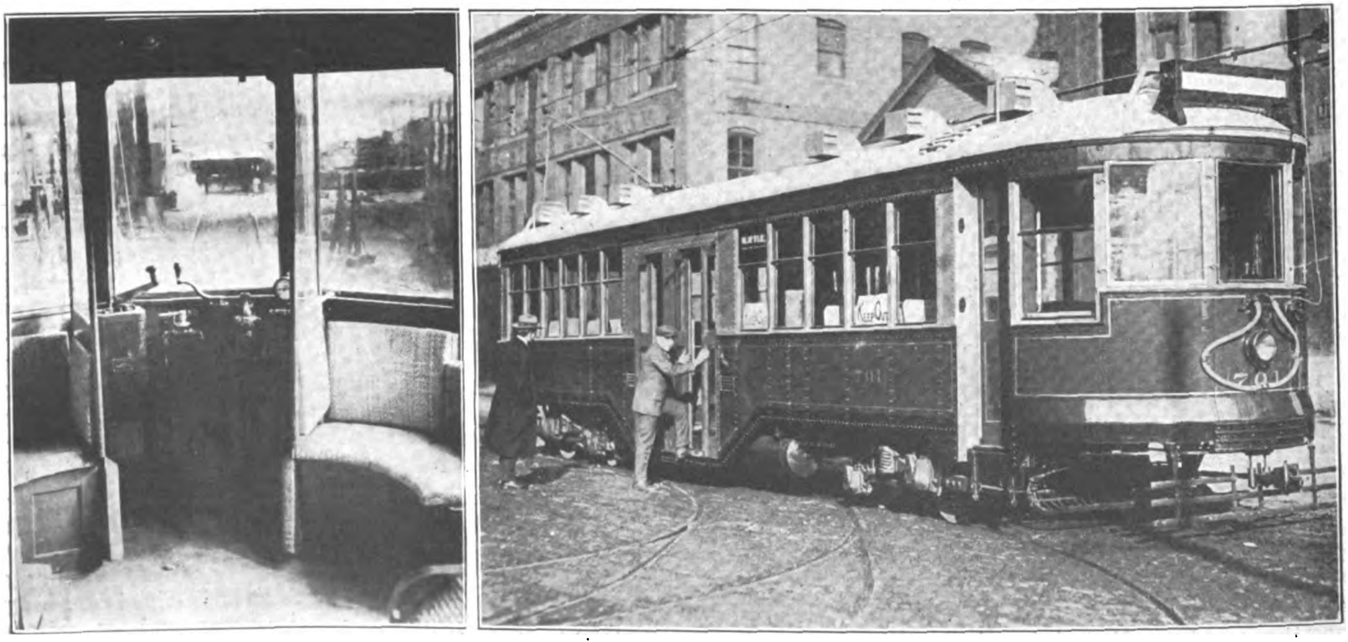
The design was controlled largely by the decision to operate the cars in two-car and three-car trains. During the morning and evening rush-hour service they will be operated in two-car trains, but it is planned to operate them in three-car trains on the long suburban lines to the parks outside of Milwaukee on days of especially heavy traffic. Under these conditions it was considered that the best location for the conductor would be at the center of the car. Also, the long runs require rather high speed, and with the heavy loads carried, it was considered essential to have a large motor. Accordingly the company's previous standard motor was utilized, and the advantages of the maximum traction truck added to it for the first time in Milwaukee.

The service requirements which the electrical equipment was designed to meet are summarized in the following table:

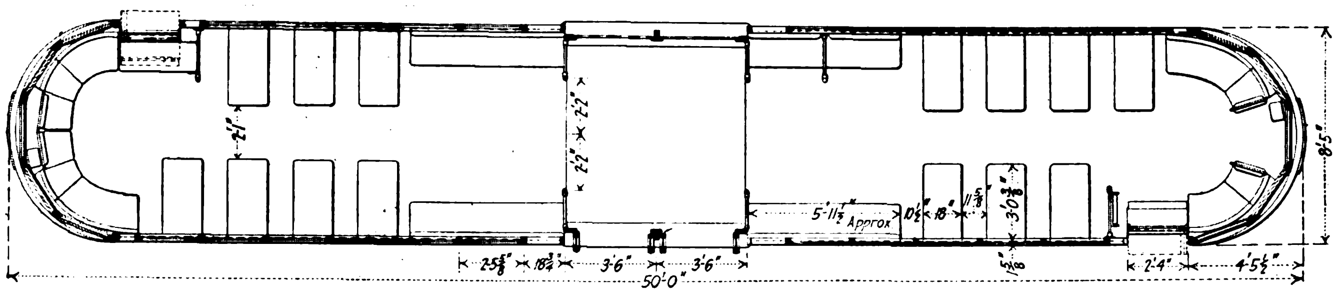
SERVICE SPECIFICATIONS FOR ELECTRICAL EQUIPMENT

Seating capacity	60
Capacity (with standing load figured on 4 sq. ft. basis)	115
Length of car over-all	50 ft.
Distance between bolsters	28 ft.
Width of car body over belt rail	8 ft. 5 in.
Weight of empty car and trucks (without electrical equipment or live load, max.)	36,000 lb.
Line potential:	
Maximum	600 volts
Minimum	400 volts
Average	500 volts
Total distance round trip	17.9 miles
Running time	106 min.
Schedule speed	10.15 m.p.h.
Stops per mile	7
Average duration of stop	6½ seconds
Wheel diameter:	
Drivers	34 in.
Idlers	22 in.

Multiple-unit operation is provided for by the use of Westinghouse H.L.D. control. This is a combination of pneumatic switch units and cylinder control, which has 600 volts on two fingers, but has the main control circuit operated at 110 volts. Automatic acceleration is provided, and in order to increase the speed of accelera-



INTERIOR VIEW OF MILWAUKEE CAR SHOWING MOTORMAN'S CAB; EXTERIOR VIEW OF CAR



FLOOR PLAN OF MILWAUKEE CENTER-ENTRANCE CAR

tion on heavy grades where it would be unduly slow with the automatic control, a push button is installed at the motorman's position by means of which he can gain manual control of the acceleration. This button is placed in an inconvenient place so that the motorman will not be inclined to use it when starting under normal conditions.

Car-Body Arrangement and Details

The feature of the car body design is the arrangement of floor ramp, well and entrance steps which divide the distance between rail and car floor in such a way as to make for easy entrance. The center well is reached by a single stationary step, above which the entrance and exit doors operate. Between the center well and the main body of the car there is a low step. From this point to the bolster of the car, a distance of approximately 10 ft., there is a ramp of 6 in. At the front exit door, which is made 28 in. wide, there are two steps, one of them stationary and the other of a folding type, that is operated in conjunction with the doors. The various step heights are as follows:

Top of rail to center step	14 in.
Step to well or vestibule floor	10 in.
Well floor to car floor	8 in.
Top of rail to front exit first step	15 in.
Second step	12 in.
Second step to car floor	12 in.

The pay-as-you-enter railings, etc., are so arranged that the conductor can stand in the middle of the well facing the entrance doors, which give two openings approximately 2 ft. 10 in. wide, and from this point he controls the movement and collects fares of passengers going to the front or to the rear of the car. The construction is such that it may readily be adapted to a combination pay-as-you-enter, pay-as-you-leave scheme, provided the company later decides to depart from the regular pay-as-you-enter practice in use at present in Milwaukee. The entrance and exit doors are controlled by two levers on the stanchion in front of the conductor's position. A light-signal connected with the doors gives the motorman the go-ahead indication, and ordinary stop signals are given by the passengers through buzzers or through a button placed in front of the conductor. Emergency stop signals are given by a single stroke bell operated from a push button which is installed on the center post between doors behind the conductor's position. It is placed in this position behind him so that it will be used only for emergency purposes, and one stroke of this bell is to be understood as an emergency stop signal to the motorman.

The car underframe is made up very largely of pressed-steel members with a few structural shapes. The superstructure is very largely of steel, but with end posts of wood in order to minimize the cost of repairs. Steel or composite board finish is used throughout the interior, and the cars are built with a double-wooden floor with insulating material between to cope with the winter heating problem. For this same reason an air space between the outside steel plates and the inside sheeting, and between the car roof and the composition board headlining is provided. This construction, of course, adds to the weight of the car, but is considered essential in the Wisconsin climate.

Fourteen Walk-over rattan-covered cross seats have been installed, together with four longitudinal seats adjacent to the center well, circular end seats in the ends of the car and a folding seat at each end-exit door. All seat cushions and backs are of the springless, sanitary type. The seating capacity of the car is fifty-six, but this is increased to sixty in the second and third car in a train by the two seats which fold up into the space occupied by the motorman and by the folding seats across the front exit, which will seat two passengers.

At the ends of the car the arrangement of the motorman's control equipment is ingeniously worked out so that practically no space is sacrificed when the control equipment is not in use. The two seats at the end of the car fold down by simply kicking the supports from beneath them, and two glass panelled doors forming the backs to these two seats open up to a position parallel with the length of the car and form an operating cab for the motorman. These doors lock in position, both closed and open, and serve when closed to protect the clothes of passengers from coming in contact with any grease which might be on the apparatus, and also to conceal the equipment and prevent passengers from meddling with any of it. The cab is converted for rear-end use by merely closing the doors to a position parallel with the end windows and raising the folding seats.

The car lighting includes the use of selector switches which control two series of 56-watt lamps equipped with reflectors. A special 23-watt circuit provides illumination for the hood destination signs and headlights, the side route signs being illuminated from the general interior car lighting. Ventilation is accomplished through the use of twelve exhaust-type ventilators placed symmetrically with six each side of the well, which are used in conjunction with the forced hot-air heating system.

The possibilities toward producing a car of light weight were somewhat curtailed by the limitations made necessary by the sixty-passenger capacity of the car, the heavy service requirements and the special construction against cold. A summary of the various weights is detailed below.

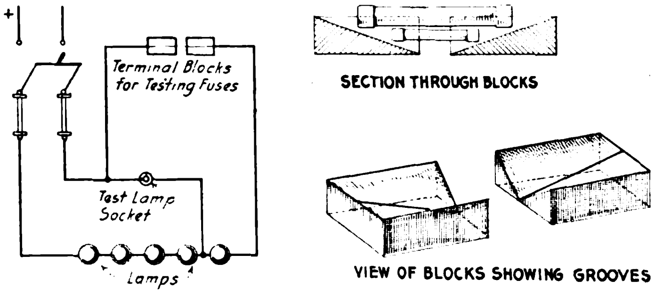
	Pounds
Motors	5,500
Electrical equipment	2,423
Truck, less motors	11,686
Air brake equipment	1,195
Heater equipment	495
Hand brake equipment	305
Sander equipment	111
Fenders	200
Draft rigging	820
Fare boxes	20
Signal bells	5
Signs and sign equipment	200
Miscellaneous equipment	91
Seating apparatus	1,350
Vestibule equipment	576
Door operating devices and door equipment	1,060
Window and window trimmings	873
Roof	2,034
Underframe	7,534
Sideframe	2 339
Miscellaneous equipment	2,921
Miscellaneous body details	262
Total	42,000

Special Contact Blocks for Testing Fuses

BY R. H. PARSONS
Electrical Foreman

A great saving in time is made possible by the use of special apparatus in connection with the common method of testing lamps and fuses.

In the ELECTRIC RAILWAY JOURNAL for Sept. 9, 1916, page 455, a test board with special fuse and lamp testing appliances was described, and another type of device that may be used for the same purpose is a special terminal block to make contact with the fuse under test. The blocks have slanting V-grooves, as shown in the accompanying drawing, to accommodate fuses of various sizes and also to protect the operator from electrical contact. Two blocks are so placed in the testing circuit that the smallest fuse can just span the distance between them. A larger fuse makes contact nearer the opposite ends of the blocks and its middle point, or the operator's hand, is remote from the bottom of the groove, thus insuring greater safety.


+
Terminal Blocks for Testing Fuses
Test Lamp Socket
Lamps
SECTION THROUGH BLOCKS
VIEW OF BLOCKS SHOWING GROOVES

PROTECTIVE CONTACT BLOCKS FOR TESTING FUSES OF VARIOUS LENGTHS

The terminal blocks and an old style, threadless socket, into which test lamps can be quickly pressed, are mounted on a slate base with the other testing apparatus. This equipment, if placed near the inspection or repair track for the use of the men working on cars, is very convenient.

Should Trolley Poles Be Set with a Rake?

BY J. G. KOPPEL
Electrical Superintendent of Bridges,
Sault Ste. Marie, Mich.

It is a well-known fact that many roads which use electric power for propulsion are building their overhead lines by setting the trolley poles with a certain rake, from 6 in. up to 2 ft. It seems to me that a line constructed with poles set with a rake gives a very poor impression. Such a line, even if new, always has the appearance of being thirty or more years old.

I saw the first street railway line built with poles set with a rake in London, England. These poles were all of good design and made of cast steel with cast-iron bases. The rake was about 6 in., and the poles were set without guy wires. A line built like that spoils the good appearance of the street, because we know that, no matter what we are building, the plumb-line, the square and the level are the three devices by which the construction is governed. Up to the present time human beings are accustomed always to see things looking straight, one way or the other, that is, either vertical or horizontal.

Going back to the English tramway line I will state that the English firm which built this line also built a tramway system at St. Petersburg, Russia, but the Russian engineers objected to the construction of a raked pole line, and the poles were, therefore, erected vertical. These have carried their load well and are still standing upright. Two other tramway lines were built, one at Riga and the other at Libau, by a German firm. The poles were built up from two U-irons with flat iron riveted in the centers, and all poles were set vertical on single and double-track lines.

A few weeks ago I happened to be in Montreal, Canada, where I noticed that the Montreal Tramway uses steel tubular poles set with a rake from 6 in. to 8 in. The impression made by the raked poles between straight buildings and vertical lighting poles was, upon me, very unfavorable. Further, on the Chicago, Milwaukee & St. Paul electrification I notice that guyed poles set with a rake are used.

In view of the difference between European and American practice in this matter, I wish to raise the question, among those who have had more experience in pole setting than I have had, as to what real advantage is to be gained by setting guyed poles with a rake. Will guyed poles set with a rake stand more load under ordinary conditions than guyed but vertical-set poles?

My opinion is that the present practice of raking poles is largely the result of blindly following precedents established in the early days of pole-line construction. It may be that the practice was developed for the purpose of covering up poor workmanship, so that by giving a pole a sufficient rake an observer cannot tell whether it had pulled over since it was set or whether it was originally set as seen. It seems to me, therefore, that it would be better to follow European practice because of the better impression that this type of construction makes upon the traveling public.

[NOTE.—In this connection the following quotations from a paper entitled "A Civic Duty for Engineers," by S. E. Doane, chief engineer National Lamp Works General Electric Company, delivered before the Cleveland Engineering Society, is of interest:

"It is still a frequent practice in this country to have the trolley poles leaning away from the pull of the cross-wires (and incidentally in some other directions, too). I have always wondered whether this was really necessary or whether it was being done just because it had always been done that way. I know now that this is not being done in Europe or rather that the poles are being put up with an over-leaning just large enough that they are pulled into the exact vertical when the tensional stress of the span wire comes on. I know that at least one of the largest firms there constructing electric railroads has provided tables to show how much their standard tubular steel poles will bend under the normal stress to which they are subjected. * * * To judge from appearances the same systematic method is followed with wooden poles."

The A. E. R. E. A. Engineering Manual, Ds 2b, specifies as follows:

"18. Wood poles with brackets shall in general have a rake from the track of 6 in. in 24 ft.; steel poles with brackets of 3 in. in 24 ft.

"Wood poles with spans shall have a rake from the track of 12 in. in 24 ft.; steel poles with spans shall have a rake from the track of 6 in. in 24 ft.

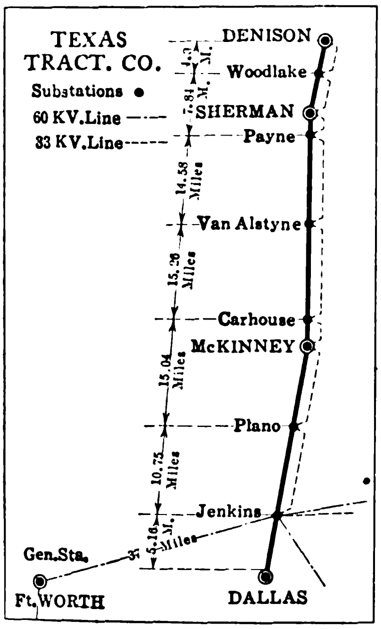
"When the strain is from the track, as with poles on the inside of a curve, raked poles, or head guys shall be used and standard rakes maintained.

"Double-bracket poles shall be set without rake; other poles between tracks, and poles under outside jurisdiction may be so set if necessary or required."—EDS.]

Overcoming Starting Troubles with 60-Cycle Converters on a Long Transmission Line

BY H. L. INGRAM
Superintendent of Substations Texas Traction Company, Dallas, Tex.

The principal trouble we have experienced with the 60-cycle rotary converter has been in starting. All units are started from the alternating current end as induction motors. When first installed, they were equipped with double-pole double-throw switches with rheostats in two lines for limiting the starting current supplied from the half-voltage transformer taps. These rotaries are all of the six-pole type. It was found if the circumference of each armature was divided into twelve equal parts and the proper points of division selected, that there would be six positions where the converter would start when the power was applied and six positions where it would not start. This at times caused damage to the commutators, collector rings and switches. The disturbance has been attributed to the unbalancing of the phases by having the rheostats in only the two lines. Hence the new installation at our Payne substation was equipped with triple-pole double-throw switches and a rheostat in each line, with the result that these converters will start from any position with much less sparking at all the direct-current brushes.



MAP SHOWING LOCATION OF POWER-HOUSE, SUBSTATIONS AND TRANSMISSION LINES, TEXAS TRACTION COMPANY

In starting up the machines, they are brought up to speed on the half-voltage taps and the field break-up switch is closed with the proper polarity on the direct-current side and then the double-throw switch thrown over in the full-voltage position. This method of starting had given entire satisfaction with the 25-cycle converters, but with the 60-cycle machines, when the change was made from half to full voltage, it was frequently accompanied by flash-overs, tripping of oil switches where the relay was set for as much as 400 per cent normal current and other troubles. It was found that a very few seconds after the machines had come up to full speed on the half-voltage taps and the field break-up switch had been closed, that they "hunted" badly, and this made it practically impossible to throw over to full-voltage conditions. This performance is more marked in the 200-kw. units than in the 300-kw. units and increases as the distance from the generating station increases and the load on the high-tension line decreases. The operators have become accustomed to this condition and have succeeded in getting good results by using a different field strength for each station and making the change before the converter starts hunting.

On a temporary installation at the Payne substation, transformers without half-voltage taps were used and the converter was started from full voltage by using a correspondingly increased resistance. While this was a make-shift arrangement, it gave excellent results, and no trouble was experienced in throwing from the resistance leads to full voltage at any time. It is the writer's belief that if a switch were provided with which to short-circuit the starting resistance, hunting on the half-voltage taps would be practically eliminated. We are having no trouble from line fluctuations, except at Jenkins' substation, where an occasional heavy surge on the 60,000-volt line will cause a flash-over. No remedy for this trouble has been found so far, but all things considered, we are realizing excellent results from a standpoint of maintenance and operation.

The Texas Traction Company in June, 1915, discontinued the generation of power at 25 cycles and 19,100 volts, to take advantage of a power contract with the Texas Power & Light Company, which now supplies current at 60 cycles and 33,000 volts to five of the traction company's substations. Another substation at Jenkins, is supplied with energy at 60,000 volts. While the company was generating its own energy at 25 cycles frequency, each of these six substations was equipped with one 300-kw. rotary converter. These were displaced, when the company began to purchase 60-cycle power, by one 300-kw. unit in each of three of the stations, and two 200-kw. units in each of the remaining three. This arrangement was installed in view of the plan to ultimately operate the portion of the line south of Sherman at 1200 volts direct current and abandon the substations at Plano and Van Alstyne.

With the 25-cycle system, the substation farthest from the power house was served by a 35-mile transmission line, while under the present arrangement with purchased 60-cycle power, the most distant substation is 95 miles from the generating station. This, incidentally, is the longest transmission line in the country serving 60-cycle converters. The writer is also in charge of six substations for the Southern Traction Company, which operates south of Dallas at 1200 volts direct current supplied from motor-generator sets, and finds that the 60-cycle converters are just as dependable and have the increased efficiency in their favor.

Protecting Cables in Manholes

The Composite Metal Lath Company, New York City, has just developed a method of wrapping the cable with a mesh of steel wire upon which ordinary brick or terra cotta has been baked. The accompanying illustration shows a 2½-in. feeder on which the brick lath is used as a base for a protecting coat of sand and cement.

FEEDER CABLE PROTECTED BY METAL LATH COVERING

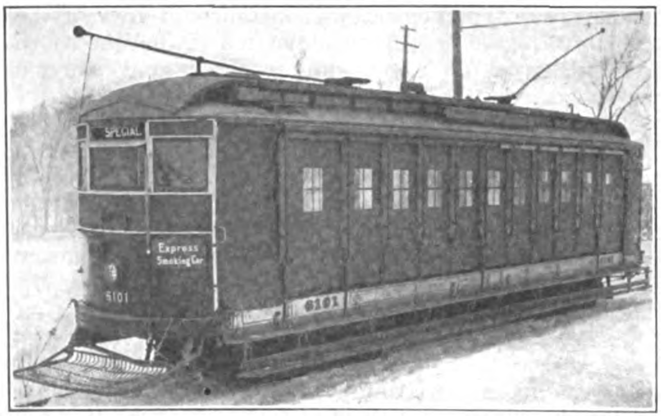
This covering is made up in large sheets 40 in. wide by 16 ft. long. It is usually cut in strips about 3 in. wide and wound spirally about the cable to be protected. A mixture of two parts sand to one part Portland cement is then wiped on by hand to a thickness of about ⅝ in. This covering can easily be applied in manholes or other confined places. It is claimed that this material is less expensive than an asbestos or rope base. Other methods of fireproofing cables in manholes were described by Albert F. Hovey in the ELECTRIC RAILWAY JOURNAL for Nov. 18, 1916, page 1068.

Open Car Equipped for Winter Service as Shopmen's Express

Heaters Under Seats and Side Curtains with Flexible Windows Make Fourteen-Bench Car a Popular Smoker on Bay State Street Railway

The withdrawal of a number of closed cars on the Bay State Street Railway for remodeling recently led to an investigation by the management of the possibilities of equipping some of their open cars for peak-load shop service in winter. A fourteen-bench car thus equipped was placed in service on Jan. 24 on the Neponset-Quincy Point line. The car is at present run as an express smoker for men only without stop between Neponset and the Fore River Shipbuilding Corporation's plant, a distance of about 4 miles, the running time being twenty-two minutes compared with twenty-eight minutes by ordinary cars making stops. A single 5-cent fare is charged, and on three recent trips the car carried a total of 284 passengers, the seating capacity being seventy compared with a seating capacity of thirty-four in the usual closed cars operated on this line.

The most interesting features of the car are the use of electric heaters beneath twelve of the fourteen seats, and the provision of transparent, non-inflammable windows 15 in. x 21 in. in size in Pantasote curtains. The car is equipped with forty Gold electric heaters of the cylindrical type wired in two circuits. All seats are equipped except the two end seats, and the corresponding two seats just inside the bulkhead are provided with only two heaters each. The heaters have sheet-iron guards on each side to prevent contact with passengers' shoes. Transite guards 3/16 in. thick are also provided under the seats to serve as heat insulators.



SUMMER CAR EQUIPPED FOR WINTER SERVICE, BAY STATE STREET RAILWAY

HEATING TESTS

Before the cars were placed in service a number of tests of the heating equipments were made. With an outside temperature of 22 deg. Fahr. and the car standing still with curtains lowered, after a preliminary heating of one hour on half-heat, the temperature at No. 1 end inside rose from 22 deg. to 34 deg.; in the middle from 24 deg. to 36 deg.; and at the No. 2 end, from 24 deg. to 38 deg. All the heaters were later switched into circuit, and in a forty-five-minute heat run the temperature of No. 1 end, which had reached 44 deg., rose to 78 deg.; the temperature in the center rose from 50 deg. to 78 deg., and the rise at No. 2 end was from 52 to 76.5 deg. During the forty-five-minute run above summarized, the outside air temperature was 29 deg. Readings were at the height of the passengers' heads.

In a test run from the Washington Avenue carhouse, Chelsea, to Woodlawn and return, about 2 miles, with all heaters on, the interior temperature fell from 77 deg. to 52 deg. between the carhouse and Woodlawn, and from 52 deg. to 49 deg. on the return run, the outside temperature being 29 deg. These figures indicated the feasibility of operating such a car with entire comfort. The current consumption with all heaters in service is 63 amp. at 550 volts, but it is not likely that it will be necessary to run at full heat a large percentage of the time, and it is also to be borne in mind that the service is rendered only in the morning and evening rush hours. This brings the heating demand on the system peak, but the increased carrying capacity of the car partly offsets this. The usual inclosed cars of the company at the terminals of the Quincy Point line were literally deserted by the passengers in favor of the converted unit, and it has been decided to place similar cars in service in Brockton, Lynn, Salem, Lowell, Lawrence, Taunton, Haverhill and Fall River.

The following table gives the cost of adapting the car for winter service:

Temporary vestibules	$30.00
Changing register cords	1.60
Forty Gold heaters	100.00
Two heater switches	14.00
Window material	15.00
Installation of heaters	29.00
Installation of window material	10.00
Transite guards	12.00
Pantasote end curtains	35.50
Total	$247.10

This work can be done in four days, and the car can be dismantled for summer service in half a day. As shown in the illustration, glass windows are used in the converted vestibule, and over the middle window is a 5-in. wooden visor for weather protection. This window is provided with spring hinges, and when the window is opened it is held over the motorman's head in a plane parallel with the visor in front of the window. Extra side curtains of Pantasote are provided to inclose the side of the platform.

The fare register cords have been placed on the interior of the car. It is possible to collect the fares by opening the side curtains at only three or four points in the car, but in the actual handling of traffic the passengers seem to prefer to have the conductor climb over the seats inside of the car rather than to open the curtains.

The flexible windows in the curtains provide ample light for reading. They are made of a material known as "Celestron," furnished by the Chemical Products Company of Boston, Mass. The cost of this product is 30 cents per square foot, compared with 25 cents for celluloid, but celluloid windows are regarded as unsafe, and their use is prohibited by the insurance companies and the Massachusetts Public Service Commission.

New Rules for Cleaning Buffalo Cars

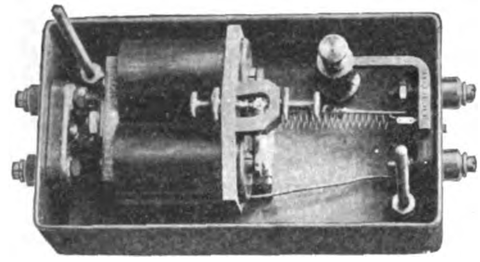
The International Railway, Buffalo, N. Y., has created the position of assistant general carhouse foreman to supervise the cleaning of its cars. Heretofore this work was handled by the carhouse foreman of the separate barns. The new cleaning and sanitary rules are:

"In the interior of the car, all woodwork, moldings, headlinings, window posts, seat cushions and backs, must be thoroughly wiped down with cheesecloth dusting rags; lamps must be thoroughly cleaned with damp chamois skin; all soiled signs must be replaced with clean ones; ironwork in cabs and seat pedestals must be thoroughly wiped down, first with damp kerosene waste, then with dry waste; all pockets must be thoroughly cleaned with wide-blade scrapers to be furnished for the purpose; all mopboards and floors must be cleaned with soap and water or car cleaner; the solution must contain the proper amount of disinfectant; windows must be cleaned with pumice stone or cleaning powder; after the glass is clean it must be polished with damp chamois skin. All surfaces on the exterior must be cleaned with a special cleaner, and in dry weather the exterior must be wiped down with waste."

Relay for Controlling D.C. Circuit Breakers

The relay shown in the accompanying illustration has been developed by the Westinghouse Electric & Manufacturing Company of East Pittsburgh, Pa., to give overload protection on d.c. circuits. The operating parts of the relay include a small two-pole electromagnet with a special winding and a simple adjusting mechanism. These are inclosed in a dustproof aluminum case.

The electromagnets are so wound that the relay will operate on from 50 to 80 millivolts. It can, therefore, be used with the standard 50-millivolt ammeter shunt without appreciably affecting the meter reading.



OVERLOAD RELAY FOR D.C. CIRCUITS

The relay is particularly applicable where it is necessary to open a circuit breaker by current other than that in the line in which the breaker is placed. For example, with three-wire generators, the circuit breaker is in the main line, but the tripping coil must be controlled by the actual armature current of the generator. By the use of the relay the circuit breaker can be located at the most convenient place in the line which it is to open, and be controlled by the current in another circuit by simply inserting an ammeter shunt in this circuit and running light leads to the relay.

Meter for Measuring the Heating Effect of Varying Currents

The continuous capacity of a railway motor which is limited by the amount of heat which it can dissipate is determined by the maximum value of the root-mean-square current at which it can operate without exceeding a safe rise in temperature. This root-mean-square current is the square root of the average of the squares of the instantaneous current values over a given period of time. The determination of the current value by the ammeter method where the current is changing rapidly is not only difficult but tiresome and expensive, especially when readings must be taken over a considerable period of time on a moving car or a locomotive.

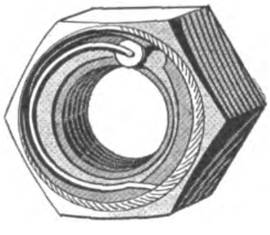
To avoid these difficulties the Westinghouse Electric & Manufacturing Company has developed the root-mean-square meter in which all or part of the current is measured by passing it through a resistor immersed in a quantity of water. Since the heat generated is proportional to the square of the current the temperature of the water will, except for heat losses, be raised in the same proportion. Every change in current value will virtually be recorded on the basis of the square of the current at infinitely small time intervals by the rising temperature of the water. Rapid radiation of heat is prevented by the use of a vacuum jar, and in external appearance the meter looks very much like the ordinary thermos bottle. To determine the root mean square of the current it is necessary only to observe the elapsed time and the rise in water temperature. By applying these values to the calibration curve of the instrument the correct result can be readily determined.

By the use of proper shunts for direct-current and instrument transformers for alternating current, this meter can be used for measuring current on high-voltage as well as low-voltage circuits. Careful laboratory tests have shown that the error of this instrument is less than 2 per cent.

A Self-Tightening Combination Plain and Lock Nut

The accompanying drawing shows the "Roller" lock nut with the steel cover removed, this fitting in the recess in the nut face. The lock is a steel roller held in place by a brass spring arm which is anchored at the outer part of the nut. The nut is spun on by hand, whereupon the small steel roller wedges into the threadway and effects an absolute lock against any backward movement of the nut. This lock, however, permits the nut to go forward so that the effect of vibration is to cause the nut to creep up or along the bolt to a tighter seat. The lock nut is therefore not affected by the stretching of bolts since it takes up slack automatically.

To remove this lock nut the application of strong wrench pressure is all that is required. In effecting this removal the roller bites deeper into the threadway, enabling the nut to turn slightly so that the roller then drops into the circular recess, thus allowing the nut to be spun off by hand. It will be observed that only the threadway is nicked, and the bolt thread itself is not injured in any way.



SELF-TIGHTENING PLAIN AND LOCK NUT

This style of lock nut is not dependent on thread friction and is longer lived than a gripping or friction lock nut. It is a combination plain and lock nut in one unit, which combines the functions of a lock nut, a plain nut, a cotter pin and a spring washer, and it is no larger than an ordinary nut. It was placed on the market at the time of the 1916 convention of the American Electric Railway Association by the Roller Lock Nut Company, Inc., New York City, and since that time it has been used successfully by many railways.

Mechanical Training Course for Boys

A systematic course of training open to boys from sixteen to eighteen years of age is in effect at the shops of the United Railways Company of St. Louis, Mo. Each apprentice furnishes his own tools, but the company provides tool boxes. The length of the course is four years. At the beginning the pay is 12 cents an hour, and this is increased at the rate of 1½ cents per hour every six months. Every apprentice must attend school at least two nights a week in conjunction with his instruction in the shops. This gives the necessary training in mathematics, drafting and applied science, the course being arranged by the master mechanic in conference with the school authorities. The tuition is paid by the railway company.

News of Electric Railways

Traffic and Transportation

Financial and Corporate Personal Mention Construction News

Five Electrification Projects

Lehigh Valley, Boston & Maine, Pennsylvania, Erie and Chicago Terminal All Included in Current Reports

The past week has been notable for the number of rumors that have been reported of electrification on various steam railroads. Of these the project of the Lehigh Valley Railroad is the most ambitious as well as the most definite. The company authorizes the statement that W. J. Wilgus has been retained as consulting engineer to investigate the possibility of electrifying a section of the main line from Mauch Chunk, Pa., to Pittston Junction, a distance of 63 route miles. This section is double-tracked throughout and includes a 25-mile low-grade freight cut-off past Wilkes-Barre. The company's main coal-carrying branch also is involved in the electrification project. This is a 52-mile double-track line. It extends eastward from Mount Carmel, Pa., through the anthracite mining district and joins the main line at Penn Haven Junction, just north of Mauch Chunk.

$20,000,000 INVOLVED

From this outline of the projected electrification it is evident that the Lehigh Valley has under consideration the electric operation of the heavier part of its tonnage trains of coal, since the electrified divisions are located within the mountainous districts containing the anthracite coal fields and serving the railroad's west-bound traffic across the mountain range traversed by the main line. The total route of 115 double-track miles, including the Wilkes-Barre cut-off and sidings, if electrified, is likely to involve an expenditure approaching $20,000,000, but in view of the heavy coal traffic that the road has handled during the past year or two, a large return on the investment should be possible. Power at a low price should be available from the several large central stations that have been constructed in the coal regions to make efficient use of refuse from the numerous anthracite mines. Data regarding the character of electric equipment to be installed are, of course, lacking at the present time, but indications are that the engineer's report on the project will be completed within a few months. A definite decision in regard to the commercial possibilities of the proposed installation will then be possible.

Less definite than the report regarding the Lehigh Valley's electrification is the rumor that Chicago's steam railroad terminals are to be electrified as a sequel to the recently announced plan of electric operation of the Illinois Central Railroad's terminal service. This has its basis, apparently, in the fact that a bill requiring electrification for all Chicago roads within ten years is to be introduced at the Illinois State Legislature now in session in Springfield, Ill.

A legislative act to provide for electrification of a 10-mile branch of the Boston & Maine Railroad between Dover and Portsmouth has also been introduced in New Hampshire. The aim here is to establish an hourly passenger service between the two cities mentioned.

BALTIMORE WORK PROBABLY NOT IMMEDIATE

A rumor to the effect that the Baltimore tunnel electrification plan of the Pennsylvania Railroad has been revived has also been going the rounds during the week. This, however, appears to have originated largely in the fact that the railroad company is endeavoring to secure permission to expand its facilities in Baltimore, since three ordinances regarding improvements to the company's line in that city have been introduced. None of these, however, includes any statement regarding electrification, and there is no warrant for expecting any immediate installation in Baltimore in connection with this matter, although the possibility of electrifying the main line of the Pennsylvania Railroad between Baltimore and Washington has been under consideration for several years past.

Very much the same considerations apply to a revival of the rumor that the Erie Railroad is to install electric operation on the Jersey City-North Newark section of its Greenwood Lake Branch. This has been talked of for years, and owing to the preponderance of local passenger traffic on the line, and the necessity for frequent short trains, the opportunity for economy through electrification is more or less obvious. It is doubtful, however, whether traffic is sufficiently heavy to warrant the increased investment, and at the present time the project is just about where it has been for the past five years.

Bridge Controversy in Kansas City

Bond Filed by the Kansas City Railways Secures Right to Operate Over the Kaw River

The federal court has been asked to intervene to protect street railway traffic between the Kaw River district of Armourdale, Argentine and connecting lines, and Kansas City, Mo., over the river. The specific proceeding was a temporary injunction granted at the request of the Kansas City Railways, preventing the destruction of the Kansas Avenue Bridge. The Kaw Valley Drainage Board had ordered this bridge destroyed as a flood menace. The railway was using this bridge. The company had previously been denied the use of the Twenty-third Street trafficway bridge and viaduct, which was to replace the Kansas Avenue bridge. The result would have been the stopping of railway traffic at this point, and the isolation of a large district.

HOW THE SITUATION AROSE

The situation arose because the commissioners of Wyandotte County demanded a large payment by the railway on the new viaduct, whereas the company's share of expense on the viaduct was otherwise provided for in a contract that was made last summer by the company with the commissioners.

The Kansas Avenue bridge over the Kaw River has been used for years for wagon, foot and street railway traffic. The Twenty-third Street viaduct and bridge were to replace it. The building of the temporary approach on the Missouri side, and the completion of track-laying on the entire bridge and viaduct, and approaches, made possible the use of this substitute bridge almost at once. Just as the company was preparing to use the new structure, however, and when the Kaw Valley Drainage Board had issued its order for the destruction of the Kansas Avenue bridge, the county commissioners demanded that the company pay to the county $250,000 before the commissioners would allow the company to use the trafficway. The $250,000 represented one-half the cost of the trafficway. With one bridge ordered destroyed and the use of the other interdicted except on terms involving disregard of a suit that was pending the company as a last effort in its own interest appealed to the federal court.

On Feb. 1 an agreement was reached in the federal court whereby the company will put up a bond and the Wyandotte County Commissioners will allow the company to use the Twenty-third Street trafficway as soon as the Kaw Valley Drainage Board begins the destruction of the Kansas Avenue bridge. The controversy over the payment of the railway's share on the trafficway is left for settlement to the suit now pending. A bond of the company will guarantee that it will pay in accordance with the ruling of the court in that suit.

Col. Williams Hits Commission

Asks if Regulation Is Worth the Price—Commissioner Whitney Replies

The current number of the monthly publication of the Brooklyn (N. Y.) Rapid Transit Company contains two contributions from the pen of Col. Timothy S. Williams, president of the company. The first severely criticizes certain "short-sighted men in office who play the rôle of demagogue," and later on says that "indulgence in official graft" has given way to "political hypocrisy." The second article, "The Price of Regulation," deals directly with the Public Service Commission. The first article said in part:

"There will be at least one fixed rule of conduct scrupulously adhered to so long as the writer [President Williams] has any influence in the management of the B. R. T. system. That rule is frankness, observance of obligations and honesty. If, as occasionally happens, short-sighted men in office play the role of demagogue, and seek to make personal capital unjustly at the expense of our corporation, we shall expect to tell the truth, even though that truth may offend the sensibilities of those whom it hits. Indulgence in official graft has fortunately become obsolescent, but political hypocrisy is conceded to be more prevalent than ever. One way of meeting this new tendency is by cajolery (commonly known as 'jollying'), flattery and meekness, so that the Pharisee in office may gratify his taste for publicity while at the same time privately bargaining with the corporation. This is not the right way nor the safe way."

The second article, after discussing the third-tracking of the company's elevated lines, says in part:

"It will be remembered that when the dual system contracts were under consideration the city's representatives insisted upon a provision that even when the companies were expending their own money the Public Service Commission should have complete authority over plans, specifications, form of contract, award of contracts, and costs. The Interborough Company refused to accept all of these drastic provisions as to its own third-tracking work. The Brooklyn company deferred to the city and accepted them.

BROOKLYN COMPANY MORE CONFIDING

"The Interborough Company was more worldly wise. We were less sophisticated and more confiding. We trusted to the good faith, reasonable judgment and prompt action of the Public Service Commission. The Interborough went promptly to work, made its own plans and specifications, let its own contracts (without competitive bidding), determined its own costs, and the result is a completed third-track in operation a whole year.

"The Brooklyn company went to work with equal zeal, but at nearly every step has encountered delay, criticism, supervision, or opposition as the penalty for subjecting its efforts and expenditures to what is called official regulation and supervision. Is regulation worth the price? And why was there discrimination?"

MR. WHITNEY'S ANSWER

To these criticisms Travis H. Whitney of the Public Service Commission replied in part:

"The statements made by Colonel Williams are mostly untrue. As a matter of fact, the B. R. T., with the alleged burden of approval by the commission, has succeeded in completing more mileage of rapid transit lines and in getting them into operation earlier than has the Interborough. The work upon which he congratulates the Interborough is the third-tracking of the Second, Third and Ninth Avenue lines, completed and put into operation on Jan. 17, 1916, to the extent of a little over 12 miles of track. At that time the B. R. T. had at least three times this mileage of rapid transit lines in operation. Apparently by this article Colonel Williams is seeking to convince his directors and stockholders that the Public Service Commission has delayed the completion of the Fulton Street third-tracking. As to this I merely wish to state that shortly after the dual contracts were signed Colonel Williams himself applied to the commission in the matter of the relocation of the elevated in Adams Street, thus making the lower end of Fulton Street an open question."

City Rejects Payment

Seattle Rejects Payment Tendered with Conditions Attached

The Puget Sound Traction Light & Power Company, Seattle, Wash., as noted in the ELECTRIC RAILWAY JOURNAL of Feb. 3, page 221, tendered the sum of $64,387, representing 2 per cent of its gross earnings for 1916, to the city recently under protest, with the stipulation that in accepting it the Council agreed not to begin a suit to require compliance with franchise obligations that require paving of right-of-way with the same material and at the same time that the remainder of the street is paved. Walter F. Meier, assistant corporation counsel of the city, advised the Council to return the check to the company unless the company was willing to pay the sum named under protest and without further conditions. On Jan. 24 the Council, in reply to the tender, adopted the report of its finance and franchise committees and rejected the tender. In his opinion to the Council Mr. Meier said:

"Whether the city shall insist upon the enforcement of the obligations inserted in the franchises granted by it is wholly a question of policy, determinable by the legislative department of the city. The acceptance of such tender, with the conditions annexed, would constitute a voluntary surrender by the city of its present right to insist upon complete compliance with the terms and conditions inserted in the franchises now held by the Puget Sound Traction, Light & Power Company. We are unwilling to say that the acceptance of a tender conditioned as this one is would not lead to undesirable legal complications, and unless the city desires to reverse its policy, then the check of the company should be returned with the statement that if the company desires to pay the amount due under protest but without attaching any conditions thereto, other than its payment under protest, the same will be accepted. The city does not recognize the right of the company to attach any conditions whatever to the payment of 2 per cent of its gross earnings as required by its franchises, and unless the company complies with this condition, the city will institute proceedings to compel compliance in this respect."

WHAT THE COMPANY ASKED

Nearly two years ago the company petitioned the Public Service Commission for an order relieving it from certain of its franchise obligations, the payment of 2 per cent of its gross earnings to the city annually, the paving of its right-of-way and the payment of any portion of the cost of Lake Washington Canal or other waterway bridges. Since then the tax on gross earnings has been paid under protest, and the right-of-way has been planked rather than paved. In tendering the amount due for 1916 the company took into consideration the action of the Council in directing that suit be instituted to force it to pave its right-of-way rather than to plank it, and made it a condition of acceptance of the gross earnings tax that no such suit would be started until the Public Service Commission had acted on its petition for relief.

Labor Opposes Constabulary

Representatives of organized labor appeared in force at Albany on Feb. 13 at a joint hearing before the finance committee of the New York Senate and the committee on ways and means of the Assembly to oppose the bill introduced by Senator Mills to create a State constabulary. A similar bill was defeated in the Legislature last year, largely on account of labor opposition. The labor men were the only ones to oppose the present bill. They heckled George F. Lum, deputy superintendent of the Pennsylvania State Police, and attacked the work of the Pennsylvania constabulary in the recent strike of the employees of the Wilkes-Barre (Pa.) Railway. Representatives of labor insisted the bill should be amended so as to eliminate the proposed constabulary as an agency for the maintenance of order in labor disturbances. They want the activities of the force confined to patrol duty and the suppression of crimes and disorder in the rural districts. President Holland of the State Federation of Labor said that industries which desired special protection should pay for it and not seek to shift the expense to the taxpayers.

Operating Allowances Discussed

The request of the Cleveland (Ohio) Railway for an increase in its operating allowance under the Tayler franchise has brought forth a flood of suggestions and criticisms from the friends of 3-cent fare. Councilman Stolte has proposed competing lines, although the city has guaranteed the dividends on railway stock. Councilman Harry C. Gahn believes that if the Council refuses the increase requested the matter should be submitted to a referendum vote. Fielder Sanders, street railway commissioner, is protesting against paying off the operating and maintenance deficits in lump sums at once. He argues that the company should charge these amounts off in monthly payments.

Commissioner Sanders has submitted his ideas of a subway terminal to the City Plan Commission, but has not yet made his report to the City Council on his investigation of the matter in eastern cities.

Councilman Taylor has proposed that the street railway commissioner's office be done away with and that the money spent by that office be applied as relief to the allowances for operation and maintenance, which are now insufficient.

Wheeling Wages Readjusted

Supplement to Existing Contract on Wages Agreed to by Company and Men

On May 1, 1915, the Wheeling (W. Va.) Traction Company entered on the fourth three-year agreement with its trainmen, as local union No. 103 of the Amalgamated Association of Street & Electric Railway Employees of America. This agreement provided for a sliding scale of wages ranging from 22 cents an hour for the first year of service up to a maximum of 31 cents an hour during the last year of the contract, the men being increased 2 cents an hour upon their respective anniversaries with the company. On Jan. 1, 1917, the scale ranged from 22 cents to 30 cents, and the contract still had sixteen months to run.

During the early part of January the union, citing the increased cost of living as its reason, passed a resolution requesting the company to change Sec. 1 of the existing contract. This section covered the wage scale, and made it necessary for a man to be in the service at least five years to reach the maximum wage. The change which was asked was to the following scale: first six months, 30 cents; second six months, 32 cents; third six months, 34 cents; after eighteen months, 36 cents.

In its consideration of the matter the company was governed by many factors. Due to the unusual industrial conditions and the high price paid for labor particularly by the steel mills of the Wheeling district the company was unable to obtain the class of men it desired for its service. In addition it felt that the men were entitled to at least a temporary increase due to the unusually high cost of living. For these reasons the company was willing to deal with the men for a revision of Sec. 1 of the existing contract, but did not see fit to grant the increase asked for by the union. After several conferences between the officials of the company and the union, a supplement to the existing agreement was signed on Feb. 5, providing for the payment of 3 cents an hour from Jan. 1 to April 30, 1917, in addition to the rate called for by the existing contract; from May 1, 1917, to the expiration of the present agreement, or April 30, 1918, 4 cents an hour in addition to the rates called for by the contract for the first and second year in the service of the company and 3 cents an hour in addition to the contract rate to those men more than two years in the company's service. This means that until April 30, the scale will be from 25 cents to 33 cents and from May 1, to the expiration of the agreement, from 26 cents to 34 cents an hour, or an increase over the contract rate of approximately 10.8 per cent for the first mentioned period and 11.2 per cent for the last-mentioned period.

In addition the company voluntarily suggested and incorporated in the supplemental agreement a provision that its men receive an additional 3½ cents an hour while breaking in students. No additional pay had been allowed for this work in the past and the company believes that with this inducement its students will be better trained.

Mr. Dempsey Sentenced

Fine of $500 Imposed in What Is Said to Be First Conviction for Failure to Obey Commission Order

John J. Dempsey, superintendent of elevated transportation of the Brooklyn (N. Y.) Rapid Transit Company, was fined $500 on Feb. 13 by County Judge Roy for failing to obey an order of the Public Service Commission. The fine was paid under protest. Mr. Dempsey was convicted of failing to stop the Fifth Avenue "L" trains at Third Street, as ordered by the commission. Judge Roy said:

"The verdict in your case, Mr. Dempsey, is more a conviction of the railroad system of this borough than a conviction of you personally. The evidence presented by the District Attorney fully justified the conviction. The order of the commission which you were charged with failing to obey was plain and simple and could not have been misunderstood. Yet for over three years it was repeatedly disobeyed. The vast majority of our citizens have a deep-seated conviction that the railroad has persistently sought to discredit the commission and its orders. I am told this is the first conviction in this country for violation of a Public Service order. Probably for this reason, but also because you are not an officer of the corporation, I consider the ends of justice will be met by the imposition of a fine of $500."

In the plea which he made for Mr. Dempsey before sentence was passed Attorney Marsh for the company reviewed the entire proceeding. He concluded his remarks with this appeal to the court:

"Unless the court believes the violation was willful and intentional, it would seem to be unthinkable that a sentence of imprisonment or anything but a nominal fine should be imposed."

First Arbitration in Kansas City

Outside Expert Passes Upon Questions in Dispute Under the New Franchise

Under the franchise of the Kansas City (Mo.) Railways the city's interests are handled by Robert P. Woods, and the company's by Philip J. Kealy, who together constitute the board of control. The franchise provides that when these members are unable to agree the Court of Appeals shall act as or appoint an arbiter. The first case of difference developed about a month ago. The court appointed James E. Allison, at one time chief engineer and commissioner of the St. Louis Public Service Commission, to render a decision. The city contended that $30,000 paid by the company in lieu of transporting dirt from the station park, which moving of dirt had been required in the franchise, should be charged to operating expense. Mr. Allison held that it should go into the company's valuation. The city contended that $41,000 paid to the city and to the city's attorneys and appraisers who aided in the negotiations for a new franchise should be charged to the reorganization fund, and not be charged to either capital or operating expense. Mr. Allison upheld the city's contention. The city contended that all expense of constructing new tracks, tearing out the old tracks, and making replacements should be charged to operating expense. Mr. Allison decided that such expenses are a capital charge and should be added to the investment.

Power Improvements in Detroit

Early in the spring the Detroit (Mich.) United Railway will begin work on extensive improvements at power station B, Atwater and Riopelle Streets. Included in the improvements will be a new smokestack, 250 ft. high, 14½ ft. in diameter inside, at the top.

There are at present three sets of boilers, eight 250 hp., eight 300 hp. and eight 350 hp. The battery of eight 250-hp. boilers will be removed and for the present in place of these boilers will be installed four type M-22 Stirling boilers of 603 hp. each with superheaters. Space will be left for the installation at a later date of two additional boilers.

This work will involve substantial building alterations. Excavations will be made for a basement, the floor of which will be below the grade of the present boiler room floor.

The new boiler room floor will be several feet above the level of the present boiler room floor. The section of the roof over the eight boilers that are to be removed will be raised about 18 ft. The present bucket coal conveyor, which now serves the eight 250-hp. and the eight 300-hp. boilers, will be maintained in operation throughout the alterations. The present steel and concrete coal bunkers will be enlarged by extending the sides vertically. Larger steel supporting columns for these bunkers will replace the present columns. A new ashbin with an independent ash-conveying system will be built. Two Griffin steam ash conveyor systems will be installed, one from the present 300-hp. boilers, and one from the new 600-hp. boilers. Six retort Taylor stokers will be installed under the boilers, and Diamond soot blowers will be used. Turbine driven pumps will be used for boiler feed. The distance of the mud drums of the Stirling boilers above the floor line will be 8 ft., which with the ample capacity of the stack will insure smokeless operation.

Increase in Wages in Ohio.—The Ohio Electric Railway, Springfield, Ohio, operating 617 miles of city and interurban lines, has announced an increase in the wages of its trainmen amounting to from 2 to 3 cents an hour.

Increase in Wages in Portland.—The Portland Railway, Light & Power Company, Portland, Ore., has granted an increase in pay to its trainmen and has agreed to allow for "deadhead" time. Details will be announced shortly.

Surface Contact System Reappears.—In the basement of a large building in Allentown, Pa., a working model of the surface contact system has been rigged up for public demonstration. It is reported that a stretch of road equipped with the system will be built in Allentown for demonstration purposes.

Progressives to Consider Municipal Ownership.—At a conference of Progressive leaders at Atlanta, Ga., on Feb. 14 plans were laid for the national conference of Progressives at St. Louis on April 12. Resolutions were adopted approving the speech of John M. Parker, New Orleans, the candidate for vice-president on the Progressive ticket at the recent national election, recommending that the St. Louis convention consider public ownership of public utilities.

Bill to Cut Commission Powers.—As an aftermath to the request of the Tacoma Railway & Power Company to the Washington State Public Service Commission to be relieved of certain obligations imposed by the ordinance under which it is operating, a bill has been introduced in the Legislature by Senator Johnson, Spokane, amending the Public Service Commission act so as to put it beyond the power of the commission to grant any such relief from the provision of any franchise, ordinance or law under which a public service corporation is operating.

Mr. Thompson to Report That Regulation Has Failed.—In a speech which he made on Feb. 10 Senator George F. Thompson, chairman of the Legislative committee which inquired into the workings of the Public Service Commissions in New York, said: "The committee is going to report to the Legislature that regulation of public utilities has failed, because the Public Service Commission has not the power to regulate them, and because the commission is compelled to perform inconsistent duties. Responsibility is not centralized in anybody."

Hamilton Strike Settled.—The strike of the employees of the Cincinnati, Dayton & Toledo Traction Company, Hamilton, Ohio, has been settled and the men have returned to work. The representatives of the men and Benton S. Oppenheimer, the receiver of the company, are to confer with the end in view of settling such differences as exist, with arbitration as the final recourse for the adjustment of any matters they are unable to dispose of by agreement between them. The final settlement, however, is to be subject to approval by the court having jurisdiction over the property.

Denver Company Advertises Among Its Own Men for Help.—I. M. Ristine, supervisor of employment of the Denver (Col.) Tramway, advertised as follows over his own name in *The Tramway Bulletin* for January, 1917: "Wanted—An Engineer: Mr. Kendall wants a man with engineering education or experience to work out the most economical schedule speed for each city car line, with the corresponding power consumption and per cent coasting. It is the policy of the Denver Tramway to make appointments from among present employees whenever the right man for the job can be found without going outside of the organization. Applicants please apply at Room 202." Mr. Kendall is efficiency and traffic engineer of the company.

Conference on San Francisco Tracks.—As a means of obviating the necessity for the construction of additional tracks on upper Market Street by the Municipal Railway, two compromise proposals were presented at a special meeting held in San Francisco, Cal., on Feb. 3 by the public utilities committee of the Board of Supervisors. One of these proposals was offered by Jesse W. Lilienthal, president of the United Railroads, and the other by M. M. O'Shaughnessy, city engineer of San Francisco. Both measures will afford direct transportation through the Twin Peaks Tunnel down Market Street over the tracks now in use. The committee took the matter under advisement and voted to lay the matter over for another week. No action was taken on the resolution proposed earlier in the week for the purchase of the United Railroads by the city.

Programs of Association Meetings

Central Electric Railway Association

The annual meeting of the Central Electric Railway Association will be held at the Claypool Hotel, Indianapolis, Ind., on March 8 and 9. The executive committee meeting will be on the evening of March 7. On the evening of March 8 the annual dinner and dance will be held. This promises to be a particularly interesting feature as the committee in charge has arranged for a number of new features.

New England Street Railway Club

The February meeting of the New England Street Railway Club will be "Maine Night." It will be held at the Copley Square Hotel, Boston, Mass., on Feb. 22. All arrangements for the meeting have been made by A. H. Ford, vice-president of the club and vice-president and general manager of the Cumberland County Power & Light Company, Portland, Me. Mr. Ford has been able to secure as speaker William T. Cobb, of Rockland, Me., former Governor of that State, of whom a brief biography is published elsewhere in this issue. His subject will be "Public Relations."

New York Electric Railway Association

The program for the twenty-second quarterly meeting of the New York Electric Railway Association, to be held at the Hotel Astor, New York, N. Y., on March 2, has been announced. The program of papers follows:

"Indemnity and Surety Bonds," by William N. Tomlins, Jr., vice-president and manager of the Metropolitan Department of the American Surety Company, New York.

"Redeemable Cash Fare Receipts," by R. W. Palmer, general manager of the Auburn & Syracuse Electric Railroad, Auburn, N. Y.

"Recent Tendencies in Taxation Matters," by R. L. Rand, vice-president of the Richmond Light & Railroad Company, New Brighton, N. Y.

Methods of discipline in the following departments will be discussed: (a) Ways and Structures, (b) Mechanical, (c) Power, (d) Transportation, (e) Office.

Instead of having a written question box, it is proposed to have delegates representing member companies present their troubles in person at the meeting with a view to exchanging ideas and receiving the benefits of the ideas of others, including representatives of the manufacturers.

The meeting will conclude with a formal dinner at the Hotel Astor at 7.30 o'clock, after which several prominent speakers will address the association. All requests for hotel accommodations should be made to the Hotel Astor. At this meeting a new policy, on the part of the association, will be inaugurated in that a charge of $5 will be made for each dinner ticket partially to defray the expense of the dinner and the meeting. Tables will be arranged to accommodate parties of eight. Places will be assigned in the order in which applications are received. A buffet luncheon will be served during the progress of the meeting.

Financial and Corporate

Annual Reports

Chicago City & Connecting Railways Collateral Trust

The annual report of the Chicago City & Connecting Railways Collateral Trust, Chicago, Ill., for the calendar year 1916 shows a net income increase of $279,223 or about 50 per cent over 1915. This gain was secured through a rise of $285,505 or 15 per cent in gross income and an increase of only $6,282 or 0.5 per cent in total disbursements. The surplus, however, because of a larger dividend on the participation shares, was less than half that at the end of the preceding year. Dividends at the rate of $3.25 per share were paid on the 250,000 preferred participation shares outstanding as compared with $2 in 1915.

The increase in disbursements was brought about by increased taxes in spite of lower interest charges and less general expense. The taxes increased $17,279, or about 200 per cent, on account of the federal tax on net income. This item increased this year, and in addition, the new law raised the rate from 1 to 2 per cent. In 1913 and 1914 the trust paid no taxes at all, because the counsel for it believed that it was not subject to taxes, and this was substantiated by the Government in a minor decision. Later the Government reversed its decision, and the trust has been paying the taxes since, although suit is now pending for their recovery.

The income statement for the last two years follows:

	1916	1915
Dividends	$1,979,750	$1,704,352
Interest	91,256	88,855
Other income	29,662	21,956
Gross income	$2,100,668	$1,815,163
Interest on bonds	$1,087,208	$1,094,750
Bond redemption	105,000	105,000
Interest on bills payable	24,908	24,784
General expense	20,978	24,557
Taxes	26,052	8,773
Total disbursements	$1,264,146	$1,257,864
Net income	$836,522	$557,299
Dividends on participation shares	812,500	500,000
Surplus income	$24,022	$57,299

York Railways

Although there was an extraordinary increase of $59,134 or 12.4 per cent in the operating costs of the York (Pa.) Railways during the fiscal year ended Nov. 30, 1916, as compared to the preceding one, this was more than met by the gain of $139,196 or 16.8 per cent in gross earnings. The 1916 totals were $967,496 and $537,248 respectively.

The so-called "operating expenses" totaled $445,946, an increase of 8.4 per cent, while the allowances for depreciation amounted to $40,541, a rise of 96 per cent, and taxes to $50,760, an increase of 10 per cent. In spite of these, however, the net earnings at $430,248 showed an increase of $80,062 or 22.8 per cent. The gain was reduced somewhat by an increase of $19,601 or 8.1 per cent in interest and bond discount, but the net income totaled $171,172, a gain of $60,460 or 54 per cent. After the payment of $100,000 in dividends and certain small adjustments the surplus on Nov. 30, 1916, amounted to $208,323. As noted in the ELECTRIC RAILWAY JOURNAL of Jan. 6, the company has declared 2½ per cent of deferred dividends on its preferred stock.

The expenditures charged to cost of property during the year for the railway department were $2,936 for additional track and $31,919 for new cars and equipment. The total capital expenditures, covering the lighting and heating divisions as well, were $136,499.

The York Railways was incorporated under the laws of Pennsylvania in 1907 and controls all the local lines in York and also owns practically the entire stock of the Edison Light & Power Company, York. The total track operated is 84.46 miles, of which 25.79 miles are in York.

Merger Planned in Spokane

Washington Water Power and Inland Empire Lines in Tacoma Involved

After nearly fourteen years of competition the Washington Water Power Company and the Inland Empire Railroad are trying to arrange for the consolidation of their local lines in Spokane for their mutual benefit. The city of Spokane looks favorably upon the plan, particularly as it seems likely to result in corporation ownership with municipal control.

The move toward consolidation comes as the result of a recent opinion handed down by the Public Service Commission forbidding the abandonment of owl cars as a measure of economy and requiring the companies to obtain the consent of the commission to the use of one-man cars. As noted in the ELECTRIC RAILWAY JOURNAL of Jan. 27, page 184, the commission actually suggested the merger plan as a substitute. Attorneys for the companies acted at once upon the suggestion and a bill providing for the consolidation or lease of the properties is before the Legislature.

At many places in Spokane the tracks of the two systems are needlessly close to one another and four of the main lines of the Washington Water Power Company parallel those of the Inland Empire System for more than twenty blocks at a distance apart of never more than three streets. In one instance the two companies use the same track for a distance of nearly half a mile.

The Washington Water Power Company was first to adopt the pay-as-you-enter cars, and soon after the advent of the jitney it introduced the one-man car Opposition developed at once to the one-man car, and the commission, in the decision referred to previously, held that the companies should in the future submit to it for approval lists of routes of their respective lines upon which they desired to operate such cars and that the cars should be approved by the commission before they were placed in service.

The pay-as-you-enter car as operated in Spokane has been approved by the public, and the prejudice against the one-man car is fast disappearing. It is not uncommon, however, on account of the multiplicity of service, for cars on such lines as the one running to Fort Wright, to make the entire trip to the city with a single passenger after the evening rush hour. Small branch lines are run across certain sections of the city connecting remote districts with the main lines which go to the downtown section, and these never handle traffic which one-man cars could not easily carry. It is on such lines that the single employee system was first worked out and the plan has been developed until it is used on all lines of the Washington Water Power Company now except during rush hours, when a conductor stands in the front vestibule with the motorman to collect fares.

In referring to the bill placed before the Legislature by the company attorneys, C. S. MacCalla, general manager of the Washington Water Power Company, said:

"No one can say at this time what we will do if this bill is passed, but even if we wanted to we could not carry out the suggestion of the Public Service Commission without a law of this kind. Districts that now have two lines operating on ten-minute schedules could be served just as well by cars on one line running every five minutes. Both of the present systems could be operated from one power plant. It has been figured that an amalgamation would mean a saving of 20 per cent in trackage and 25 per cent in operating expense."

As for the jitney, which has gained a strong foothold in Spokane, that form of transportation would seem likely from the course that events are taking to be confronted soon with a consolidation of the existing street railways, a keener fight than ever for patronage and possible municipal intervention through probable participation by the city in the management of the street railways.

The Spokane & Inland Empire Railroad operates 45 miles of track in Spokane through its ownership of the Spokane Traction Company. The Washington Water Power Company operates in Spokane through its ownership of the Spokane Street Railway, the Spokane Cable Railway, the Spokane Electric Railway, the Ross Park Street Railway and the City Transit Company. In all, the company owns and operates 112 miles of street and interurban railway.

$3,500,000 Deal Completed

Control of Ironwood and Bessemer Properties Passes to L. E. Myers

L. E. Myers of the L. Myers Company, contractors, Chicago, Ill., has purchased the Ironwood & Bessemer Railway & Light Company, Ironwood, Mich., including the Gogebic & Iron Counties Railway & Light Company, the Ashland Light, Power & Street Railway, Ashland, Wis., the Ashland Power Company, Hurley (Wis.) Water Company, and Ironwood Water Works Company. The Big Falls, Tylers Fork, Brownstone Falls, Copper Falls and Superior Falls power developments on the Montreal, Flambeau and Tylers Fork Rivers are also included in the transfer. On the completion of the power development work that is now under way these properties will comprise about 40,000 hp. in water power and steam auxiliaries. About 9000 hp. in steam plants is under construction. The consideration involved in the sale was about $3,500,000. L. E. Myers has been elected president of the several companies and L. N. Bosen of the Myers Company has been elected vice-president. The present local managements will be continued.

Chicago Agreement Continued

The three-year operating agreement entered into by the Chicago Railways and the Chicago City Railway in January, 1914, to form the Chicago Surface Lines as the operating company, was renewed at a meeting held on Feb. 7, for another three-year period. The following members of the board of operation were re-elected: Henry A. Blair, Charles C. Adsit, Wallace Heckman and John M. Roach, representing the Chicago Railways, and Leonard A. Busby, H. B. Riley and F. O. Wetmore, representing the Chicago City Railway. Mr. Blair was re-elected chairman of the board and Mr. Busby, president. F. D. Hoffmann was re-elected secretary and assistant treasurer; M. B. Orde, treasurer; Frank L. Hupp, assistant secretary; John J. Duck, general auditor, and W. W. Gurley, general counsel.

Empire United Reorganization

Formal Plan Not Announced—Unofficial Statements Indicate Segregation of Properties

The formal plan of reorganization of the Empire United Railways, Inc., Syracuse, N. Y., has not been announced. Unofficial statements in regard to the proposed plan indicate, however, a readjustment of the finances of two of the constituent companies without sale at receivership, and their consolidation into a new company, and the segregation of the property of the Rochester, Syracuse & Eastern Railroad.

The new company to take over the Syracuse, Lake Shore & Northern Railroad and the Auburn & Northern Railroad will, it is said, be financed and managed by Ford, Bacon & Davis, New York, N. Y. This company will likely be capitalized on the basis of $500,000 of authorized three-year 6 per cent notes, $1,000,000 of authorized Series A 6 per cent cumulative preferred stock, $1,250,000 of authorized Series B 6 per cent non-cumulative preferred stock and $1,500,000 of authorized common stock. Of these securities there will be issued at this time all of the authorized Series B preferred stock and all of the common stock, but only $350,000 of the three-year notes and $200,000 of the Series A preferred stock. The basis of the distribution of these securities has not been indicated, nor has any statement been made as to how under the plan as so far developed the holders of the preferred and common stocks of the Empire United Railways would participate.

The following statement is credited to James M. Gilbert, chairman of the protective committee of bondholders of the Syracuse, Lake Shore & Northern Railroad.

"A proposition was submitted to us by the committee representing the bondholders of the Empire United Railways, which contemplates the payment in full of the unpaid interest upon the bonds of the Syracuse, Lake Shore & Northern Railroad, together with the foreclosure expenses and the expenses of this committee.

"The plan further provides for the discontinuance of the pending foreclosure proceeding and the discharge of the receivers appointed therein, and the continuance of the bonds of the Syracuse, Lake Shore & Northern Railroad as a first lien on the property covered by the mortgage securing them.

"As this plan puts these bondholders in precisely the position they would have been in if there had been no default in payment of interest, and this at no expense to them, and also provides the road with sufficient cash to take care of its capital requirements, thus greatly improving the value of the security for these bonds, we do not see how, in justice to the bondholders whom we represent, that we could refuse consent."

Brooklyn (N. Y.) Rapid Transit Company.—Eleven of the subsidiary companies of the Brooklyn Rapid Transit Company held annual meetings during the week ended Feb. 3. In the Coney Island & Gravesend Railroad directorate, Howard Abel, comptroller of the Brooklyn Rapid Transit Company, was elected to succeed J. F. Calderwood, who resigned some time ago as vice-president and general manager of the Brooklyn Rapid Transit Company. The directors of the other companies were all re-elected.

Gary, Hobart & Eastern Traction Company, Hobart, Ind.—The court has ordered the sale of the property of the Gary, Hobart & Eastern Traction Company, which has been in the hands of Judge O. L. Wildermuth as receiver.

Georgia Railway & Power Company, Atlanta, Ga.—G. W. Brine has been elected a director of the Georgia Railway & Power Company to succeed Asa G. Candler, who resigned from the company before taking the office of Mayor.

Haytian-American Corporation, New York, N. Y.—P. W. Chapman & Company, Breed, Elliott & Harrison, Lawrence Turnure & Company and Hartshorne & Battelle, New York, N. Y., are offering for subscription at 100 and accrued dividend $5,500,000 of 7 per cent cumulative convertible preferred stock of the Haytian-American Corporation, owning and operating railroad, public utilities and sugar properties in the Republic of Hayti. The preferred shares will be accompanied by 25 per cent in common shares and 50 per cent in founders' shares.

Laurel Light & Railway Company, Laurel, Miss.—H. N. Whitney & Sons are offering at 100 and interest the unsold portion of their block of $150,000 of 6 per cent first-mortgage gold bonds of the Laurel Light & Railway Company. The bonds are dated Dec. 12, 1911, and are due July 1, 1936. The bonds are a first mortgage on all of the street railway property acquired since organization and also a lien on the light and power property in Laurel, subject only to $80,000 of bonds of the Laurel Electric Power & Light Company which cover only the original electric light property in Laurel. Eighty thousand dollars of the bonds of the Laurel Light & Railway Company are reserved to retire the bonds of the Laurel Electric Power & Light Company. With the issuance of $12,000 of additional bonds of the Laurel Light & Railway Company, for additional property, the mortgage will be closed. The Fidelity Trust Company, New York, N. Y., is trustee under the mortgage given to secure the bonds.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—The annual meeting of the stockholders of the Milwaukee Electric Railway & Light Company will be held at the office of the company in Milwaukee, on Feb. 21, for the purpose of electing three directors to fill the vacancies caused by the expiration of the term of office of the directors of the third class; "to consider and take action upon the proposition of purchasing the properties and franchises of other utilities," and for the transaction of other business.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—An application has been filed with the California Railroad Commission by the Oakland, Antioch & Eastern Railway for authority to issue five one-day 5 per cent notes of a par value of $18,000 each, in forms similar to a note at the present time held by the Union Trust Company, San Francisco, for $90,000, which is dated Oct. 31, 1915, payable in one day and bearing interest at 6 per cent. The five notes are to be secured by bonds now securing the note to the Trust Company, the total of the bonds being $150,000. The $90,000 note is indorsed by John I. Walter, H. C. Breeden, W. Arnstein, S. Naphtalis and Henry T. Scott. It is proposed that these indorsers pay this $90,000 note and take the five notes for that total amount.

Ottawa (Ont.) Traction Company.—At the annual meeting of the Ottawa Traction Company, A. J. Dawes, Montreal, was elected to the board to fill a vacancy, and former officers were re-elected.

Pine Bluff (Ark.) Company.—The controlling interest in the Pine Bluff Company has passed from Ford, Bacon & Davis interests to W. S. Robeneck, Thornton; H. C. Couch, Arkadelphia; Charles S. McCain, Little Rock; J. H. Meek, Fordyce, and J. L. Longine, Arkadelphia. Among the representatives of Ford, Bacon & Davis, New York, N. Y., on the board of directors of the company, was William von Phul, now vice-president and general manager of the United Railroads, San Francisco, Cal. The property of the company consists of approximately 9½ miles of electric railway, an electric light and power plant, water pumping station and reservoirs, with complete distribution system for both electric and water departments.

Pittsburgh & Butler Railway, Pittsburgh, Pa.—The property of the Pittsburgh & Butler Railway is advertised to be sold under foreclosure at Pittsburgh on May 9. The company was placed in the hands of the Pittsburgh Trust Company on Jan. 2, 1917, as receiver, as noted in the ELECTRIC RAILWAY JOURNAL of Jan. 6, page 53.

Public Utilities Company, Evansville, Ind.—The Public Utilities Company has assumed the property of the Evansville Public Service Company and is now operating the city street railway lines, the interurban line to Princeton, Ind., and the local electric lighting and gas plants, having received the sanction of the Indiana Public Service Commission to the merger.

Quebec Railway, Light & Power Company, Quebec, Que.—Justice Cassils at Ottawa on Jan. 24 handed down an opinion regarding the valuation of the Quebec & Saguenay Railway and other properties of the Quebec Railway, Light & Power Company which the Dominion Government is proposing to buy. The press reports of the finding indicated that the court inclined to the opinion that total deductions which would aggregate several million dollars should be made from the cost of the roads. A statement made in behalf of the company said that there was no ground for the interpretation of the decision as a conclusive decision adverse to the company's contentions. As a matter of fact, the deliverance is viewed by the company as favorable in the sense that all ambiguity or doubt as to the intentions of the Government in regard to the purchase must now be removed.

Salt Lake, Garfield & Western Railway, Salt Lake City, Utah.—C. F. Childs & Company, Chicago, Ill., and New York, N. Y., are offering at price to yield 5.75 per cent $300,000 of first mortgage 6 per cent gold bonds of the Salt Lake, Garfield & Western Railway dated Sept. 1, 1916, and due serially from 1919 to 1941. The company is the successor to the Salt Lake & Los Angeles Railroad, 17 miles long. The proceeds of the issue will be spent to extend the line from Saltair to Garfield, 3 miles; to electrify the entire system; to equip the road with new and modern electric rolling stock. Any residue will be applied to liquidating indebtedness. The plans for electrification were reviewed briefly in the ELECTRIC RAILWAY JOURNAL of Feb. 10, page 263.

Sandpoint & Interurban Railway, Ltd., Sandpoint, Idaho.—At a recent meeting of the stockholders of the Sandpoint & Interurban Railway, Ltd., the directors were instructed to accept the offer made by Albert Filson, president and manager of the company, of $13,000 for the entire holdings of the company, with the exception of the office building at Main and Second Avenues, which is occupied as a depot. The holdings include 6 miles of track, five electric cars and other equipment.

Sandusky, Norwalk & Mansfield Electric Railway, Norwalk, Ohio.—The report prepared by the expert appointed by the court to inquire into the financial affairs of the Sandusky, Norwalk & Mansfield Electric Railway is reported to be ready for presentation to Judge John M. Killits of the District Court of the United States for the Northern District of Ohio at Toledo. A hearing will be held soon after the report is submitted, and it is expected that the details will all be arranged so that the property can be offered for sale under foreclosure by April 15. It is anticipated that the upset price will be fixed at $275,000. The road was placed in operation in 1905. In 1911 it was placed in the hands of Wilbur Hoyt, C. P. Brooks and George B. Dusenberry as receivers on the application of the holders of the $600,000 of first mortgage bonds, the interest on which was in default. On Nov. 6, 1912, C. G. Taylor was appointed receiver of the company. The company has outstanding $360,000 of common stock, $240,000 of non-cumulative preferred stock, and $600,000 of first mortgage bonds. It operates 22 miles of track between Norwalk and Plymouth, built over private right-of-way except in cities, where the franchises run for twenty-five years from 1904. On July 1, 1913, the Plymouth & Shelby Traction Company, controlled by the Sandusky, Norwalk & Mansfield Electric Railway and operating 9 miles of track, was released from the receivership.

San Jose (Cal.) Railroads.—The California Railroad Commission has issued an order dismissing the application of the San Jose Railroads for authority to buy $50,000 of San Jose & Alum Rock Railway bonds and $200,000 of San Jose & Santa Clara Railroad bonds and to refund this $250,000 of bonds by issuing to the Southern Pacific Company $250,000 of San Jose & Santa Clara County Railroad bonds. The commission held that permission from it in this instance was unnecessary.

Slate Belt Electric Street Railway, Pen Argyl, Pa.—A. H. MacAdams, J. H. Scholl, Murtha Quinn and George F. Hayes, Philadelphia, have been elected directors of the Slate Belt Electric Street Railway to succeed Milton Flory and Charles N. Miller, Bangor; E. A. Speer, Pen Argyl, and John A. Miller, Nazareth. Mr. MacAdams has been elected president of the company to succeed C. H. Latta. Mr. Schneebeli, who has been secretary and treasurer, continues as secretary, but Thomas J. Ryan, Philadelphia, becomes treasurer of the company.

Stroudsburg (Pa.) Passenger Railway.—The Stroudsburg Passenger Railway has been purchased by the same interests that control the Stroudsburg, Water Gap & Portland Railway. The property will be transferred on April 1. The Stroudsburg Passenger Railway operates 2.5 miles of line connecting Stroudsburg and East Stroudsburg. The Stroudsburg, Water Gap & Portland Railway operates 10 miles of line connecting Stroudsburg, Delaware Water Gap and Portland.

Tacoma (Wash.) Municipal Railway.—According to a report made by Controller Fred Shoemaker to Mayor A. V. Fawcett, Tacoma, the 1-mile municipal railway operated under lease by the Tacoma Railway & Power Company, after running into a deficit of $3,912 during the year 1915, shows a profit for 1916 of $962. The gain appears after deducting 4 per cent for the cost of construction paid the city and 5 per cent interest on the investment allowed the Tacoma Railway & Power Company. The agreement under which the line is run provides that the profits shall be divided equally between the city and the company. Before there can be any such division, however, the 1915 deficit must be charged off.

Tidewater Southern Railway, Stockton, Cal.—The Western Pacific Railroad has filed with the California Railroad Commission an application for authority to buy 1,201,000 shares of the capital stock of the Tidewater Southern Railway in order to extend the Tidewater lines and to develop its freight and passenger traffic so that the interchange between the Western Pacific and the Tidewater company may be increased. The Tidewater lines extend from Stockton and Modesto to Turlock, and connect with the Western Pacific at Stockton. Last October the Tidewater company applied to the commission for authority to make a new entrance into Stockton by using the tracks of the Western Pacific Railroad to the crossing of the Santa Fé line, and thence into Stockton by the Stockton Electric Railway. The Tidewater company also asked for permission to extend its line from Hatch, Stanislaus County, to Erwin City, Merced County, 8 miles. A hearing was held upon the new Stockton entrance, but a decision has not yet been made.

Tulsa (Okla.) Traction Company.—The Tulsa Traction Company has filed an amendment to its charter at Oklahoma City, changing its name to the Oklahoma Union Railway, and increasing its capital from $100,000 to $600,000.

Dividends Declared

Central Arkansas Railway & Light Corporation, Hot Springs, Ark., quarterly, 1¾ per cent, preferred.

Detroit (Mich.) United Railway, quarterly, 1¾ per cent.

Tampa (Fla.) Electric Company, quarterly, 2½ per cent.

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$73,741	*$41,805	$31,936	$18,654	$13,282
1 " "	'15	67,306	*34,478	32,828	17,606	15,222
12 " "	'16	829,988	*460,877	369,111	214,916	154,195
12 " "	'15	788,832	*400,510	388,322	212,495	175,827

CENTRAL MISSISSIPPI VALLEY ELECTRIC PROPERTIES, KEOKUK, IOWA.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$26,954	*$17,959	$8,995	$2,072	$6,923
1 " "	'15	26,237	*15,489	10,748	1,897	8,851
12 " "	'16	294,893	*197,994	96,899	23,827	73,072
12 " "	15	282,177	*187,512	94,665	22,455	72,210

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$110,760	*$88,869	$21,891	$30,159	†$8,268
1 " "	'15	105,343	*63,836	41,507	29,784	11,723
12 " "	'16	1,235,623	*823,444	412,179	356,324	55,855
12 " "	'15	1,087,344	*727,731	359,613	357,762	1,851

COLUMBUS (GA.) ELECTRIC COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$84,383	*$30,166	$54,217	$28,527	$25,690
1 " "	'15	70,226	*26,866	43,360	28,679	14,681
12 " "	'16	881,353	*351,233	530,120	343,574	186,546
12 " "	'16	721,217	*322,040	399,177	344,544	54,633

DALLAS (TEX.) ELECTRIC COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$198,746	*$103,197	$95,549	$40,919	$54,630
1 " "	'15	168,163	*101,577	66,586	35,861	‡31,925
12 " "	'16	1,990,420	*1,207,612	782,808	451,887	‡349,064
12 " "	'15	1,828,488	*1,120,174	708,314	404,561	‡304,953

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$296,312	*$184,854	$111,458	$63,749	$47,709
1 " "	'15	238,667	*141,274	97,393	62,982	34,411
12 " "	'16	3,027,699	*1,820,774	1,206,925	755,033	451,892
12 " "	'15	2,466,969	*1,473,592	993,377	756,315	237,062

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$75,471	*$39,710	$35,761	$9,625	$26,136
1 " "	'15	69,453	*35,373	34,080	9,172	24,908
12 " "	'16	826,313	*444,422	381,891	107,698	274,193
12 " "	'15	723,091	*386,447	336,644	105,562	231,082

EL PASO (TEX.) ELECTRIC COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$117,342	*$59,202	$58,140	$5,335	$52,805
1 " "	'15	101,469	*46,508	54,961	4,180	50,781
12 " "	'16	1,110,717	*658,564	452,153	59,127	393,026
12 " "	'15	981,888	*521,059	460,829	50,368	410,461

KEY WEST (FLA.) ELECTRIC COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$11,708	*$7,226	$4,482	$2,525	$1,957
1 " "	'15	9,504	*6,619	2,885	2,559	326
12 " "	'16	116,371	*77,547	38,824	30,219	8,605
12 " "	'15	112,840	*82,040	30,800	30,595	205

NEW YORK & STAMFORD RAILWAY, PORTCHESTER, N. Y.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$25,295	*$24,709	$586	$7,987	‡†$7,366
1 " "	'15	23,649	*24,166	†517	7,994	‡†8,472
6 " "	'16	189,564	*152,315	37,249	47,923	‡†10,371
6 " "	'15	210,310	*159,500	50,810	47,998	‡3,166

PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$28,281	*$20,659	$7,622	$7,268	$354
1 " "	'15	28,944	*15,691	13,253	7,438	5,815
12 " "	'16	310,962	$213,600	97,362	86,676	10,686
12 " "	'15	289,155	$179,025	110,130	91,269	18,861

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$788,880	*$443,296	$345,584	$184,923	$160,661
1 " "	'15	699,702	*414,999	284,703	182,417	102,286
12 " "	'16	8,107,371	*5,120,995	2 986,376	2,212,982	773,394
12 " "	'15	7,559,582	*4,754,763	2,804,819	2,179,984	624,835

SAVANNAH (GA.) ELECTRIC COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$80,096	*$49,649	$30,447	$23,986	$6,461
1 " "	'15	68,902	*44,271	24,631	23,329	1,302
12 " "	'16	826,093	*553,695	272,398	282,756	†10,358
12 " "	'15	794,213	*518,488	275,725	278,491	†2,766

WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'16	$14,763	$16,249	†$1,486	$2,018	‡†$3,480
1 " "	'15	17,513	20,514	†3,001	1,723	‡†4,692
6 " "	'16	107,199	115,022	†7,823	11,473	‡†19 138
6 " "	'15	133,742	129,734	4,008	9,840	‡†5,648

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* Includes taxes. † Deficit. ‡ Includes non-operating income.

Traffic and Transportation

Indianapolis Traffic Increasing

1916 Interurban Passenger and Freight Traffic Handled at Indianapolis Traction Terminal Offsets 1915 Decrease

The following tables compiled by the Indianapolis Traction & Terminal Company, relating to the interurban passenger and freight traffic handled through the traction terminal station at Indianapolis, show an increase of almost 600,000 passengers carried during the year 1916 as compared with 1915. The year 1915, however, did not show the usual increase, due to business depression, as will be noted from the table showing the comparison for the several years but the business developed during the year 1916 more than offset this decrease. In order to estimate the number of visitors brought to the city of Indianapolis by the interurban lines, it is considered, theoretically, that each person makes a round trip, and on this basis the total number of people who visited Indianapolis by the electric lines in 1916 would be one-half of the total passengers carried, or 3,604,274, an increase of nearly 100,000 over the year 1914. The total of 7,208,747 passengers handled by the interurban lines entering the city of Indianapolis during the year 1916 is more than twice the population of the State of Indiana, which is approximately 3,000,000. The number of passengers entering and leaving Indianapolis every two weeks is more than equal to the total population of the city of Indianapolis, which is about 260,000.

DATES WHEN INTERURBAN LINES COMMENCED OPERATING INTO INDIANAPOLIS

Indianapolis, Columbus & Southern Traction Company	Jan. 1, 1900
T. H. I. & E.—Eastern Division	June 17, 1900
Union Traction Company—Muncie Division	Jan. 1, 1901
T. H. I. & E.—Martinsville Division	Aug. 2, 1902
T. H. I. & E.—Brazil Division	Sept. 15, 1902
Indianapolis & Cincinnati—Shelbyville Division	Sept. 12, 1902
T. H. I. & E.—Northwestern Division	Oct. 9, 1903
Union Traction Company—Logansport Division	Dec. 3, 1903
Indianapolis & Cincinnati—Rushville Division	July, 1905
T. H. I. & E.—Danville Division	Sept. 1, 1906
T. H. I. & E.—Crawfordsville Division	July 4, 1907
Union Traction Company—Newcastle Division	June 29, 1910
Beech Grove Traction Company	March, 1911

The total number of passengers carried since 1900 was as follows: 1900, 377,761; 1901, 955,554; 1902, 1,523,411; 1903, 2,347,936; 1904, 3,274,654; 1905, 3,881,382; 1906, 4,469,982; 1907, 5,032,677; 1908, 4,979,371; 1909, 5.156,906; 1910, 5,736,272; 1911, 6,279,822; 1912, 6,431,714; 1913, 6,524,366; 1914, 7,012,763; 1915, 6,629,642; 1916, 7,208,747.

INDIANAPOLIS TRACTION & TERMINAL COMPANY—TOTAL NUMBER INTERURBAN AND SUBURBAN PASSENGERS ARRIVING AND DEPARTING—INDIANAPOLIS

Month	Passengers, 1916	Passengers, 1915	Month	Passengers, 1916	Passengers, 1915
January	459,614	473,428	October	600.015	582,016
February	467,910	462,977	November	590,609	514,255
March	533,200	508,172	December	638,126	511,771
April	542,183	520,528			
May	643,625	622,531	Total	7,208,747	6,629,642
June	642,151	580,984			
July	767,669	629,694			
August	692,166	624,891	Average per day	19,696	18,163
September	631,479	598,395			

INDIANAPOLIS TRACTION & TERMINAL COMPANY—TOTAL NUMBER INTERURBAN AND SUBURBAN CARS ARRIVING AND DEPARTING—INDIANAPOLIS

	1916			1915		
Month	Passenger Cars	Freight Cars	Total	Passenger Cars	Freight Cars	Total
January	19.260	1,987	21,247	19,494	2,112	21,606
February	18,049	1,890	19,939	17,977	1,962	19,939
March	19,947	2,217	22,164	19,865	2,213	22,078
April	19,644	2,071	21,715	19,806	2,151	21,957
May	22,048	2,120	24,168	23,039	2,117	25,156
June	22,630	2,215	24,845	22,137	2,196	24,333
July	25,033	2,290	27,323	23,616	2,183	25,799
August	23,735	2,375	26,110	23,577	2,210	25,787
September	21,631	2,191	23,822	22,211	2,084	24,295
October	20,912	2,318	23,230	20,396	2,156	22,552
November	19,967	2,157	22,124	19,470	2,042	21,512
December	21,173	2,149	23.322	19,915	2,085	22,000
Total	254,029	25,980	280,009	251,503	25,511	277,014
Average per day	694	71	765	689	70	759

Hearing on Seven-Cent Fares

Small Massachusetts Road Seeks to Establish This Unit Instead of Present Five-Cent Rate

An appeal for the establishment of a 7-cent fare unit on the Norwood, Canton & Sharon Street Railway was heard by the Public Service Commission of Massachusetts recently at Boston. The company was represented by Robert Holt, of Gaston, Snow & Saltonstall, Boston. The road is only 6.25 miles long. It consists of two disconnected parts separated by the Blue Hill Street Railway. The company is managed by the Norfolk & Bristol Street Railway at an expense of $200 a year and it purchases electricity from the Blue Hill company at the rate of 2.75 cents per kilowatt-hour. The present management began the operation of the road in 1913 and in the three years following a net divisible income of $2,000 was realized. This, however, was wiped out in 1916 and there was a deficit of more than $5,000 in the latter year. The present fare unit is 5 cents. Only two cars are required to maintain hourly service on the company's lines.

Mr. Holt said that the northerly section of the road was located wholly in the town of Norwood, service being rendered from Norwood Center to Canton. This section of the road is operated by platform men employed by the Blue Hill Street Railway, which pays the company 1½ cents per car-mile for the use of the car on that portion of its tracks between Washington Street, Canton, and the Norwood, Canton & Sharon tracks extending into Norwood. The Blue Hill company pays these platform men for the time that they are on its tracks. Only four men are required for this service and each road meets about half their compensation. The southerly section of the road is about 3.3 miles long. It is wholly in Sharon, and service is rendered between Sharon Heights and the Canton-Sharon town line. There are no through cars running into Canton and no transfers are issued to the Blue Hill cars. The road has one carhouse, located at the Sharon end, and the Blue Hill company cares for the rolling stock maintenance. The operating revenue of the company in 1916 was $10,875 and the operating expenses were $14,735. Last year the company ran 68,094 revenue car-miles. The operating revenue per car-mile was 15.97 cents, the lowest in Massachusetts. The passengers per car-mile averaged 3.2 compared with 5.9 for all companies in the State, and the total revenue passengers carried was 217,474. The average operating revenue per car-mile for all companies in Massachusetts in 1916 was 30.75 cents. The company proposes to sell tickets in strips of ten for 65 cents and sixteen for $1. Mr. Holt pointed out that it had been impossible to maintain the track properly with the revenue received. It is estimated that the establishment of a 7-cent fare unit, if all the present patronage is retained, will increase the company's income by $3,233 a year. Following the presentation of the company's case, J. A. Halloran, for the selectmen of Norwood, stated that the town authorities are not in opposition to the establishment of the 7-cent fare unit, even though the rate may exceed that in and about Norwood on other street railway lines. One-man cars are to be considered for the road according to M. A. Cavanaugh, general manager of the Norfolk & Bristol Street Railway.

Bus Line Privilege Not a Franchise

The municipal consent to the operation of stage lines within a city required by the laws of New York is not a franchise in the sense of the clause of the second class cities law, requiring that franchises must be disposed of at public auction, according to a decision recently made by the Public Service Commission of New York, Second District, in the matter of the application of the Troy Auto Car Company, Inc., for a certificate to operate a bus line in the city of Troy, N. Y. The phrase "public convenience and necessity," according to the opinion, is to be taken as an entirety. It is not necessary, as a precedent to the granting of a certificate, that the commission should find that the proposed stage line is strictly a necessity as well as a convenience. Public convenience and necessity exists when the proposed facility will meet a reasonable want of the public and supply a need, if existing facilities, while in a sense sufficient, do not adequately supply that need.

Buffalo Receives Billy Sunday

International Railway Handles Promptly Thousands Who Hit the Salvationist's Sawdust Trail

Special service has been provided by the International Railway, Buffalo, N. Y., for the crowds which are attending the Billy Sunday revival services at the tabernacle on the grounds of the Buffalo International League baseball park. J. W. Andrews, former superintendent of the Buffalo & Lockport and Lockport & Olcott divisions of the International Railway, has been assigned to the special duty of directing the street car movement to and from the tabernacle. He is assisted by a corps of uniformed supervisors and trainmen. The baseball park is located within two short blocks of the Cold Spring station of the International Railway and car tracks are on three sides of the big frame tabernacle, which has a seating capacity for 14,500 persons. Five car lines pass the structure and the South Park-West Utica line is routed around the baseball park before and after the services. Cars for all lines are parked on dead tracks on the Masten Street side of the building for the accommodation of the tabernacle crowds after the meetings. All chartered and special interurban cars start from the Cold Spring station, two short blocks from the park.

A system of electric signals similar to that adopted at the Kansas City revival is used by Superintendent Andrews for starting the cars after each service. An electric signal from the desk of George Sunday, Billy Sunday's business manager, in the tabernacle to Mr. Andrew's office in the rear of the building gives the superintendent advance information as to when each meeting will end. At Mr. Andrews' station in the tabernacle there are electric signals connected with large gongs at Michigan and East Ferry Streets, at Main and East Ferry Streets and at the Cold Spring station. By a code of signals Mr. Andrews starts the cars to keep pace with the movement of the crowds. He also receives ample advance notice of any changes in the arrangements at any meeting. A special telephone connects the tabernacle with the superintendent of the Cold Springs carhouse.

The rapidity with which the crowds have been handled during the first two weeks of Mr. Sunday's campaign has been favorably commented upon by Mr. Sunday and the newspapers. At the evening services almost 14,000 persons have been loaded into cars and the streets cleared of traffic within fifteen minutes. A squad of policemen is co-operating with the railway in directing the movement of the crowds.

Substitute Petition Presented

Bay State Street Railway Files New Schedule of Fares for Nashua, N. H.

The Bay State Street Railway, Boston, Mass., has withdrawn its original petition for a general increase of fares in Nashua, N. H., from 5 to 6 cents and including the changing of various Nashua-Hudson fare limits, and substituted a new detail of fare increase and transfer changes as follows:

Five-cent cash fare raised to 6 cents including fares on cars operated by agreement with Manchester Street Railway.

Sale of nine tickets for 50 cents, good only within Nashua transfer limits as modified.

Withdrawal of all reduced-rate tickets except school tickets sold at one-half regular rates.

Changes in local transfer privileges.

Nashua-State Line Route No. 111. Local transfer limit Stewarts corner changed to the junction of county and Pelham roads, a reduction in length of ride of 2.88 miles; distance from transfer station, Nashua, 2.46 miles.

Changes in fare collection points:

Nashua-State Line Route No. 111.—Fare-collection point established at the junction of county and Pelham roads, Hudson, making an additional fare zone between end of route Palm Street, Nashua, and Stewarts corner, Hudson; also between end of route and New Hampshire-Massachusetts State line, distance from end of route 3.04 miles, reducing length of ride 2.88 miles; length of zone 2.88 miles.

The Public Service Commission of New Hampshire has suspended the prophesied new schedule until April 1 pending the investigation which it proposes to conduct into the matter.

Safety Program Adopted

Commission, Electric Railways and Auto Association Agree Upon Final Program, Including Legislation

A final program, including legislation to be asked for this year, for greater safety at the grade crossings of highways and electric railways was adopted at the offices of the Public Service Commission for the Second District of New York at Albany on Feb. 14 by the conference which the commission has been engaged in for nearly a year with representatives of the electric railways and the automobile clubs of the State.

The program includes the endowment of the commission with power to order the obstructions to vision at these grade crossings removed and the expense apportioned equitably among the State, municipality and the railway, the equipment of all crossings with standard signs and warnings lighted at night and the erection of a standard sign at a distance of 500 ft. from the crossing on the highway, a requirement that all whistles or other signals on electric cars be sounded up to the time the car or train reaches the crossing, that motorists be compelled to approach crossings with their cars so under control that they can bring them to a stop before crossing, that all vehicles be compelled to carry light showing in all directions, and that the work of the committee to encourage education and publicity against the dangers at these crossings be continued.

The executive committee of the conference, of which Seymour Van Santvoord of the commission is chairman, will take charge of the presentation of these conclusions, with suitable bills, to the Legislature.

Among those at the meeting on Feb. 14 were H. B. Weatherwax, of the Hudson Valley Railway; H. A. Bullock, of the Brooklyn Rapid Transit Company; H. A. Abell, of the Schenectady Railway; M. D. Kilbride, of the New York State Railways; C. B. Hammond, of the Elmira, Corning & Waverly Traction Company; A. W. Seaman, of the New York State Automobile Association; C. L. Addison, of the Long Island Railroad; W. H. Collins, of the Fonda, Johnstown & Gloversville Railroad; I. M. Beatty, of the Peekskill Light & Railroad Company; William O. Wood, of the New York & Queens County Railway, and James P. Barnes, general manager of the Buffalo, Lockport & Rochester Railway.

P. A. Y. E. for Denver.—The Denver (Col.) Tramway is preparing to install the center-entrance P-A-Y-E on its entire system. The first car of this type in Denver was placed in service on Jan. 29.

Traffic Survey in Flint, Mich.—B. J. Arnold has been engaged to make a traffic survey by the city authorities of Flint, Mich. The problem includes a study of steam railroad terminals, street railway traffic and entrance for interurban lines. The street railway lines in Flint are operated by the Detroit United Railway.

City Regulation for Intra-Urban Jitneys.—The Texas Highway Commission bill, which provides for the levying of a tax on all motor vehicles and placing them under State supervision, has been amended by a clause specifically providing that cities and towns in the State of Texas shall have authority to regulate jitneys that operate within their limits.

Skip-Stop Proposed for Norfolk.—The Virginia Railway & Power Company has decided to use the skip-stop system in Norfolk, if permitted to do so by the City Council. A survey is being made of the entire territory in which the skip-stop system will be in effect in that city and the proposition will be brought to the attention of the Council as soon as all of the data needed have been completed by the company.

West Penn Magazine Revived.—The West Penn Railways, Pittsburgh, Pa., in response to repeated requests, have resumed for their employees the publication of the *West Penn Bulletin*. The last number was issued in the latter part of 1914, the general business depression existing at that time requiring its sacrifice in the interests of economy. The first copy of this resumed monthly magazine is dated October, 1916.

California Jitneys Asked to Report to State.—The Railroad Commission of California complying with the recent decision of the Supreme Court of that State placing jitney buses under its jurisdiction, has sent to nearly 1000 freight and passenger and stage lines in the State blank forms for their filing with the commission schedules of rates, fares, classifications, time schedules, routes, rules and regulations.

Kentucky Company Courts Industrials.—The Owensboro (Ky.) City Railroad is co-operating with the city's business interests in its efforts to bring new industries to the city and hold them there. In connection with the establishment of a new chair factory some distance out, the company is repairing an old track laid to a convenient point and will replace a trolley wire, probably also constructing a waiting station at the end of the line. Cars will run to the terminus in the morning and in the evening to haul the employees whose homes are in the city.

Rise in Dallas Valuations.—Valuations of public utilities in Dallas, Tex., recently submitted to the City Commission, show an average increase of 111 per cent over the valuations of 1916. The street car properties east of the Trinity River, or those in the city of Dallas proper, are valued at $8,500,000, the valuation agreed on in the reorganization plan of the city and the Strickland-Hobson interests. The property of the Northern Texas Traction Company, including the Oak Cliff lines, was valued at $1,684,000, an increase of 95 per cent over the 1916 valuation.

Bids Opened for Municipal Railway Buses.—Five bids for motor buses for use in the transportation of passengers in conjunction with the Municipal Railway System of San Francisco, Cal., were opened on Jan. 31 by the Board of Public Works. The lowest of these bids is as follows: Furnishing and delivering complete, $4,375; maintenance for 125,000 miles, $1,875; turn in allowance (chassis), 125,000 miles, $500; weight of bus, complete without load, 6800 lb.; rated power, S. A. E., 28.8; wheelbase, 172 in.; length of chassis, overall, 20 ft. 6 in.; rated capacity of chassis, 6000 lb.

A Sermon Around a Commission Decision.—The Puget Sound Traction, Light & Power Company, Seattle, Wash., has republished in *Electrogram*, circulated by it among the public, extracts of the decision of the Public Service Commission of that State in the Spokane traffic case with comment of its own on the decision. This is the decision in which the commission said that if no relief were found for the conditions in Spokane the inevitable would happen, namely, "the trolley will come down and the rails will come up." This decision was referred to at length in the ELECTRIC RAILWAY JOURNAL for Jan. 27, page 184.

Portland Company Simplifies Its Transfers.—The Portland Railway, Light & Power Company, Portland, Ore., has recently issued new transfers, which are somewhat simpler than the former style, in that the little "P. M." coupon has been eliminated and hereafter a transfer issued between noon and midnight will be punched, but not between midnight and noon. The line from which the transfer is issued is indicated by the initials of that line, instead of by color of the transfer, as heretofore. The cost of the new transfers will represent a slight saving over the old type. This railway company issues approximately 60,000 transfers a day, or about 22,000,000 a year.

Interborough Traffic Sets New Records.—Planned for a daily capacity of 600,000 persons, the average subway riding of the Interborough Rapid Transit Company has risen steadily to 1,541,832, the record set on Dec. 18. On that day also the elevated system of the same company reached its high-water mark of 1,252,063. Another record was broken in the travel during the week before Christmas. Figures for the seven days were more than 2,295,000 greater than for the Christmas week of the previous year. From 1,069,000 in September, 1916, the daily average of passengers on the subway has mounted steadily higher. In November it was 1,199,000 and December traffic reached 1,246,563.

I. T. S. Employees Render Vote of Confidence.—The employees of the Chicago, Ottawa & Peoria Railway Company, a subsidiary of the Illinois Traction System, have given the officials of the road a unanimous vote of confidence. This action followed a long discussion of the wage question. The satisfactory settlement of the problem, with the unanimous vote of confidence, is indicative of the cordial relations which now prevail between the men and the officials of this company. According to the agreement the first and second year men are allowed 2½-cent increase per hour while all those who have been employed by the company for two years will receive a flat increase of 4 cents an hour.

Louisville Semaphore Accident Involves Traffic Problems.—Special consideration at a date to be selected has been ordered by the Jefferson Circuit Court at Louisville, Ky., of the question as to whether the city, in maintaining semaphores at certain street intersections, has a right to use semaphores the arms of which are on a level with the windows of the street cars. The order is in connection with the trial of a suit involving injuries to a child which stuck its head out the window and suffered a gash in the head when it came in contact with the semaphore. Both the city and the Louisville Railway are defendants in the case, and both contend that it was the duty of the father to prevent the child from sticking his head out of the window even though it was open.

Safety Film Available.—Realizing the value and success of the motion pictures "The Price of Thoughtlessness" and "The Cost of Carelessness," both of which are particularly adapted for public safety work and the training of transportation department employees, the railway by which they were developed has consented to allow the pictures to be distributed through the National Safety Council by Scott & Van Altena, Inc., New York, N. Y., and the pictures can now be procured by any company or civic organization conducting or desiring to conduct safety or educational work. The consent was necessary, as both the motion pictures and stereopticon slides are copyrighted. The scenes portray actual incidents and accidents that may and do occur every day and are in every way true to life. The highly dramatic features of the motion picture of the present day have been eliminated, and nothing is left but those features which may be desired to make safety and educational endeavor a thorough and lasting success.

Buffalo Advertising Brings Results. — The International Railway, Buffalo, N. Y., is continuing its campaign of newspaper advertising. As stated previously in the ELECTRIC RAILWAY JOURNAL the cars of the company were placarded with posters asking for constructive criticism. As a result many valuable suggestions have been received and a number so made have already been adopted. Others are being considered for future use. In one of the first of the series of advertisements E. G. Connette, president of the company, replied to the complaint regarding the matter of heat. Another display advertisement of the company set forth its reasons for turning back cars before they reached their destination. Other advertisements have told about the company's constructive policy in making improvements and about the causes of irregularities in service. The company published every day a list of all delays of more than ten minutes' duration, giving the cause of the delay, the lines affected and the time. In its recent advertisement dealing with expenditures the company said that during the last five years it had spent $8,869,067 for new construction, reconstruction of tracks, paving of tracks, rolling stock, etc. These expenditures were tabulated by years. The figures were commented on favorably in an editorial in a recent issue of the *Courier*, the largest morning paper in Buffalo. Several of the other Buffalo daily newspapers have also commented favorably, in editorials which have appeared in recent issues, on the company's policy of taking the public into its confidence.

Personal Mention

S. W. Haberle has succeeded J. H. Morris as chief dispatcher in the Illinois Traction System.

P. P. Griffin has been elected vice-president of the Susquehanna Traction Company, Lock Haven, Pa.

W. E. Skead has been appointed city purchasing agent of the Brandon (Manitoba) Municipal Railway.

C. D. Smythe has been appointed commercial agent of the Joplin & Pittsburg Railway, Pittsburg, Kan.

B. F. Yeakee has been appointed electrical engineer of the Glendale & Montrose Railway, Glendale, Cal.

R. B. Campbell has been elected secretary of the Arkansas Valley Interurban Railway, Wichita, Kan.

B. C. Long has been appointed master mechanic of the Muskogee (Okla.) Electric Traction Company.

James Wilson has been elected treasurer of the Shawinigan Falls Terminal Railway, Montreal, Quebec.

H. G. Budden has been elected secretary of the Shawinigan Falls Terminal Railway, Montreal, Quebec.

Mary A. Landon has been elected president of the Woodstock & Sycamore Traction Company, Genoa, Ill.

R. B. Shields has been appointed chief power station engineer of the Wheeling (W. Va.) Traction Company.

J. A. Werner has been elected first vice-president of the Chicago, Aurora & De Kalb Railroad, Aurora, Ill.

W. E. Page has been appointed engineer overhead construction of the Sand Springs Railway, Tulsa, Okla.

J. H. Schuch has been appointed chief engineer of the Butte, Anaconda & Pacific Railway, Anaconda, Mont.

Roy Carmien has been appointed local purchasing agent Alaska Gastineau Mining Company, Thane, Alaska.

E. W. Shell has been elected treasurer of the Trans-St. Mary's Traction Company, Sault Ste. Marie, Ontario.

G. C. Starkweather has been appointed superintendent of the Hoboken Manufacturers' Railroad, Hoboken, N. J.

H. E. Cox has been appointed chief engineer Birmingham Railway, Light & Power Company, Birmingham, Ala.

I. W. Ross has been appointed general manager Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala.

E. L. King has been appointed general manager of the Lee County Central Electric Railway, Lee Center, Ill.

W. F. Fetherolf has been appointed general freight agent of the Lehigh Valley Transit Company, Allentown, Pa.

J. M. Mellor has been appointed master mechanic of the Northern Massachusetts Street Railway, Athol, Mass.

L. E. Rader has been appointed chief power station engineer of the Warren (Pa.) Street Railway, at Stoneham, Pa.

A. Keller has been appointed chief power station engineer of the Warren & Jamestown Street Railway, at Stoneham, Pa.

Charles Krial has been appointed roadmaster of the Philadelphia & Easton Electric Railway, with office at Revere, Pa.

H. H. Wood has been made assistant to the general superintendent of the Central Illinois Public Service Company, Mattoon, Ill.

R. D. Jones has been appointed claim agent for the Reading Transit & Light Company, Reading, Pa., succeeding Rex D. Billings.

B. J. Arnold of Chicago has been commissioned as major of engineers in the Officers' Reserve Corps of the Army of the United States.

C. S. Head has been appointed superintendent of maintenance of way of the Indiana Railways & Light Company, Kokomo, Ind., to succeed G. H. Losey.

W. J. Ginnivan has resigned as manager and purchasing agent of the railway department of the Montgomery Light & Traction Company, Montgomery, Ala.

H. F. Dicke, for five years general manager of the Boise Valley Traction Company, Boise, Idaho, has been appointed as general manager of the Utah Light & Traction Company, Salt Lake City, Utah, succeeding H. L. Beach.

Mrs. Melodia Blackmar Jones was elected president of the Niagara Gorge Railway, Buffalo, N. Y., at the annual meeting of directors on Feb. 2. Mrs. Jones succeeds her husband, the late Capt. Joseph T. Jones. The Niagara Gorge Railway owns and operates the Great Gorge Route from Lewiston to Niagara Falls, N. Y., along the American gorge of the Niagara River.

R. D. Voshall has been appointed superintendent of equipment of the Birmingham Railway Light & Power Company, Birmingham, Ala., to succeed R. A. Riley. For the past eight years Mr. Voshall has been connected with the Tidewater Power Company, Wilmington, N. C., for five years as master mechanic and for three years in charge of the railway department. Previously he served with the New York (N. Y.) Railways and the Illinois Traction System.

W. F. M. Goss, dean of the College of Engineering, University of Illinois, has been elected president of the Railway Car Manufacturing Association of New York, and will take up his new work as soon as released. Mr. Goss was dean of engineering at Purdue University from 1879 to 1907, when he went to Illinois. He was employed as chief engineer by the Chicago Association of Commerce in 1915 to prepare a report on smoke abatement and railway terminal electrification in Chicago.

Ward Hubbard, formerly chief engineer of the Rockford & Interurban Railway, Rockford, Ill., has resigned to become engineer of maintenance of way of the Bay State Street Railway, Boston, Mass. He entered the employ of the Union Traction Company, Anderson, Ind., in 1903 as a rodman, and was employed in that company until 1911, serving successively as timekeeper, foreman, chief clerk and division engineer. In 1911 he became chief engineer of the Rockford & Interurban Railway, coming to Boston to take up his present work Feb. 1, 1917.

Thomas Dreier has been appointed assistant to the president of the Bay State Street Railway, Boston, Mass. Mr. Dreier has been engaged in editorial work for about twelve years. For more than two years he was editor of *Associated Advertising*, the official magazine of the Associated Advertising Clubs of the World, and in the interests of better advertising has spoken before commercial organizations in nearly all the large cities of the country. He is the author of several books and is a frequent contributor to magazines. Mr. Dreier is to be the principal speaker at the meeting of the Massachusetts Street Railway Association at Youngs Hotel, Boston, Feb. 21.

H. L. Beach, general manager Utah Light & Traction Company, Salt Lake City, Utah, has tendered his resignation and will be transferred to the east by the interests controlling that property. Mr. Beach assumed the management of the Utah Light & Traction Company, which has 145 miles of track and 184 motor cars, about two years ago. Before going to Utah Mr. Beach had been associated for a short time with B. J. Arnold and previous to that for a long time was with the transportation department of the Chicago Railways Company, now a part of the Chicago Surface Lines. The Salt Lake *Herald-Republican*, in commenting on his resignation, says in a recent issue that his departure will be deeply regretted by the public. It adds that to operate a public utility to the entire satisfaction of its patrons is among those achievements commonly regarded as impossible, but that the public in Salt Lake City will be content if the service in the future will be as satisfactory as it has been in the past.

William T. Cobb, Rockland, Me., who as noted elsewhere, will address the members of the New England Street Railway Club at Boston on Feb. 22 on the subject "Public Relations," is unusually well fitted to discuss this subject from every possible viewpoint. He is a graduate of Bowdoin College, Brunswick, Me., Heidelberg University and the Harvard University Law School and is a member of the Maine Bar Association. About twenty years ago Mr. Cobb assisted in building the Rockland, Thomaston & Camden Street Railway and has been its president for many years. He was Governor of the State of Maine for four years, from 1904 to 1907, inclusive. He was one of the receivers of the Eastern Steamship Corporation, is a trustee of Bowdoin College and is president of the Maine Railways Light & Power Company, the Androscoggin Electric Company, the Oxford Electric Company and the Rockland, Thomaston & Camden Street Railway, besides being a director of several banking and financial institutions.

W. D. RAY

W. D. Ray, for the last two years vice-president and general manager of the Pennsylvania Utilities Company, Easton, Pa., which was recently sold by the Barstow interests, has tendered his resignation, effective April 1. Prior to coming to Easton, Mr. Ray was for four years vice-president and general manager of the Northern Indiana Gas & Electric properties operating in Hammond, Michigan City and other Indiana cities, and before that he served three years as commercial agent for the Sanitary District of Chicago. Mr. Ray's early years were spent as electrical engineer for several railroads in the Chicago territory, and later he became designing engineer for the old Standard Electric Company. During the Chicago World's Fair, Mr. Ray was connected with the Exposition's electrical department. At this period he collaborated with C. K. MacFadden in the book, "The Practical Application of Dynamo-Electric Machinery," a little volume which has appeared in many reprintings. From 1894 to 1897 he was superintendent of the Everett (Wash.) Electric Railway, returning to Chicago to handle electric-motor sales for the Lorain Steel Company. Later Mr. Ray had charge of the complete construction of two 75-mile electric railways in Michigan, and of the Grand Rapids-Muskegon third-rail road. During the past two years Mr. Ray has been in charge of the Pennsylvania Utilities Company, which furnishes electricity, gas and electric-railway service to a community of 100,000 people in Easton and neighboring towns.

Obituary

John Hickey, mechanical engineer of the Salt Lake & Utah Railroad, Salt Lake City, Utah, died on Feb. 3.

John J. Linden, one of the oldest employees on the Chicago (Ill.) Surface Lines, died on Jan. 17. He started with the company as a conductor thirty years ago and later became night foreman and superintendent. He was for many years general superintendent of the old Chicago Consolidated Traction Company. Later he went to Washington to become general manager of the Seattle, Renton & Southern Railway Company, but returned to Chicago about five years ago to take up his old work as superintendent at the North Side Lincoln station. At the time of his death he was on an indefinite furlough, owing to ill health.

Capt. R. S. Satterlee, vice-president of the Habirshaw Electric Cable Company, and ordnance officer on the staff of Major-General O'Ryan, National Guard, New York, is dead as the result of exposure connected with military duty. Captain Satterlee served in the Spanish War and later was appointed by Governor Roosevelt a first lieutenant in the Twelfth New York Regiment, and went to Cuba with that command and served in the Army of Occupation. On his return here he joined the Habirshaw Wire Company, of which he became president in 1911. Upon the reorganization of the company into the Habirshaw Electric Cable Company, Captain Satterlee became vice-president.

Legal Notes

Charters, Ordinances, Franchises

CALIFORNIA.—*Validity of Collateral Agreement as to Note.*

Where a stock subscription contract was executed in duplicate, the subscriber retaining one copy on which the corporation's agent indorsed an agreement to return the subscriber's note for his subscription if he were dissatisfied, and the corporation, within that time, before any stock was issued to him, refused to return the note upon being requested, the note was not enforceable against the subscriber by another party with notice of these facts, although the agent had not indorsed the agreement on the original subscription contract, filed with the company. The corporation had been fully organized before this subscription was made, and it did not appear that any subsequent creditor or later subscriber had been defrauded by reliance upon this subscription, or that this subscriber connived at or contemplated any secrecy in making the collateral agreement permitting cancellation, or that he knew that the corporation's agent failed to indorse the agreement upon the original subscription retained for the corporation files, whatever secrecy there was about the agreement being imparted to it by the corporation through its agent. (Tidewater Southern Ry. v. Vance, 160 Pacific Rep., 1097.)

GEORGIA.—*Assessments for Public Improvements.*

A street railway company which owns a 30-ft. right-of-way on the side of a street in a municipality is not exempt from assessment for a sanitary sewer in the street on which it abuts, on the ground that the railway company cannot receive any benefit from the improvement so long as its property is subjected to the present particular use. The case does not represent that class of assessment which the courts are warranted in preventing as representing "a manifest abuse of legislative authority." (Georgia Railway & Electric Co. v. City of Atlanta, 87 Southeastern Rep. 1058.)

IOWA.—*Right-of-way—Fee or Easement—Paving Charges.*

Where owners of land conveyed to a railway by deeds reading that they sold and quitclaimed to the road all their right, title, and interest in the land, not merely in the right-of-way, though each deed embodied a statement that the land was to be used for the construction and operation of a street railroad and that if in the future the land should be abandoned for such purpose it should revert to the grantor or the public, the road received a fee in the land. Hence a paving assessment against it could not be avoided on the theory that its interest in the land was merely an easement, since where an estate is conveyed subject only to a possibility of reverter, the grantee is the owner until the reverter takes place. (Des Moines City Railway v. City of Des Moines, 159 Northwestern Rep., 450.)

Liability for Negligence

INDIANA.—*Killing Stock—Presumption—Negligence.*

Negligence on the part of a street railway cannot be presumed from the mere fact that live stock is injured or killed by its car at a point where the statute does not require its tracks to be fenced. (Terre Haute, Indianapolis & Eastern Traction Co. v. Krause et al., 109 Northeastern Rep., 760.)

INDIANA.—*Duty to Passenger a Continuing One Until He Reaches Destination.*

Where a passenger on an interurban car informed the conductor that he wished to be put off at stop 32, but the conductor negligently carried him by such stop to stop 34, the railroad's duty of using a reasonable degree of care for his safety as a passenger by furnishing transportation or by instructing as to the way and dangers, continued until he walked back to stop 32, since the relation of carrier and passenger, once established, continues until terminated by the passenger, or by the act of the carrier under circumstances justifying its termination, while the act of the railroad in putting decedent off at the wrong place did not so justify termination. (Terre Haute, Indianapolis & Eastern Traction Co. v. Hunter, 111 Northeastern Rep., 344.)

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Central Jersey Traction Company, Keyport, N. J.**—Incorporated to operate an electric railway. Capital stock, $900,000. Incorporators: Francis A. Carter, James F. Shrader and Logan B. Gill, all of Philadelphia.

***Harney Valley Railroad, Portland, Ore.**—Incorporated under the laws of Washington, to construct either a steam or electric railway from Bend, Ore., to Klamath Falls and San Francisco, via Burns. Capital stock, $25,000. H. H. Parker and Isaac D. Hunt, vice-president, Ladd & Tilton Bank, Portland, Ore., are interested.

Portland, Vancouver & Northern Railway, Vancouver, Wash.—Supplemental articles of incorporation were recently filed with the Secretary of State by Henry Crass and C. W. Ford to change the name of the Portland, Vancouver & Northern Railway to the Pacific Coast Railway. The corporation was formed about two years ago and at that time it was understood the intentions were to build a line into Portland, crossing the Interstate bridge over the Columbia River, between Vancouver, Wash., and Portland, Ore.; also to construct interurban lines in Clarke County, Washington. About that time the jitneys became an uncontrollable factor in the transportation business and the financial conditions became stringent. Now that money is seeking investment the promoters are putting the corporation in shape, looking toward early activities. The company holds a franchise to cross the military reservation at Vancouver. Headquarters will be established in Portland. Henry Crass will be chief counsel and C. W. Ford will look after active construction and operation. [Dec. 16, '16.]

FRANCHISES

St. Augustine, Fla.—The Jacksonville & St. Augustine Public Service Corporation has received a year's extension of time on its franchise to construct a line from Jacksonville to St. Augustine. The contract for constructing the line has been awarded to Stephenson Sons Company, Inc., New Haven, Conn. Grading has been completed on 7½ miles of line and 3½ miles of track have been laid. T. R. Osmond, St. Augustine, general manager. [Sept. 9, '16.]

Evanston, Ill.—The Evanston West Side Railway has asked the Public Utilities Commission of Illinois for a certificate of convenience and necessity to construct 7 miles of electric railway on Asbury Avenue, Wesley Avenue, Howard, Main and Davis Streets, Evanston. It is stated that the Evanston West Side Railway is controlled by the officials of the Evanston Railway Company. [Dec. 4, '15.]

Fairfield, Iowa.—The Iowa Railway & Light Company has received a franchise from the City Council to supply electricity in Fairfield.

Portland, Ore.—The Portland Railway, Light & Power Company has received from the City Council a six months' extension of time on its franchise to construct an extension on Morrison Street from Chapman to Washington Street.

Juniata, Pa.—The Altoona & Logan Valley Electric Railway has asked the Borough Council of Juniata for a franchise to construct an extension on Fourth Avenue.

TRACK AND ROADWAY

Edmonton (Alta.) Power Company, Ltd.—It is reported that the Edmonton Power Company is making surveys for the construction of an 80 mile railway from Edmonton to its new power plant site. Work on the construction of the power plant will be begun as soon as the railway is completed, which, it is estimated, will take about a year. E. W. Bowness, engineer. [May 27, '16.]

Glendale & Montrose Railway, Glendale, Cal.—It is reported that work will be begun about March 1 by this company on the construction of an extension from Los Angeles Avenue, Glendale, to Tujunga.

Municipal Railways of San Francisco, San Francisco, Cal.—The contract for furnishing electric conduit and splicing materials for the Municipal Railway in Twin Peaks Tunnel has been awarded to the Standard Underground Cable Company, Pittsburgh, Pa., at $32,128.

Connecticut Company, New Haven, Conn.—It has been officially announced that the Connecticut Company has decided to discontinue interurban service between Church Corner, East Hartford, and Rockville, and double its trolley service over street lines from Hartford to Rockville, owing to the hazard of a combined electric and steam service over the main line tracks of the New York, New Haven & Hartford Railroad between Burnside and Vernon. In place of the discontinued service, the company will maintain a half-hourly trolley service, instead of an hourly service, between Tolland Avenue, Rockville, and the old City Hall, Hartford.

Hartford & Springfield Street Railway, Warehouse Point, Conn.—This company will construct an extension of its tracks in Enfield.

Pocatello Traction & Interurban Company, Pocatello, Idaho.—It is reported that the Pocatello Traction & Interurban Traction Company has increased its capitalization to $2,000,000, and contemplates the expenditure of $1,500,000 on projected lines. C. G. Haynes, Blackfoot, is interested. [Nov. 18, '16.]

Decatur Railway & Light Company, Decatur, Ill.—It is reported that the Decatur Railway & Light Company plans to construct an extension of its Riverside line from the corner of East Wood and South Webster Streets east on Wood Street to Nelson Park, 1¼ miles.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—Establishment of cross-town car service in the southern and western parts of the city, extension of two car lines and several minor changes have been ordered by the Board of Public Works on recommendation of City Engineer B. J. T. Jeup. The recommended route for the cross-town line is along Virginia Avenue from Fountain Square to South Street, along South Street to Kentucky Avenue and along Kentucky Avenue to Stock Street. New track will be needed between Virginia Avenue and Pennsylvania Street. The city will pay $3,500 of the $21,000 cost of the tracks and the county will pay $1,500. Other changes in car service ordered by the Board is the reconstruction of a loop at Riverside Park, construction of double tracks in West Michigan Street from Holmes Avenue to Tibbs Avenue; removal of tracks on Forty-eighth Street and Pennsylvania Street east; extension of the Meridian Heights car line from Forty-eighth to Fiftieth Streets; extension of the Illinois Street line from Thirty-ninth to Forty-sixth Streets with double tracks, and the construction of turnouts on the Brookside Avenue line, from Eighteenth to Olney Streets.

***New Orleans, La.**—It is reported that the construction of an electric railway from New Orleans to Milneburg is being contemplated. The Elysian Field Avenue Commission, W. W. Fisk, secretary, is reported interested.

Bay State Street Railway, Boston, Mass.—The Bay State Street Railway has asked the Waterways Commission for authority to construct the Pleasant Street bridge over the Taunton River between Dighton and Somerset at Broad Cove. The company desires to construct a trestle sufficiently wide for two street railway tracks.

Detroit (Mich.) United Railway.—A new street car line along the Ford Highway, in a district north of Detroit which is rapidly developing, will be built by the Detroit United Railway. The company has purchased trackage owned by the Michigan Railway in the city of Flint and will extend city service over the line, this district formerly being served only by interurban cars.

Rahway Valley Company, Summit, N. J.—Electrification of the Rahway Valley Company, Summit to Boyden Avenue, Hilton, has been practically completed and consents of property owners in Boyden Avenue are being solicited for the building and operation of a trolley line through that thoroughfare by the company. Negotiations have been begun with Public Service Railway to connect the line, when completed through Boyden Avenue, with its tracks at Springfield Avenue, Hilton. If a traffic handling agreement can be reached with Public Service Railway cars of the Rahway Valley Company will operate from Summit into the Public Service Terminal in Park Place, Newark, and the route of the Morris County Traction Company will be paralleled.

Brooklyn (N. Y.) Rapid Transit Company.—Only one proffer was made when the Public Service Commission for the First District of New York last week opened bids for the relocation of the surface railroad tracks in New Utrecht Avenue, Brooklyn, between Thirty-ninth and Eighty-first Streets. That offer was made by Charles Meads & Company, New York City, and the amount of the bid was $230,000. The surface tracks in question were formerly utilized for the operation of the trains of the West End line on the surface of New Utrecht Avenue. An elevated railroad structure has been constructed under the dual system contracts, upon which the elevated trains now operate, making unnecessary longer the utilization of the surface tracks for train operation. All rights of the Nassau Electric Railroad Company are preserved except that it agrees not to operate either steam or electric trains upon the surface and to use the tracks only for trolley operation.

***New York, N. Y.**—The Bronx Board of Improvement has been incorporated with a capital stock of $600 for the purpose of having surveys made for the construction of a double-track electric railway. The route selected will tap a territory in the extreme northern section of the city, and will follow a general easterly-northeasterly direction, beginning at the Spuyten Duyvil station of the New York Central Railroad on the Hudson River, extending along the Harlem River ship canal to Tibbet Creek, to West 238th Street, to Bailey Avenue, to Gun Hill Road to Pelham Parkway, to City Island, approximately 9 miles. It is estimated the project will cost about $1,000,000. The Bronx Board of Improvement will petition the Public Service Commission to establish the road, requesting them to direct an existing railroad to build the line. In the event that it cannot be accomplished in this way a separate company is to be organized to build it independently. Florence J. Sullivan, 27 Cedar Street; Edward S. Schwartz, and H. E. Becker are the directors of the Bronx Board of Improvement.

Scioto Valley Traction Company, Columbus, Ohio.—Plans are being made by the Scioto Valley Traction Company to improve its lines from Lockbourne to Main Street, Columbus, about 11 miles.

East Liverpool Traction & Light Company, East Liverpool, Ohio.—A 1½-mile extension of its Pleasant Heights line is being considered by the East Liverpool Traction & Light Company. The old rails and ties now used on the present line north of the West End fire station will be replaced by new T-rail. This improvement will involve an expenditure of several thousand dollars.

Youngstown & Southern Railway, Youngstown, Ohio.—Work will be begun in the spring by the Youngstown & Southern Railway on the construction of an extension to East Palestine.

Mahoning Valley Railway, Youngstown, Ohio.—This company has received permission from the Youngstown & Southern Railway to use its tracks from East Woodland and South Avenue, over the South Avenue bridge and on Front Street to Champion Street, thereby enabling the Mahoning Valley Railway to route its Poland Avenue cars into the city in this way.

Kansas-Oklahoma Electric Company, Caney, Okla.—A contract has been awarded by this company to Stephenson Sons & Company, Inc., New Haven, Conn., which has sublet to the Railroad Construction Company, New York, N. Y., for the construction of a line from Wichita, Kan., to Fort Smith, Ark., 165 miles. S. M. Porter, Caney, president. [Jan. 15, '16.]

Tulsa (Okla.) Traction Company.—Announcement has been made by the Tulsa Traction Company that extensions will be built from Tulsa in several directions. The line to Bixby will be extended to Muskogee, to Okmulgee, thence to Nowata via Collinsville and Oolagah. A line will also be built from Tulsa to Sapulpa. A plan is being developed for building a system of lines connecting the various oil field towns, forming a belt line having terminals in the city of Tulsa.

Northampton Traction Company, Easton, Pa.—This company plans to construct an extension to College Hill.

Lehigh Valley Railroad, Philadelphia, Pa.—Electrification of portions of the Lehigh Valley Railroad is in contemplation as referred to in the current issue of the ELECTRIC RAILWAY JOURNAL, page 314.

Pennsylvania Railroad, Philadelphia, Pa.—It has been announced that the branch line of the Pennsylvania Railroad from Seward to Gallitzin will be electrified, the same system as on the Paoli line to be used.

Carolina Rapid Transit Company, Clinton, S. C.—A report on the construction of this company's proposed line from Spartanburg to Clinton was recently submitted by Reid Tull, chief engineer. The proposed roadbed is to be of standard cross-section. All bridges and culverts are to be of concrete, cast iron and steel. Except in a few instances it is proposed to use wooden frame trestles which are to be filled in when the road has been in operation for several years. The main line track is to consist of 80-lb. open-hearth standard section steel rails laid on first class crossties and each rail joint bonded with copper bonds equal in cross-sectional area to the trolley wire. Side tracks are to be laid with smaller sections of second-hand steel rail on second-class crossties. The overhead construction is to be of catenary type using 7-16 messenger wire and No. 0000 copper trolley and feeder wire, placing poles 150 ft. on tangents and 105 ft. on curves, using wooden cross-irons for feeders, and message wires and steel arms for messenger and trolley wire support. It is proposed to build three carhouses, one at Spartanburg, one at Union and at either Laurens or Clinton, also two substations, one located at or near Glenn Springs and one at Cross Anchor. The equipment is estimated on using three 60-ton electric locomotives for freight service and six three-compartment interurban passenger cars equipped with motors for passenger service; also two cabooses, six flat cars and six lever cars for use in freight and maintenance service. [Nov. 25, '16.]

Corpus Christi (Tex.) Traction Company.—This company, which plans to construct a line from Corpus Christi to Ward Island, has abandoned its plan to build a loop line on Water, South Second and other streets in Corpus Christi and will build only to its terminal station. The franchise will be amended accordingly. J. H. Caswell, Corpus Christi, general manager. [June 17. '16.]

Dallas (Tex.) Northwestern Traction Company.—E. P. Turner, Dallas, president of the Dallas Northwestern Traction Company, which proposes to build an interurban line from Dallas northwestward to Slidell, approximately 58 miles, announces that he has closed an underwriting contract for bonds sufficient to build and equip the line. The first order for equipment will call for not less than sixteen standard-size passenger cars. Much of the right-of-way has already been secured, and it is announced that the construction company will be ready to begin work as soon as the rest of the right-of-way is available. [Jan. 13, '17.]

***Port Orchard, Wash.**—T. B. Kidd, representing Tacoma, Wash., capitalists, is promoting the construction of an electric interurban, from Port Orchard through the Burley Valley to Gig Harbor, connecting with Tacoma by a large ferry to Point Defiance. Mr. Kidd has asked the commercial bodies of the towns in the vicinity of Port Orchard to take up the matter, and the county commissioners of Pierce County, Tacoma, have requested that a committee from the commercial clubs meet with them, to take up the matter of a ferry to be jointly owned and maintained by Pierce and Kitsap counties. The proposition is also made to turn the line over to the counties at its actual cost of construction, if the counties desire to assume control.

Tacoma Railway & Power Company, Tacoma, Wash.—The city of Tacoma and the Todd Shipbuilding & Repair Company of that city have started negotiations looking toward the extension of the Tideflats carline from its present terminus to the location on the tideflats, where the Todd Shipbuilding & Repair Company is erecting new shipyards. If the extension is made, it will be operated on virtually the same joint contract that the present tideflats line is being operated or the Tacoma Railway & Power Company will make a proposition to the city of Tacoma for the purchase of the present municipal line over the tideflats and construct and operate the extension as a part of its present system. The present municipal line is operated under an agreement with the city by the Tacoma Railway & Power Company.

SHOPS AND BUILDINGS

Detroit (Mich.) United Railway.—This company has recently purchased a block of property at Fort and Fifteenth Streets as a site for a new west side freight depot. The company's present freight house property at Sixth and Congress Streets will be turned over to the Pennsylvania Railroad.

Valley Railways, Lemoyne, Pa.—Tentative plans have been made by the Valley Railways for the construction of a terminal station along River Street, Harrisburg, extending from Walnut Street to Strawberry Street, and the double-tracking of Walnut Street between Front and River Streets to relieve the traffic congestion in Market Square.

POWER HOUSES AND SUBSTATIONS

Commonwealth Power, Railway & Light Company, Grand Rapids, Mich.—The City Council of Mason is considering a proposal submitted by the Commonwealth Power, Railway & Light Company to take over the municipal distribution system and lighting business for $15,000. An election will soon be called to submit to the voters the proposal as to whether the proposition of the company shall be accepted or a new plant installed.

Columbus Railway, Light & Power Company, Columbus, Miss.—A new 1000-hp. steam turbine is being installed by the Columbus Railway, Light & Power Company, doubling the capacity of its plant.

Lincoln (Neb.) Traction Company.—This company has leased its power plant to the Commonwealth Power Company of Lincoln and has entered into a contract with the power company to purchase energy to operate its system for a period of forty-nine years. The Commonwealth Power Company contemplates the construction of dams and power stations on the Blue River to furnish power for the local traction system and the interurban line to the city of Omaha.

Interborough Rapid Transit Company, New York, N. Y.—This company has recently purchased the property at 77 and 79 Murray Street, and will construct a two-story and basement building for joint use by the Brooklyn Rapid Transit Company and the Interborough Rapid Transit Company as a substation for the operation of the new subway lines and the present elevated roads.

Cleveland (Ohio) Railway.—The Council of the City of Cleveland has adopted a resolution authorizing the Cleveland Railway to expend $300,000 for a new substation.

Youngstown & Sharon Street Railway, Youngstown, Ohio.—This company will construct an electric plant in Youngstown.

Portland Railway, Light & Power Company, Portland, Ore.—Preparations are being made by the Portland Railway, Light & Power Company to furnish additional electric power to the Southern Pacific Company for the operation of its trains over the electrified railway from Whiteson to Corvallis. The transmission line from the power station on the Clackamas River to Salem is under construction from Mount Angel southwesterly, so it may carry higher voltage current and larger facilities for distribution of power from Salem are being provided. The total expenditure will be between $50,000 and $60,000.

Rhode Island Company, Providence, R. I.—A new substation will soon be built at Harmony by the Rhode Island Company.

Manufactures and Markets

Discussions of Industrial Conditions
A Department for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Business Announcements Trade Literature

$2,000,000 for Cars in Boston

President Brush Outlines Plans of Company for Immediate Improvements if Legislature Permits—He Also Reviews Expenditures of Past Six Years

Extensive plans for new equipment were announced in Boston this week by President Matthew C. Brush of the Boston Elevated Railway. They are contingent upon the passage by the Legislature of a bill authorizing the company to issue temporary bonds or use the proceeds of the sale of the Cambridge subway temporarily to purchase more cars and equipment. The passage of such a bill was recommended by the commission appointed to investigate the financial condition of the company. The amount which it is proposed thus to expend for new cars is more than $2,000,000. In discussing these plans President Brush reviewed what the company had done in the recent past in the way of new equipment. He said in part:

"On Aug. 31, 1916, the company placed orders for 100 center-entrance high-speed multiple-unit control stepless semi-convertible cars for use in the East Boston tunnel, these cars being contracted for at the price of approximately $8,750 each, or a total cost of $875,000 for delivery beginning in May, 1917, at the rate of five cars per week. On Aug. 25, 1916, the company placed an order for forty-two rapid-transit cars, similar in design to those operated on the elevated lines and in the Washington Street tunnel, except that the doors are slightly enlarged, at the price of approximately $12,000 each or a total cost of $504,000. Delivery on these cars will begin in April, 1917, at the rate of two to four cars per week. On Jan. 13, 1917, the company placed an order for thirty-five cars for use in the Dorchester tunnel, substantially identical to those now in use in the Cambridge subway, at the price of approximately $18,500 each, or a total cost of $647,500, for delivery beginning in November, 1917, at the rate of six cars per week. In other words, during the past six months the company has placed orders for $2,026,500 worth of equipment to the extent of 177 cars, these cars being all of the latest design, all steel and embodying all the latest developments of the art in all appurtenances and auxiliary equipment. The contracts for these cars have in each case been let with the lowest bidder at a cost of about 70 per cent above the cost of two years ago, and deliveries are to be made at the earliest possible date.

"Previous to the placing of the order for the first of these cars on Aug. 25, 1916, the company had during the past six years purchased 135 rapid transit cars and 450 surface cars on the following dates at the respective prices specified:

Elevated Cars:	
20 in 1911 at $ 9,962.71 each	$199,254.13
55 in 1913 at 10,961.25 each	602,868.73
Cambridge Subway Cars:	
40 in 1911 at $12,237.97 each	489,519.00
20 in 1912 at 11,418.85 each	228,377.13
Surface—Semi-Convertible Cars:	
50 in 1910 at $7,548.90 each	377,445.19
50 in 1911 at 7,607.38 each	380,369.34
75 in 1912 at 6,535.66 each	490,174.96
100 in 1913 at 6,897.34 each	698,733.50
Surface—Trailer Cars:	
125 in 1915 at $3,217.61 each	402,200.94
50 in 1916 at 3,521.41 each	176,070.73
	$4,045,013.65

"In addition to the above investment, the company has spent, in order to widen tracks sufficiently to operate new cars, during the same period, $226,734; has spent for bridge strengthening, carhouse changes and loops for these new cars, $354,316, and in order to furnish power for the operation of equipment, the company has spent for generation, substations and distribution lines, $6,360,400, during the same period. Further, the company has invested, since the spring of 1912 in the Cambridge Subway, East Cambridge viaduct and various station and carhouse enlargements, a total of $14,619,000, and during the same period has incurred obligations to pay rental on Beacon Hill tunnel, Boylston Street Subway, East Boston Tunnel extension, a total investment of $8,572,000, as well as to pay interest on a further investment in the Dorchester Tunnel and its equipment, the Everett extension, the Bennington Street double track and the improvement of Lake Street, of $13,192,186.

"In other words, since 1911, the company has either as a result of legislative acts or with the approval of the Public Service Commission incurred a liability to pay either rental or interest on an investment for improved service of $49,396,149. Of this sum, $34,177,463 represents property now in operation and $15,218,686 property which will be in operation during the next year. This $49,396,149 is substantially equivalent to the total amount of money invested in what is now the Boston & Albany Railroad Company from the first charter in 1831 up to date."

Poles Purchased in 1915

More Than Half of the 4,000,000 Poles Purchased in This Year Were of Cedar

Statistics have been compiled by the Government Forest Service on the poles purchased during 1915 in the United States by telephone and telegraph companies, steam and electric railroads, and electric light, heat and power companies. Information was requested from approximately 17,000 purchasers, representing practically all the pole users in this country. The data in the following tables represent between 90 and 95 per cent of all the poles purchased. A few sawed poles of redwood and western pine are not included.

The annual demand for poles, which now exceeds 4,000,000, the report states, is supplied principally from three different regions of the United States. The northern white-cedar region of the Lake states, the chestnut region of the Eastern portion of the country, and the Western red-cedar region of the Northwest, which includes Idaho, Oregon and Washington.

Most of the cedar poles purchased were the Northern white variety, which were purchased largely by telephone and telegraph companies and steam railroads. Electric railways, light and power companies, however, it was noted, purchased more of Western red cedar than any other type of pole. These companies also had a large demand for pine poles.

In Table I, data for the years from 1908 to 1911, compiled in co-operation with the Bureau of the Census, are also given. Cedar, chestnut and pine constitute 91 per cent of all poles reported purchased in 1915, and of this amount 61 per cent were cedar. Most of the pine was that commonly known as southern yellow pine, which includes longleaf, shortleaf and loblolly. Western yellow pine was also reported in small quantities. The use of cypress as a pole timber seems to be falling off each year. The minor

TABLE I—POLES PURCHASED IN 1915, AND FROM 1908 TO 1911, CLASSIFIED BY KIND OF WOOD

Kind of Wood	1915	1911	1910	1909	1908
All kinds	4,077,964	3,418,020	3,870,694	3,738,740	3,249,154
Cedar	2,521,769	2,100,144	2,431,567	2,439,825	2,200,139
Chestnut	651,643	693,489	677,517	608,066	516,049
Pine	546,233	161,690	184,677	179,586	116,749
Oak	199,442	199,590	265,290	236,842	160,702
Cypress	67,644	72,995	75,459	77,677	90,579
All other	91,233	190,112	236,184	196,744	164,936

species, classified in the tables as "all other kinds," were redwood, spruce, tamarack and osage orange.

As indicated in Table II, the principal purchasers of poles were telephone and telegraph companies. They reported, however, a decrease of 30 per cent, as compared with the number purchased in 1911. The number reported by electric railways and power companies represents an increase of 44 per cent, and that for steam railroads a 76-per cent increase.

TABLE II—POLES PURCHASED IN 1915, CLASSIFIED BY KIND OF WOOD AND CLASS OF PURCHASER

Kind of Wood	Total	Telephone and Telegraph Companies	Electric Railways, Light and Power Companies	Steam Railroads
All kinds	4,077,964	1,680,880	1,430,122	966,962
Northern white cedar	1,747,210	1,029,219	239,864	478,127
Chestnut	651,643	336,496	275,304	39,843
Western red cedar	567,770	105,590	422,312	39,868
Pine	546,233	69,787	388,210	88,236
White oak	177,799	34,644	13,110	130,045
Red cedar	117,545	21,386	8,424	87,735
Southern white cedar	89,244	16,661	14,686	57,897
Cypress	67,644	24,162	18,174	25,308
Red oak	21,643	6,912	13,001	1,730
All other	91,233	36,023	37,037	18,173

Table III classifies the poles according to length, and shows that all of the leading woods contributed poles to each group. About 67 per cent were less than 30 ft. long, and were used chiefly by telephone and telegraph companies. Those less than 20 ft. long were reported largely by rural telephone companies. The figures for this group show an increase as compared with reports for 1911, while the number of poles between 20 ft. and 30 ft. in length was less.

TABLE III—POLES PURCHASED IN 1915, CLASSIFIED BY LENGTH AND KIND OF WOOD

Kind of Wood	Total	Less Than 20 Ft.	20 to 29 Ft.	30 to 39 Ft.	40 to 49 Ft.	50 Ft. or More
All kinds	4,077,964	1,236,694	1,531,441	980,091	256,236	73,502
Northern white cedar	1,747,210	540,565	755,311	373,874	67,358	10,102
Chestnut	651,643	23,992	255,951	295,717	63,676	12,307
Western red cedar	567,770	17,874	314,010	139,041	71,608	25,237
Pine	546,233	373,688	69,931	65,004	23,914	13,696
White oak	177,799	120,393	33,550	16,120	5,998	1,738
Red cedar	117,545	94,997	14,870	5,624	1,541	513
Southern white cedar	89,244	4,414	13,282	49,264	15,734	6,550
Cypress	67,644	13,048	22,211	26,316	4,542	1,527
Red oak	21,643	3,737	16,341	1,280	139	146
All other	91,233	43,986	35,984	7,851	1,726	1,688

More Cables Going Underground

Municipal and Economical Requirements Accelerate Use of Conduit—Safe Voltage Limits Are Increasing

The cable market conditions have temporarily held back much underground work but the trend of the times is toward a rapidly increasing use of underground, rather than aerial, wires and cables. This statement no doubt will apply more exactly to the power and lighting field than to the electric railway field, but the municipal requirements of the larger cities, the demand for continuity of electric railway feeding service and the economic necessity for permanent construction, are accelerating the use of underground conduits for railway feeders. The impelling factors, according to a recent statement of the National Fireproofing Company, Pittsburgh, are lower maintenance costs and reductions in the number of interruptions. On the latter point, at a meeting of the American Institute of Electrical Engineers, the late H. G. Stott of New York is quoted as having called attention to the efficiency of underground service with the following statement: "The number of burn-outs per 100 miles of underground cable per annum has fallen during the last two years to 0.28, or practically one per 400 miles of cable per year. That is a reassuring record; when an overhead transmission line can show anything like it, we can look forward to reliable long-distance transmission."

The statement is also made by the National Fireproofing Company that the limits of installation and size have kept the transmission voltage for underground cables to about one-third that for overhead transmission. Numerous installations are in operation where the pressures are 20,000 volts and even 25,000 volts; while from present indications underground systems operating at potentials of 50,000 volts and over will not be uncommon in a few years.

The McRoy-Camp conduits as manufactured by the earlier mentioned company, have been standardized and, therefore, can be sold on a more uniform basis than in earlier years when there was a greater diversity in the character of products intended for the same service.

Industrial Mobilization Continues

The mobilization of industrial resources, as a consequence of the international situation created by Germany in the renewed threat of ruthless submarine warfare has continued in Washington during the past week.

The Council of National Defense has held various meetings in Washington with its advisory commission.

Representatives of trades, business and professions are being asked to deal with this Council directly for the discussion of problems in industrial mobilization which may affect the national welfare. The time is rapidly coming, a Washington correspondent of the *Electrical World* reports, when there will be very little, if any, publicity given to these measures of industrial mobilization for national defense. In other words, a censorship is liable to go into effect any day. Already certain steps have been taken by the government in regard to censorship and the plans for an extension of this precaution are upon a scale which will preclude the possibility of business men obtaining news of their industries from the daily newspapers. Even now, the news sent from Berlin by wireless is being censored by the State Department before publication in this country, and the proposed act of Congress providing for a general censorship is ready for rapid passage by Congress. In these circumstances, the best Washington opinion is that leaders in industry will do well to place themselves in personal communication with the government, without waiting "for any eventuality."

CURRENT PRICES FOR MATERIALS

Quoted Thursday, Feb. 15.

Copper (electrolytic)	New York, 34½ cents per pound
Rubber-covered wire (base)	New York, 39 cents per pound
No. 0000 feeder cable (bare)	New York, 37½ cents per pound
No. 0000 feeder cable (stranded)	New York, 35 cents per pound
No. 6 copper wire (insulated)	New York, 35 cents per pound
No. 6 copper wire (bare)	New York, 37 cents per pound
Tin (straits)	New York 53 cents per pound
Lead	New York 9 cents per pound
Spelter	New York, 10¾ cents per pound
Rails, A. S. C. E., O. H	Mill, $40 per gross ton
Rails, A. S. C. E., Bess	Mill, $38 per gross ton
Wire nails	Pittsburgh, $3 per 100 pounds
Steel (bars)	Pittsburgh, 3.25 cents per pound
Sheet iron (black, 28 gage)	Pittsburgh, 4.75 cents per pound
Sheet iron (galv., 28 gage)	Pittsburgh, 6.50 cents per pound
I-beams over 15 in	Pittsburgh, 10 cents per pound
½-in. galv. extra high strength steel wire	New York, $6.82 per 100 ft.
⅜-in. galv. high strength steel wire	New York, $3.41 per 100 ft.
⅜-in. galv. Siemens-Martin wire	New York, $2.52 per 100 ft.
5/16-in. galv. Siemens-Martin wire	New York $1.94 per 100 ft.
Galvanized barb wire and staples	Pittsburgh, 3.85 cents per pound
Galvanized wire (ordinary)	Pittsburgh, 3.65 cents per pound
Cement (carload lots) with rebate for sacks	New York, $2.07 per barrel
Cement (carload lots)	Chicago, $1.96 per barrel
Cement (carload lots)	Seattle, $2.60 per barrel
Sand in large lots	New York, 50 cents per ton
Linseed oil (raw, 5-bbl. lots)	New York, 94 cents per gallon
Linseed oil (boiled, 5-bbl. lots)	New York, 95 cents per gallon
White lead (100-lb. keg)	New York, 9¾ cents per pound
Turpentine (bbl. lots)	New York, 52 cents per gallon

OLD METAL PRICES

Copper (heavy)	New York, 29 cents per pound
Copper (light)	New York, 25 cents per pound
Red brass	New York, 21 cents per pound
Yellow brass	New York, 19 cents per pound
Lead	New York, 8 cents per pound
Steel car axles	Chicago, $34 per net ton
Zinc	8.5 cents per pound
Iron car wheels	Chicago, $18 per gross ton
Steel rail (scrap)	Chicago, $24.50 per gross ton
Steel rail (relaying)	Chicago, $30 per gross ton
Machine shop turnings	Chicago, $9.25 per net ton

ROLLING STOCK

Lorain (Ohio) Street Railway has placed an order with the Jewett Car Company for twelve 52-ft all-steel interurban car bodies and for five steel car bodies for city service.

Southern Illinois & St. Louis Railway, Marion, Ill., has ordered four 50-ft. steel express cars, three 50-ft. steel passenger cars and eleven 60-ft. interurban cars from the American Car Company, St. Louis, Mo.

Ocean City & Fenwick Island Railway, Ocean City, Md., is in the market for about ten miles of 60-lb. relaying rail, also for necessary overhead material and four open-type trolley cars.

Wheeling (W. Va.) Traction Company, noted in the Electric Railway Journal of Feb. 3 as being in the market for cars, has placed an order with the Jewett Car Company for fourteen prepayment car bodies.

Tri-City Railway, Davenport, Iowa, will remodel twelve old cars for service as pay-as-you-enter cars. The work will be started as soon as the new car house and shops have been completed at Thirty-fifth Street and Fifth Avenue, Rock Island, Ill.

Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa, has specified the following details on the ten closed motor cars recently ordered from the American Car Company:

Seating capacity	40
Bolster centers, length,	15 ft. 10 in.
Length of body	25 ft. 6 in.
Over vestibule	37 ft. 6 in.
Width over sills	8 ft. 0 in.
Width over all	8 ft. 3 in.
Height, rail to sills	26¼ in.
Sill to trolley base	8 ft. 6 in.
Body wood or metal,	Metal and wood
Interior trim	Bronze
Headlining	Agasote
Roof, type	Monitor deck
Underframe	Metal
Air brakes	General Electric
Axles	Brill
Bumpers,	American Car Company
Cables	General Electric
Car trimmings	Brill
Control type	K-12
Couplers	Brill Radial
Curtain fixtures	Curtain Supply
Window fixtures	Brill
Curtain material	Pantasote
Door operating mechanism,	American Car Company
Destination signs	Keystone
Gears and pinions,	General Electric
Gongs	American Car Company
Hand brakes	Pittsburgh Drop Handle with Peacock Drum
Headlights	Golden Glow
Journal boxes	Brill
Motors, type and number,	Four, G. E., 258-A
Motors	Inside hung
Paint	C. V. Process
Registers	International
Sanders	Ohio Brass
Sash fixtures	Brill
Seats, style,	Hale & Kilburn, 199A
Seating material	Rattan
Springs	Brill
Step treads	Feralin anti-slip
Track scraper	Brill
Trolley catchers	Ohio Brass
Trolley base	General Electric
Trucks, type	Brill 77-E-1
Wheels	American Car & Foundry
Special devices,	Brill renitent post casings

TRADE NOTES

W. B. Cosgrove, 50 Church Street, New York, N. Y., has been appointed special representative of the Chicago Mica Company.

Ohio Brass Company, Mansfield, Ohio, has received an order from the Connecticut Company for 146 air sander equipments.

S. K. F. Company, Ltd., 47 King Street, West Toronto, Ontario, Canada, has been recently organized to handle the S. K. F. products in Canada.

Templeton, Kenly & Company, Ltd., Chicago, Ill., held the annual meeting of stockholders on Feb. 3. H. W. Finnell, vice-president of the company, was elected a director.

William H. Bennett, who for nearly a year has been advertising manager of the Searchlight Company, Chicago, has joined the forces of the Service Motor Supply Company, Fifteenth Street and Michigan Avenue, Chicago, Ill.

Bound Brook (N. J.) Oil-less Bearing Company announces the election of its second vice-president, Spencer Weart, as president and the election of its general manager, George Oakley Smalley, as treasurer.

Commercial Electric Supply Company, 42 Congress Street, East Detroit, Mich., has appointed Frederick Riebel, Jr., formerly district sales manager of the George Cutter Company, as general manager.

United States Ball Bearing Company, Chicago, Ill., announces that Otto Bruenauer has become associated with them, in the enlargement and broadening of their field of activities, as engineering manager.

Perry Ventilator Corporation, New Bedford, Mass., has received an order to equip with ventilators the twelve cars for the Worcester Consolidated Street Railway being built by the Osgood Bradley Car Company.

Standard Forgings Company, Chicago, Ill., announces that at the annual meeting of the company, 411 Railway Exchange Building, E. W. Richey was elected vice-president and J. G. Coles was elected treasurer. George E. Van Hagen is president of the company.

Quasi-Arc Weldtrode Company, West Nyack, N. Y., has been incorporated by W. Moffatt, D. C. Alexander and F. W. Gordon, 61 Broadway, New York, N. Y. The company is capitalized at $150,000 and proposes to manufacture electrodes, weldtrodes, machinery, accessories, etc.

Moody Engineering Company, New York, N. Y., has been incorporated by R. H. Jones, F. R. and R. D. Moody, 115 Broadway, New York, N. Y. The company is capitalized at $250,000 and proposes to do a general consulting, operating, electrical, mechanical and civil engineering business.

Richardson-Phenix Company, Milwaukee, Wis., announces the opening of a sales office in Cleveland, located in the Builders' Exchange, in charge of W. J. Oettinger, in order to take care of the increased business in Ohio. Mr. Oettinger was formerly connected with the engineering department at the home office.

Union Switch & Signal Company, Swissvale, Pa., on Feb. 10 had a portion of its plant, including the machine shop and the packing department, destroyed by fire. However, the foundry, forge shop, pattern and carpenter shops and the general offices, which house the drawings, were left entirely untouched.

Pratt & Lambert, Buffalo, N. Y., varnish makers, have elected the following officers and directors for the coming year: W. H. Andrews, chairman of the board; J. H. McNulty, president; J. N. Welter, vice-president; J. B. Bouck, Jr., secretary and treasurer; A. C. Bedford, C. M. Pratt, F. W. F. Clark, R. F. Clark, S. N. Griffiths and J. P. Gowing, directors.

H. W. Watts, who has been in the New York office of the Diehl Manufacturing Company for several years has been promoted to manager of the Boston office. Mr. Watts succeeds H. A. Howard, who has resigned to devote his entire time to the companies in which he is personally interested. L. F. Tankard has been promoted to manager of the New York office of the company.

Kennedy, Mitchell & Company, Inc., New York, N. Y., fiscal agents for Southern Illinois & St. Louis Railway, have combined the railway company's office which was previously at 15 Wall Street with that of the Kennedy, Mitchell & Company's office at 42 Broadway. The operating offices of the railway are located at Marion, Ill. W. H. Schott is president and treasurer of the company.

Strauss Transit System, Inc., 185 Jefferson Avenue, East, Detroit, Mich., has issued an illustrated booklet describing the Strauss inverted elevated railway system. In this system the cars are suspended from a trussed overhead structure mounted on a single line of posts. The designer of this system is J. B. Strauss, president and engineer of the Strauss Bascule Bridge Company of Chicago.

A. W. Hartigan of the New York sales department of the Western Electric Company has been appointed sales manager of the Electrical Alloy Company with headquarters at 41 Union Square, New York City. The company also announces that it now occupies a new, large, modern, fireproof factory building, just completed, in Morristown, N. J., which will enable it to increase vastly its production.

Electric Crane & Manufacturing Company, Milwaukee, Wis., has been organized by a group of former officials and engineers of the Pawling & Harnischfeger Company, including S. H. Squier, M. A. Beck, Arthur Mayer, Leo Mayer and Arthur A. Fritsch. The company has purchased the plant of the former Fred M. Prescott Steam Pump Company, at Sixty-fourth and National Avenues, West Allis.

Hess-Bright Manufacturing Company, Philadelphia, Pa., announces the opening of two branch sales offices—one at 1974 Broadway, New York, N. Y., and one at 1036 Guardian Building, Cleveland, Ohio. H. E. Brunner is in charge of the New York Office and is assisted by H. A. Fonda. The Cleveland Office is under the direction of R. E. Clingan, assisted by Walter Rippier and M. S. McNay. W. L. Batt, general sales manager, states that these offices are opened with the intention of giving more prompt and thorough attention to the ball bearing trade than has heretofore been possible.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., announces, in addition to a large number of orders for central station apparatus, an order for eight additional 1500-kw. rotary converters with transformers from the Cleveland Railway Company. This makes a total of twenty 1500-kw. Westinghouse rotary converters which this railway has ordered from the Westinghouse Company.

American Railways Equipment Company, Dayton, Ohio, which has recently begun the manufacture of a coin-ticket registering fare box for prepayment fare collection, has opened offices at 1165 Reibold Building. D. B. Whistler, who has been actively identified with the fare register business in this city for the last fifteen years, is the inventor and president of the new company. E. L. Reed, patent attorney, is associated with Mr. Whistler.

Stephenson Sons & Company, Inc., New Haven, Conn., railway contractors and dealers in railway investments, announces that the company has incorporated for $100,000, all paid in. Edward N. Breitung, international banker, and heavily interested in the iron industry in the upper Peninsula of Michigan, is president; Gen. Charles Neilson, a railroad constructor and financier, with offices at 11 Pine Street, New York, is vice-president; C. C. Carroll is secretary, and William F. Lewis, treasurer.

E. B. Merriam, for several years assistant engineer of the switchboard department of the General Electric Company, has resigned his position to become the head of the industrial service department. Mr. Merriam has been connected with the company for sixteen years and is well known for his work in connection with high-voltage automatic circuit interrupting apparatus. He has contributed a number of technical papers to the A. I. E. E., N. E. L. A., etc., on protective apparatus. He was chairman of the Schenectady section of the Institute in 1913.

Combustion Engineering Corporation, New York, N. Y., has doubled the size of its New York offices to accommodate the increase in business. This company has also added considerably to its staff of engineers and draftsmen. A service department will be established under the direction of John Morris, who has been associated with the company since its organization. Mr. Morris will have under his direction a corps of competent engineers who will co-operate with the trade with the idea of rendering free inspection and engineering service.

Berger Manufacturing Company, Canton, Ohio, announce the following appointments: R. W. Van Horne has been transferred from the New York office and placed in charge of the building material products division at the home office; Norman A. Hill, formerly efficiency engineer for the Du Pont Powder Company, has been appointed efficiency engineer; P. V. Stonerod, formerly inspector for the Carnegie Steel Company, has been placed in charge of the sidewalk light department; and A. H. Bromley, Jr., contracting engineer, who for the last several years has looked after the interests of the Berger Manufacturing Company in the Cleveland territory, has been appointed chief engineer of sales. and hereafter will be located in the Canton office.

Holden & White, Chicago, Ill., general sales agents for the Joliet Railway Supply Company, have recently received a number of orders for Perry anti-friction side bearings and Hartman self-centering center plates. Orders for these bearings have been placed by the following electric railways: Fort Wayne & Northwestern Railway; Beaver Valley Traction Company; Aurora, Elgin & Chicago Railway; Metropolitan West Side Elevated Railway; Washington, Baltimore & Annapolis Electric Railway; Newport News & Hampton Railway, Gas & Electric Company; American Car & Foundry Company for Louisville Railways; Fonda, Johnstown & Gloversville Railroad Company; Northern Texas Traction Company; Houghton County Traction Company; J. G. Brill Company for the Ogden, Logan & Idaho Railway; Schenectady Railway; Union Traction Company of Indiana; Baldwin Locomotive Works; McGuire-Cummings Manufacturing Company for the Chicago & West Towns Railway; New York, Westchester & Boston Railway; Northwestern Elevated Railroad; Calgary Street Railway, and the Des Moines City Railway.

ADVERTISING LITERATURE

Standard Varnish Works, New York, N. Y., has issued a pamphlet on its waterproof cement floor paint.

Cumberland Electric Manufacturing Company, Clarksville, Tenn., has prepared a bulletin descriptive of its low-voltage transformers and electrical specialties.

Laclede-Christy Clay Products Company, St. Louis, Mo., has issued a bulletin of a complete line of fire brick for every furnace requirement.

Ray Manufacturing Company, Louisville, Ky., has issued a bulletin descriptive of its continuous feed-water regulators.

Laconia Car Company, Boston, Mass., has issued a catalog describing all types of steam and electric railway cars for freight and passenger service. Illustrations and details of construction are given for 67 cars built for the different roads. Figures 1 to 50 show cars for steam railroad service, and figures above 50 show cars for electric railway service.

S. K. F. Ball Bearing Company, Hartford, Conn., has issued an attractive catalog on its self-aligning ball-bearing hangers and pillow blocks. The subjects of power saving, the use of small motors, saving in lubrication and in maintenance, reducing fire hazards, etc., are fully covered. A number of pages of data containing tables, curves and engineering data on mounting, lubrication, testing lubricants, dimensions of equipment, etc., are given. Announcement is also made of the S. K. F. engineering service.

Western Electric Company, Inc., New York, N. Y., is distributing its 1917 year book on electrical supplies. This book follows the plan of uniform list prices that was inaugurated in the year book of 1915. This 1310-page volume is well illustrated and has been carefully prepared in such a manner as to make things easy to find for the prospective purchaser. This year book is regularly supplemented by descriptive matter, booklets and other literature on the following: Poles, pole-line hardware, motors and generators, telephone apparatus, lamps, automobile accessories, electrical material for farms and electrical household devices.

NEW PUBLICATIONS

Principles of Alternating-Current Machinery. By Ralph R. Lawrence, Associate Professor of Electrical Engineering of the Massachusetts Institute of Technology. McGray-Hill Book Company, Inc., New York, N. Y. 603 pages. Cloth.

Written especially for technical men and students in electrical engineering, this book deals with the construction of alternating-current machines and the principles of their operation. All those types of machines are dealt with which embody fundamental and important principles in this field. It is not essentially a book on design, although calculations are given to analyze the electrical theory underlying various details of construction and winding.

Underground Transmission and Distribution. By E. B. Meyer. McGraw-Hill Book Company, Inc., New York, N. Y. 308 pages. Cloth, $3, net.

Pole and Tower Lines. By R. D. Coombs, C.E. McGraw-Hill Book Company, Inc., New York, N. Y. 267 pages. Cloth, $2.50, net.

Mr. Meyer in his book deals with the operation of underground systems for distributing electrical energy for lighting and power purposes. He describes, in part, the various methods of distribution, manhole and conduit construction, and the installation and testing of cables. He explains the practical methods of meeting problems involved, but assumes that the reader understands the principles underlying electrical theory. The book by Mr. Coombs is devoted to the subject of overhead construction, the developments necessitated by the use of high transmission voltage being of especial importance. He discusses factors in the design of poles and towers, and gives methods of erection and testing. Those two books afford a general knowledge of present practices in electric power transmission, since each is able to cover its field more fully than could a treatise of wider scope.

Electric Railway Journal

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Consolidation of Street Railway Journal and Electric Railway Review

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RELIEVING THE RAILWAY OF THE PAVING BURDEN

Undoubtedly one of the most promising directions in which money can be directly saved for the purpose of improving service by electric railways is in obtaining release from the traditional paving burden with which they are saddled. Railways are looking for means of widening the margin between income and outgo. Here is a very tangible way in which it can be done, and it can be done because it ought to be done. The illogical character of the paving burden is indicated in an article by W. R. Dunham, Jr., in this issue, and we expect to publish other articles giving further proof of the truths which he convincingly sets forth. There is good reason to believe that the public through its public service commissions is coming to realize that this method of increasing the railway net has many points to recommend it. For one reason, it involves no changes in the rates of fare or in the transfer regulations, and for another reason it can be justified in equity, because it is hardly more logical to require repaving by electric railways than it would be to require them to light or police the streets on which they run. The public is reasonable in these matters when fully informed.

SCHEDULE SPEED A VITAL FACTOR

The plan of the Denver Tramway Company, as mentioned in last week's issue, to make an expert analysis of its schedules with the object of working out the most economical arrangement for each of its lines is significant. We are mentioning the plan not because the company in Denver is the first to adopt it but because we believe that scientific schedule making is at once the most neglected field as well as the one which is productive of greatest results on the average electric railway to-day. As has been shown in previous issues of the Electric Railway Journal, schedule speed has a more potent influence upon operating expenses than any other single item. In fact, under favorable circumstances a change in running time may even be reflected by an almost directly proportional change in the final cost of operation, wherein interest and depreciation charges on equipment, as well as working expenses, are considered. Yet it is not unusual to find a great deal of time and attention devoted to the saving of, say, 10 per cent in the cost of maintenance of equipment or track, or the expense of producing power—with the result that, at most, about 1 per cent, or 1.5 per cent or 2 per cent, respectively, of the operating expenses may be saved. At the same time the matter of schedule speed may be absolutely neglected, although a decrease of 10 per cent in running time on a property of reasonable size may bring about an equivalent saving that ranges from 4 per cent to 7 per cent of the operating expense because of the decreased platform costs and the decrease in the number of cars required to handle the traffic. In a word, the industry might better forget altogether the question of maintenance and power costs if, by so doing, it could concentrate effectively on the vital factor of schedule speed. That there is a field for such endeavors is evident from the fact that, although an average of 11 m.p.h. has been attained in a large city, speeds of less than 8 m.p.h. are almost the rule.

ADVERTISEMENTS IN "AERA"

We have never believed that the policy of the American Electric Railway Association in soliciting advertisements from manufacturers for publication in *Aera* was a proper one to pursue for several reasons, among them the following: (1) It puts a burden of expense for the maintenance of the association activities on the manufacturers over and above that which is borne by the railway companies, as both pay dues on the same basis. (2) This expenditure is largely to duplicate existing service and is unfair competition with technical papers. (3) The publication of a commercial magazine is a business activity as much out of harmony with the aims and spirit for which the association was founded as the manufacture of railway supplies, carbodies or machine parts. (4) A question of principle is involved. To this phase Colonel Williams and Mr. Tripp call special attention in their report presented to the executive committee at its Boston meeting. This report with the majority report on the subject is published elsewhere in this issue with the permission of President Storrs. Colonel Williams and Mr. Tripp say:

> "Even if no improper pressure has been or is brought to bear upon manufacturers and sellers of railroad apparatus in the solicitation of advertising, the very fact of such solicitation and the existence of such a medium, contributing as it does largely to the expense of the publication, cannot help being a potent but silent influence in compelling advertisements from those who otherwise would not seek or avail themselves of such an advertising medium. If we are right in this view, then the continuance of advertising involves not only a question of policy but a departure from that high standard of principle to which the association should adhere."

These are strong words and very much to the point, coming as they do from the head of a large metropolitan electric railway system, at one time himself an active newspaper man, and from the chief executive of a large manufacturing organization. Incidentally, Mr. Tripp, besides being in an especially good position to understand the advertiser's point of view, was the only representative of the manufacturers on the committee and thus may be considered fairly to have represented their side of the industry. The report of the sub-committee has now laid the question before the membership at large. It is important for every member of the organization to appreciate clearly the practical and ethical aspects of the policy to the end that advertising shall be speedily eliminated.

GEARLESS EQUIPMENT FOR MOTOR CARS From every standpoint the bi-polar gearless motor, such as is used on the New York Central locomotives, has been such an unqualified success during its ten years of operation that question may well be raised as to why it has not been applied to motor cars. Admittedly, the design has the vitally important feature of simplicity, and as we have previously pointed out, it may save more than enough through eliminated gear losses to pay for its higher first cost. Yet for motor cars the literally enormous weight of the magnetic circuit, which inevitably is extremely large in cross-section and long and clumsy in form because it must be built into the truck frame, absolutely prohibits its use for this service. In fact, several of the multiple-unit cars operated on the New York Central's electric zone were at one time provided with the bi-polar equipment as an experiment. As might be expected from the remarkable performance of the similarly-equipped locomotive they were eminently satisfactory from an operating and maintenance standpoint, but they necessitated the hauling around such an enormous excess of weight over the standard geared cars that the equipment had ultimately to be discarded and replaced with geared motors of the standard type. There seems to be, in consequence, no possibility that the gearless motor, notwithstanding its advantages of saving some 5 per cent in energy consumption and reducing maintenance, will ever come into use for motor car service.

DAYLIGHT SAVING BEFORE CONGRESS

Daylight saving, the plan of moving the clock ahead an hour in order to make our day correspond more closely to the hours of sunlight, is now being considered by both houses of Congress. It has the hearty support of President Wilson, and the Chamber of Commerce of the United States indorsed the plan at its recent annual meeting in Washington. The Daylight Saving Convention held in New York at the same time passed resolutions asking Congress to pass the bills. It therefore appears that daylight saving is in a fair way of being adopted by this country.

European countries last summer gave a practical demonstration of the plan. England, France, Germany, Austria, Italy, Holland, Denmark, Norway, Sweden and Portugal each set the clock ahead during the summer months, with the result that there was no confusion in the shifting of time, and the popular verdict was in favor of the change. There seems to be no doubt that the plan will be put into effect in Europe again next summer.

The issue of the ELECTRIC RAILWAY JOURNAL for June 16, 1916, on page 1118, called attention to some of the ways in which electric railways would be affected by the change of time. In many of them the effect would be beneficial. For example, the evening rush hour would come during daylight during many more days of the year than it now does. This would add to the public convenience and reduce the number of accidents. It would also be an advantage to railways that have a large lighting load, since the peaks of the railway load and the lighting load would not come together. All forms of recreation which require daylight would be greatly benefited, and there is no doubt the railways would receive increased travel in cars to and from baseball grounds and other places where outdoor sports take place. In the shops, of course, the change would also be beneficial in that it would substitute a cool morning work hour for a warm evening work hour, and the workmen after leaving the shop would have an extra hour of daylight to devote to recreation.

Since this plan has apparently worked out well in the ten European countries in which it has been tried, it is only reasonable to expect that it would be a success in the United States also. It is said that Canadian provinces are only waiting for the United States to take the lead in this change and that they will be glad to follow.

THE JOURNAL AS A CO-OPERATIVE INSTITUTION

We compared in these columns on Feb. 10 the service given by a technical newspaper and that by a public utility and found many points of resemblance. Each is in duty bound to tell its clientèle its main purposes and how it is striving to secure them. Each can be helped to give a better service when its public understands these purposes and approves them. With each the interests of the public are advanced as the service is improved and made more comprehensive. With this in mind we shall speak briefly of the JOURNAL as a co-operative institution.

One way in which the JOURNAL can help the industry is by inducing those who are giving their best thought to its improvement to express their ideas either through the editors or in signed communications and articles. Of the former we can naturally make no public enumeration, although we are glad to express here our sincere gratitude for the many helpful suggestions and active co-operation received continuously from the field. Of the signed communication there is, of course, a direct record, and a study of the lists of authors in recent volumes of the paper shows that the average number of names listed during each six months as authors of articles or communications or papers before societies is about 213. An analysis of the record of these articles published during 1916 shows that more than a sixth of them were by presidents, general managers and others in high managerial positions; more than a third were by engineers, master mechanics and others having to do with the physical property of the electric railway; slightly fewer than a third were by consulting and manufacturers' engineers, and others indirectly connected with the electric railway field, while the rest were by railway men in positions other than those mentioned. To this large group of men should be added hundreds of others who have been willing to further the development of the industry by supplying information upon which articles have been prepared by members of the editorial staff.

In order that the JOURNAL may best meet the needs of its readers, their co-operation is necessary in the carrying out of its fourfold aim. This aim is somewhat as follows: 1. To supply promptly and accurately the news of the activities of the industry. 2. To point out the tendencies indicated by this news. 3. To publish articles on special topics when such are needed to assist in further developments. 4. To publish constructive comment on all developments in the industry so as to aid the electric railway man in the solution of the daily problems and to assist him in interpreting these problems to the public. The ELECTRIC RAILWAY JOURNAL is first and last a transportation paper, but it aims to cover also the allied technical fields in so far as they overlap that of transportation.

MORE ABOUT HANDLING WAY MATERIALS

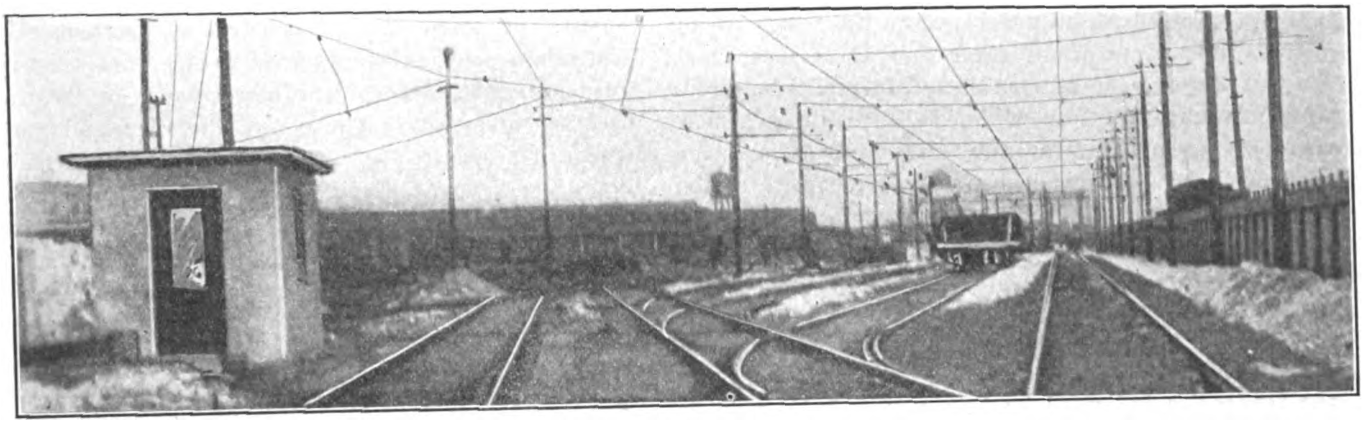
The columns of this paper have been replete, during a few weeks past, with facts and opinions regarding the economical handling of way materials. From these it is clear that there is no one best way of performing this important operation. Many questions demand answers in every case, and the answers must differ with the local circumstances. Typical questions are these: Is extensive storage profitable? How much storage will combine the maximum of security and favorable-terms buying with the minimum of handling, including local transportation? What machines are available for reducing labor cost, and which are most economical? Should storage be concentrated in one spot or on several sites? etc. The articles printed in this and previous issues indicate how the questions have been answered in a number of cases. This series would not be complete without some account of the latest large yard, that of the Cleveland Railway, of which Charles H. Clark has charge. Fortunately, it is now in shape so that a description is possible, and this is contained in an article elsewhere in this issue.

In the Cleveland storage yard somewhat different methods for handling and storing materials from those discussed in other recent articles on this subject are employed. A. E. Harvey of Kansas City, in his article in the issue for Jan. 27, emphasized the need of keeping the equipment in proper balance with the amount of work to be performed and pointed out the limitations of equipment that is useful for only a particular purpose and in one location. Further, he laid stress on the timing of the receipt of material so that it can be transferred directly to the job and thus need not be handled into and out of the storage yard. In the same issue, B. P. Legare of San Francisco stated that he had found several small storage yards to be preferable to one large one on his property.

In most yards the equipment for handling materials consists of many cheaply-constructed, permanently-located gin poles, stiff-leg derricks, etc., with very infrequent installations of the larger types of hoisting machines and traveling cranes. The Cleveland yard, however, is operated on such a large scale that many things are economically possible which would be sources of loss in less active yards. The immense gantry crane, for instance, represents such an investment that it must be kept in operation almost constantly in order to absorb the "overhead" profitably. Its area of operation along the 1000-ft. runway makes its use for handling various materials possible, as it covers a storage area 1000 ft. long by 120 ft. wide; that is, about 3 acres. With so large an area available, sand, gravel, coal, paving block, etc., are stored in the craneway, and the quantities involved are so great that the machine is kept at work almost constantly. So far as we are aware, this is the first time that the gantry crane has been adapted to electric railway work. If it proves as successful as it promises to do here, this type will constitute a serious rival to the overhead traveling crane.

Mr. Clark's aim in Cleveland has been to concentrate all stored way materials at the one location, and by this means he is able to justify large expenditures in handling equipment, and in turn realize considerable economies in loading and unloading cars. While as much material as possible is handled direct from the steam cars to the job where it is used, the quantities involved in the extension and rehabilitation work each summer in Cleveland are so great that the materials are used as fast as received or faster, and the storage serves promptly to supply the requirements in the intervals between shipments. The ample storage facilities also make it possible to take advantage of the better prices to be had when off-season delivery is permissible. Thus the price rather than the timing of delivery is considered the more important consideration in the purchase of materials.

Some of the general features of the Cleveland materials yard merit comment. For one thing it is equipped with new 80-lb. rail and new special work tamped and lined up in first-class condition for the severe usage under which it must bear up, and cars may be rather roughly handled without danger of derailment. This is in contrast to the not unusual use of partly worn-out rail and special work which leads to derailments and consequent delays. The absence of the overhead trolley has obviously great advantage in giving complete freedom of action to the various cranes. The improvised "third-rail" is, however, a makeshift arrangement which will probably prove to be so much of a nuisance that it will eventually give way to a real third-rail of the protected type and the equipment of the few necessary work cars and motor cars with third-rail shoes. The saving in the construction cost of the ground trolley over a third-rail, and the saving in a few contact shoes and cutout switches on the cars, less the cost of the hand poles, would not, we believe, offset the wasted time and unsatisfactory "fussing" with this makeshift arrangement.



CLEVELAND STORAGE YARD—FIG. 1—STORAGE TRACKS AT BACK OF HARVARD YARD AND SCALE HOUSE AT LEFT

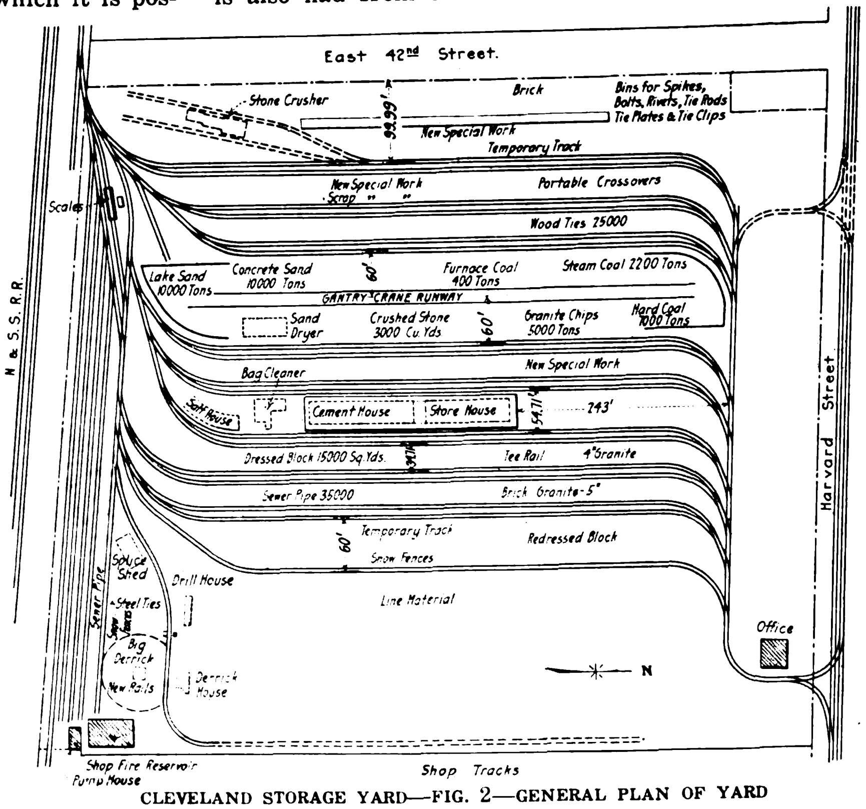
Layout and Equipment of Storage Yard for Handling Large Quantities of Way Materials

Charles H. Clark, Engineer Maintenance of Way Cleveland Railway, Has Developed New Schemes for Facilitating Economical Buying and Handling of Track Materials on a Scale Uncommon in Electric Railway Work

GREAT advantages accrue in city track construction work from the ability to have all materials delivered to the job in the amounts and at the times wanted. Also large economies are realized if suitable storage space is available by means of which it is possible to take advantage of the low prices which accompany large contracts and off-season deliveries, etc. These two considerations and a third, the advantages of concentrating the stores of the entire property very largely at one location, governed the layout and equipment of the 19-acre materials storeyard of the Cleveland Railway now nearing completion. It was planned by Charles H. Clark, engineer maintenance of way, and is called the Harvard storage yard. Its location is adjacent to the company's new Harvard Avenue shops on the eastern outskirts of the city.

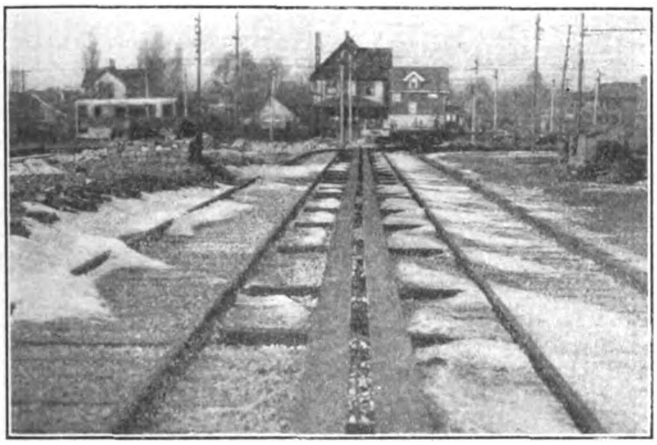
By concentrating the storage of the principal way materials for the whole company at this new yard it has been possible profitably to invest in handling facilities of size and design quite unfamiliar in electric railway storage yards. But when it is considered that the Cleveland Railway had occasion last summer to handle in and out of its storage yards 14,335 tons of 5-in. and 4-in. paving block, 25,987 yd. of old Medina paving block which was redressed and sent out again for new use, 18,000 wooden ties, great quantities of sand and gravel, cement, special work, etc., and then the 13,600 tons of coal which is in storage and being handled this winter, the economy of large investments in equipment can be readily seen.

On Jan. 26, the company had 71,196 bags of cement in stock and was taking all that it could get under a contract made last year at a price more than 20 per cent below the present market. This is one of the advantages of having facilities for the storage of 100,000 bags, as are provided at the Harvard yard. A good idea of the general quantity of materials handled at the yard is also had from the fact that during last November ninety-two cars of sand, gravel, granite block, cement, etc., were received and 312 cars were received in one month last summer, while the average year-round monthly receipt of materials is 250 cars.

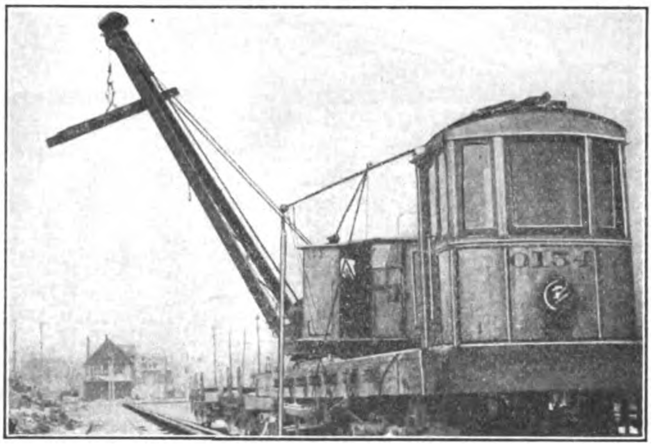

East 42nd Street.
Stone Crusher
99.99'
Brick
Bins for Spikes, Bolts, Rivets, Tie Rods Tie Plates & Tie Clips
New Special Work
Temporary Track
New Special Work
Scrap " "
Portable Crossovers
Scales
Wood Ties 25000
Lake Sand 10000 Tons
Concrete Sand 10000 Tons
60'
Furnace Coal 400 Tons
Steam Coal 2200 Tons
GANTRY CRANE RUNWAY
Sand Dryer
Crushed Stone 3000 Cu. Yds.
60'
Granite Chips 5000 Tons
Hard Coal 7000 Tons
N & S. S. R.R.
Bag Cleaner
New Special Work
Salt House
Cement House
Store House
54.71'
243'
Dressed Block 15000 Sq. Yds.
Tee Rail
4" Granite
Sewer Pipe 35000
Brick Granite-5"
Temporary Track
60'
Redressed Block
Snow Fences
Harvard Street
Splice Shed
Drill House
Sewer Pipe
Steel Ties
Snow Scrapers
Line Material
Office
Big Derrick
New Rails
Derrick House
N
Shop Fire Reservoir
Pump House
Shop Tracks

CLEVELAND STORAGE YARD—FIG. 2—GENERAL PLAN OF YARD

The location of a yard to handle such quantities of materials was an extremely important consideration, balancing as it must the real estate value against trans-

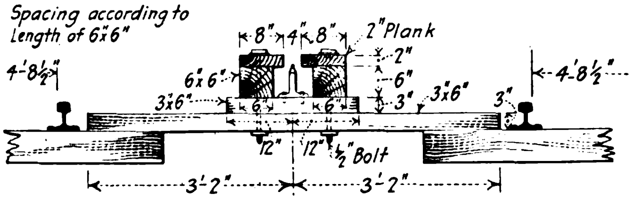


CLEVELAND STORAGE YARD—FIG. 3—GROUND TROLLEY WIRE CONSTRUCTION



CLEVELAND STORAGE YARD—FIG. 5—CRANE CAR WITH GROUND TROLLEY CONTACT POLE

portation facilities and convenience of distribution to various points in the city. The property comprises 19 acres on the eastern outskirts of the city, located on a comparatively new crosstown line which gives rather direct access to various parts of the city. Physical connection with the Newburg & South Shore Railroad, a belt line controlled by the American Steel & Wire Company, and connecting with all roads entering Cleveland, gives suitable transportation facilities.



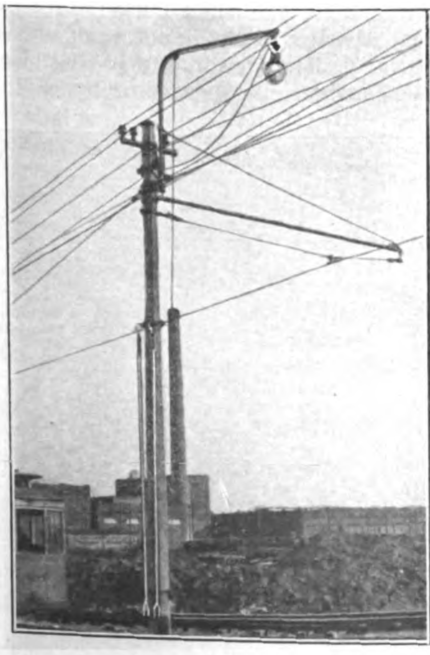
CLEVELAND STORAGE YARD—FIG. 4—DRAWING SHOWING DETAILS OF GROUND TROLLEY CONTACT SCHEME

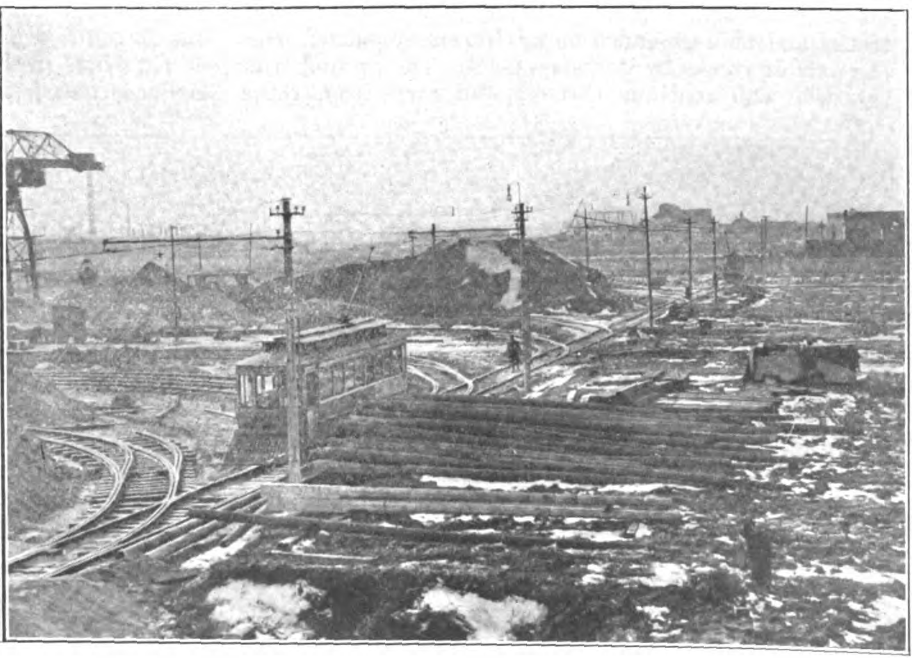
Leading from the steam line is a ladder track which serves four car-storage tracks in the yard. The Newburg Railroad sets the cars in on these tracks (Fig. 1) and from here they are moved by electric power to the unloading point in the yard. The overhead trolley is continued out of the yard and over the siding of the Newburg Railroad along the back of the yard so that the company may set empties out there for return. A 100-ton-capacity Howe scale with house and pit electrically heated, is located at the yard entrance on a track adjacent to the ladder track.

The general yard location adjacent to the company's shops is also a matter of importance on the Cleveland property, as it provides a convenient and economical means of storing and handling the large quantities of coal required for use in the hot-air heaters with which all Cleveland cars are equipped, and for the shop heating plant.

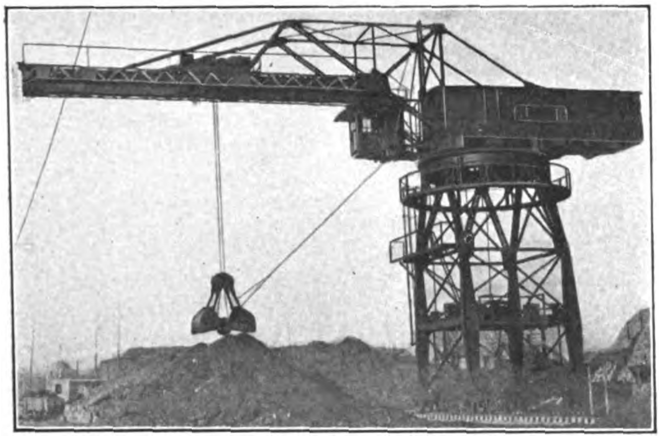
The general layout of the material yard is shown in the accompanying drawing, Fig. 2. Nineteen tracks, laid down in pairs, with 35-ft. to 60-ft. spaces between adjacent track centers for storage purposes, buildings, etc., cover the yard area, the two tracks between material, aisles giving simultaneously access to the materials on either side. Materials are assigned to these spaces tentatively as shown on the plan. All tracks are laid on well-ballasted wood ties with new 80-lb. T-rail and high-grade special work.

One of the special features of the yard is the absence of the overhead trolley which has been done away with by using an improvised third-rail (Figs. 3 and 4). Only

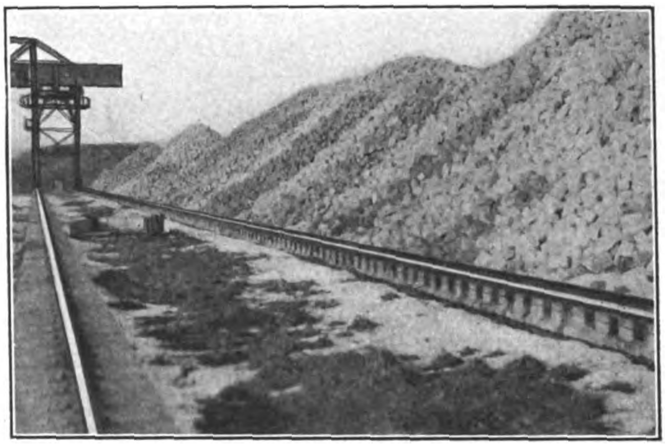




CLEVELAND STORAGE YARD—FIG. 6—CONCRETE TROLLEY POLE, YARD LIGHTING UNIT AND EXTRA TROLLEY HAND POLE; FIG. 7—GENERAL VIEW FROM OFFICE BUILDING ALONG FRONT LADDER TRACK



CLEVELAND STORAGE YARD—FIG. 8—GANTRY CRANE OF LARGE CAPACITY



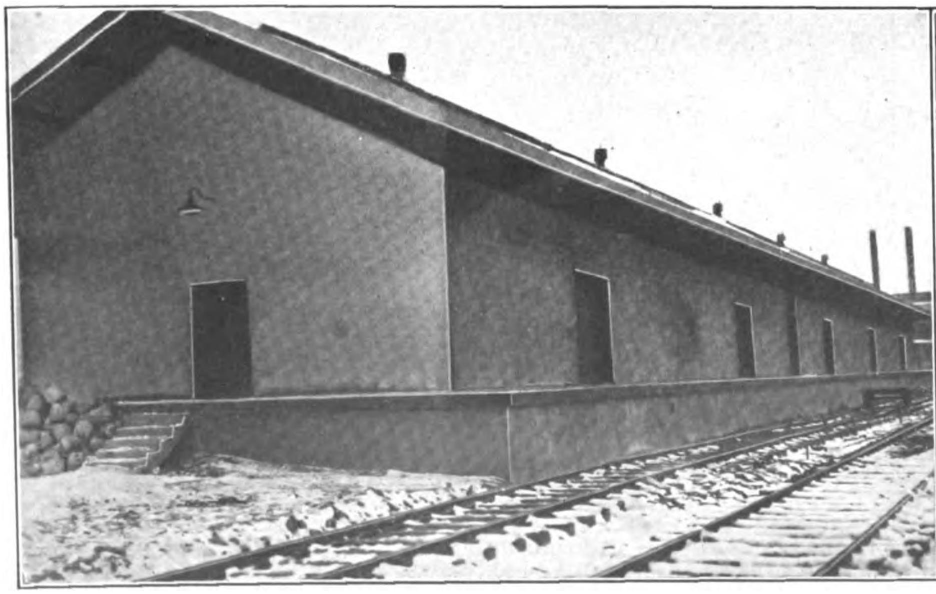
CLEVELAND STORAGE YARD—FIG. 9—PAVING BLOCK IN STOCK ALONG GANTRY CRANE RUNWAY

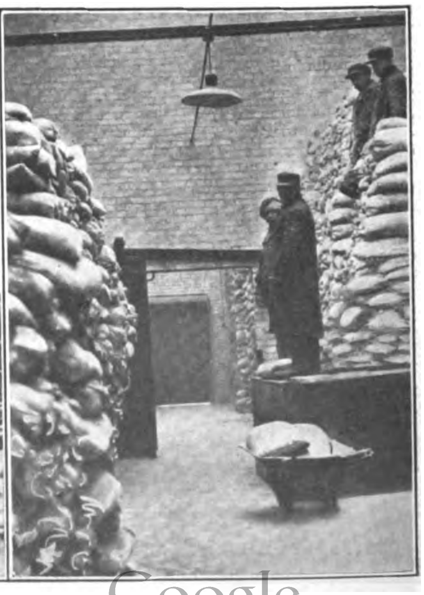
two tracks through the yard, tracks 7 and 10, which are to be used for the principal through movement, are equipped with the overhead trolley. The balance of the yard is clear of poles and wire to give free use of the various cranes. This ingenious third-rail consists of a No. 000 trolley wire fastened with standard ears on regular barn hangers set inverted on 3-in. x 6-in. x 24-in. blocks. These are mounted on 3-in. x 6-in. x 6-ft. 4-in. timbers resting on the tie ends between adjacent tracks, and each trolley serves both tracks of the pair. Protection from accidental contact with the trolley wire is afforded by paralleling it with 6-in. x 6-in. stringers on top of which 2-in. planks are fastened. These leave a 4-in. opening through which to make contact by moving the cars.

The method of making contact is also rather novel (Fig. 5). A long hollow pole equipped with a standard harp and trolley wheel at one end and a hook at the other, with a cable through the pole connecting the two, is placed on the trolley wire and hooked over the trolley wheel when the car is moved. If the trolley pole is tied down to the side of the car, the hand pole connecting with the ground trolley wire will guide itself. Ordinarily an attendant walks along on the top of the plank protection and holds the contact pole on the wire. The overhead trolley when completed will extend over the main tracks and around the curve into the storage tracks and be dead-ended on an I-beam supported over the pair of tracks by two steel poles. The ground trolley wire will continue through the yard from these points. Each section of ground trolley wire may be cut off by a knife switch mounted in a box on a pole near the end of the section when there is to be no call for use of this track during a period of time, thus eliminating danger of accident completely. Extra trolley hand poles are hung on the overhead poles at various points of the yard (Fig. 6) so that there is always one available close at hand.

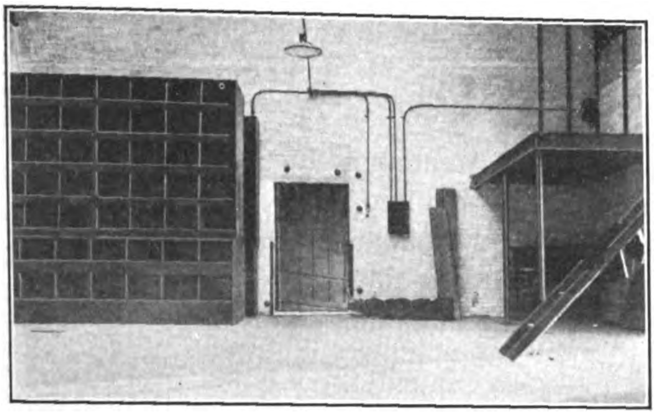
By all means the most striking feature of the Cleveland yard is the huge gantry crane (Figs. 7, 8 and 9) for loading and unloading coal, sand, gravel, etc., and even special work—anything that can be picked up with the clamshell bucket or a magnet. Its capacity is indicated by the fact that it carries a 30-ton counterweight. The cantilever truss is 62½ ft. long from the outer end to the center of rotation and is capable of turning a complete revolution. The legs have a 16-ft. spread both ways. The crane is mounted on eight 30-in. wheels, and a runway 1000 ft. long is constructed across the yard. Each rail is carried on a 2-ft. x 8-ft. concrete bed reinforced with old rail. The 8-in. x 8-in. ties are set into the concrete level with the top and the rail fastened to them with bridge clamps and lag screws.

The crane was built by the Variety Iron Works, Cleveland, and is equipped with four 33-hp. and one 7-hp. Westinghouse 600-volt motors, and a Lakewood Engineering Company 2-yd. clamshell bucket. Its use has introduced great savings in the handling of almost all materials in the yard. The handling of paving block has been found to be considerably speeded up by loading





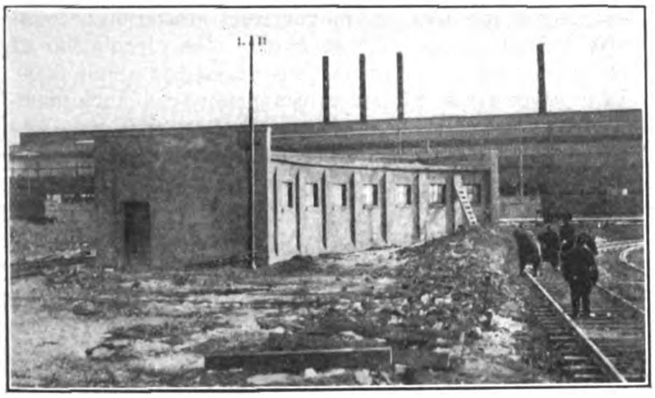
CLEVELAND STORAGE YARD—FIG. 10—CEMENT AND STOCK HOUSE; FIG. 11—PILING SACKS TWENTY-FIVE HIGH IN CEMENT HOUSE



CLEVELAND STORAGE YARD—FIG. 12—STOREROOM FOR SMALL HARDWARE AND TOOLS

the bucket by hand from the car or pile and dumping where desired. This saves one handling, for, when done manually, it is necessary to throw the blocks back after throwing them off the car in order to keep them off the track. The same double handling would be necessary in loading cars for distribution in the city.

The cost of unloading a car of granite with the gantry crane, using one operator and five men on the car, is $3.16, while the cost of manual unloading, using a foreman and twelve laborers, is $4.09. The latter figure does not include the labor cost for throwing the blocks back away from the tracks. Using a derrick and five men, besides the operator, the cost is about the same as with the gantry crane. The gantry crane will unload a gondola of slack coal in twenty minutes, or a carload of wet gravel in forty minutes.



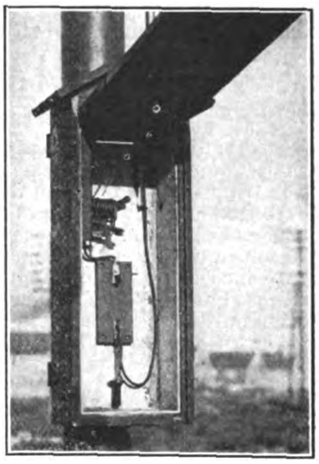
CLEVELAND STORAGE YARD—FIG. 13—SALT HOUSE BUILT ON A CURVE

Other materials-handling facilities in the yard include a 5-ton derrick car (Fig. 5) with a 26-ft. boom, and a 15-ton locomotive crane with a 50-ft. boom about to be ordered. All machines are, of course, electrically operated from the 600-volt trolley supply.

CLEVELAND STORAGE YARD—FIG. 14—OFFICE BUILDING AT ENTRANCE TO YARD

The principal storage building in the yard is the cement and general storage house (Fig. 10). This is a building 250 ft. long by 50 ft. wide, divided into five sections by fire walls. Three sections are devoted to cement storage and two to the storage of hardware, tools, and various materials which need to be sheltered from the elements. The building is constructed of concrete with concrete floor and roof and a large skylight in each section. The floors are designed to carry the extra heavy load of cement sacks piled twenty-five sacks high, as seen in Fig. 11. One of the general storerooms is equipped with steel cabinets and shelving (Fig. 12). Rolling steel firedoors close the openings between sections and those leading out onto the loading platforms. Two Buda elevating-platform, storage-battery trucks of 4000-lb. capacity are later to be installed in the cement house, and it is expected that each one of these will make possible the handling of ten sacks a minute, piling them twenty-five sacks high.

The salt house (Fig. 13) is also an all-concrete building, and is built on a curve to conform to the track curvature at that point. Between this and the cement house, a cement sack cleaner will later be erected. This will be practically identical with the one on the Cleveland property described in the ELECTRIC RAILWAY JOURNAL for Oct. 9, 1915, page 772. Other buildings and machines to be rapidly installed in the yard are a sand dryer, a stone crusher, a splice shed, a drill house, and a long storage bin for track bolts, rivets, tie rods, tie plates, tie clips, etc., extending along one entire side of the yard, as seen on the plan.



CLEVELAND STORAGE YARD—FIG. 15—CIRCUIT BREAKER AND KNIFE SWITCH MOUNTED IN BOX ON POLE

A brick office building (Fig. 14) on the Harvard Avenue side of the yard and at the main entrance is very finely finished and equipped for the use of the yard superintendent, clerical help and laborers. The three offices for the superintendent, bookkeeper and timekeeper are on the second floor and one large room on the first floor is furnished with steel lockers, and with steel tables and benches for the men to use at lunch time. A large washroom is adjacent to this. The building is heated with a Peerless automatic gas heater and hot water is supplied by a Hoffman automatic heater. A large Klaxon horn mounted in the center of the yard and operated from a button in the office provides a ready means of calling the men into the office when wanted.

The yard is to be lighted from the 600-volt trolley supply with 500-watt nitrogen-filled lamps, connected five in series. Twenty of these lamps (Fig. 6) are now installed and more will be put up as the yard is completed. These are mounted on special steel brackets on the trolley poles, and placed high above the top of the pole in order to distribute the light over a wide area. A circuit breaker is provided in the cutout box for each circuit (Fig. 15) in order to prevent the burning of the knife switch.

Advertising Policy of "Aera" Discussed

Reports "Pro" and "Con" Were Considered at Last Week's Meeting of Executive Committee of Association—Three Members of Sub-Committee Appointed to Consider Question Are in Favor of Present Plan—Two Members Oppose Advertising on Principle and as Unfair to Private Initiative

AT the meeting of the executive committee of the American Electric Railway Association held in Boston just prior to the mid-year meeting on Feb. 16 one of the subjects considered by the committee was the continuation of advertising in *Aera*, the association magazine. Ever since the inauguration of the enterprise criticism has been expressed against the solicitation of advertisements for the magazine. This has come in part from the manufacturers themselves, in part from the publishers of technical publications in the field which looked upon the inauguration of a commercial magazine by the association as unfair competition, and partly from officials of railway companies who objected to the plan on principle. In view of this feeling the executive committee passed the following resolution at its meeting on Dec. 20, 1916:

> Whereas, it is the sense of this committee that there is a serious question of principle involved in the publication of advertising matter in *Aera*, and it is the opinion of the committee that the publication of the magazine is of great value to the association, it is, therefore
>
> Resolved, that a sub-committee of the executive committee be appointed by the president to investigate the entire matter and report by Feb. 8 for presentation to a meeting of this committee to be called in Boston, Feb. 15.

The following sub-committee was then appointed to present a report on the subject at the meeting of the executive committee in Boston:

Arthur W. Brady, president Union Traction Company of Indiana, Anderson, Ind., chairman.

John J. Stanley, president Cleveland Railway.

C. Loomis Allen, Allen & Peck, Inc., Syracuse, N. Y.

Timothy S. Williams, president Brooklyn Rapid Transit Company.

Guy E. Tripp, chairman board of directors, Westinghouse Electric & Manufacturing Company.

A DIVIDED REPORT

The report of this committee was presented at the meeting of the executive committee on Feb. 15 in Boston and consisted of a majority and a minority report. The reports of both the majority and minority members of the committee are published below. In view of the fact that the majority favored the continuation of the soliciting of advertising from manufacturers, the executive committee, after discussion, decided to continue that policy for the present in *Aera*.

MAJORITY REPORT

Your sub-committee, appointed pursuant to your resolution adopted Dec. 20, 1916, to investigate and report upon certain matters connected with *Aera*, submits its report as follows:

The publication of *Aera* was begun in August, 1912. Advertising has always been carried except for the period April to December, 1913, during which time an arrangement with the Manufacturers' Association for a contribution in lieu of advertising revenue was in effect. An advertising solicitor has been employed beginning with January, 1914.

The revenues and expenses of *Aera* have been as follows:

For the fiscal year ended Sept. 30 or Oct. 31	Revenues	Expenses	Deficit
1912 (2 months)	$1,832.46	$2,087.57	$255.11
1913 (12 months)	4,561.07	11,550.88	6,989.81
1914 (12 months)	13,305.16	16,779.44	3,474.28
1915 (13 months)	11,813.62	20,757.46	8,943.84
1916 (12 months)	17,728.71	21,742.91	4,014.20
Total	$49,241.02	$72,918.26	$23,677.24

In the revenues stated appear receipts from advertising as follows:

1912	$1,730.90
1913	4,532.74
1914	12,970.00
1915	11,497.10
1916	17,543.24
	$48,273.88

Nothing is included in the revenues stated on account of the subscriptions of members. The circulation of *Aera* among members of various classes is about 5000, and the revenues at $2 per subscription from such members for the fiscal year ending Oct. 31, 1916, was $9,653.70, which, if included in revenues, would have converted the deficit of $4,014.20 for that year into a surplus of $5,639.50.

It is apparent from these figures that the revenue of *Aera* from advertising during the magazine's history of four years and three months to and including October, 1916, was a matter of considerable consequence, and that without it the loss from the publication would have constituted a heavy burden on the treasury of the association. It may reasonably be expected that the same statement will hold good for the future also.

The financial aspect of the matter is thus put forward not because it is controlling, for your sub-committee does not so regard it, but that the problem presented may be fully realized. It may be taken for granted that the association is unable to continue the publication of *Aera* if so doing will entail an annual loss, based on the 1916 figures, of almost $18,000, in addition to a deficit of about $4,000, making a total of $22,000. If advertising be eliminated, the consequent loss of revenue must be made up from other sources, such as an increase of dues, which is probably out of the question, or must be met by a radical reduction in publication expense through a decrease in size and curtailment in scope of the periodical. The problem presented is therefore of a two-fold nature involving on the one hand the continuance of the present advertising policy of *Aera* and on the other the continuance of the present policy of the publication with respect to the scope and size.

Addressing itself to the first phase of the problem, your sub-committee believes that *Aera* is an advertising medium of value. The circulation of the magazine among the various classes of members of the association is about 5000, and a large share of these subscribers are connected with electric railway companies in positions of responsibility. Among these subscribers is a considerable proportion of those who determine or in a few years will determine the kind of apparatus, appliances and supplies which their companies shall purchase. No reason occurs to your sub-committee for questioning the value of *Aera* as a means of bringing such articles to the attention of those men.

Assuming, then, that *Aera* offers a field for profitable advertising, the question arises whether the Association shall permit that field to be occupied and derive a revenue therefrom? Thus far that question has been answered in the affirmative, but the decision thus made is criticised on various grounds.

1—The question is asked whether the appearance of advertising in *Aera* is consistent with the dignity of the association. Your sub-committee does not believe that there is a shadow of reason for criticism on this score. Proper advertising properly displayed, is as fit for the pages of the magazine of the association as it is for the pages of any privately owned magazine, popular or technical.

2—Objection is made that the influence of the association and its members is unfairly exercised to induce manufacturers and dealers in supplies to insert their advertisements in *Aera*. This, it should be noted, is an objection to the method of securing advertising patronage and not to the fact that advertising is taken at all. The objection is, however, most serious, and, if well based and the policy of carrying advertisements could not be thoroughly purged of unfairness of method in securing those advertisements, the policy itself should be abandoned. Very little has been brought to the attention of the committee in support of this objection, and if instances furnishing reason for criticism have occurred, it is believed that they are exceptional and due to an excess of zeal rather than an intention to exert undue influence over any individual or company. Your sub-committee believes, nevertheless, that since this criticism has been made in apparent good faith, positive instructions should be issued, in case the present advertising policy is continued, that the taking of advertising in *Aera* shall be submitted to possible advertisers wholly on the merits of the publication as an advertising medium, and that in particular nothing shall be said or done by any officer or employee of the association to induce the belief that a failure to advertise in *Aera* will be regarded as an exhibition of unfriendliness to the association or the industry which it represents.

3—The objection is made that *Aera* is in the nature of a "jitney"—that is, that *Aera* is an unregulated competitor of the existing electric railway technical press and operated without regard to the economic principles which must govern the operation of a privately owned publication. Closely akin to this objection is another—that the field open to occupancy of the electric railway technical press is so narrow that the present policy of *Aera*, both with regard to advertising and scope, cannot be maintained without seriously hampering the usefulness of the privately owned electric railway publications. These objections combined, present a grave question. Your sub-committee does not, however, believe that *Aera* has been operated on the "jitney" principle. The annual deficits have been recognized and have been paid out of the association treasury in the belief that the association received full value therefor. The duplication of over-lapping by *Aera* of subjects with which the technical press deals does not appear to be serious. The table of matter appearing in *Aera* for the thirteen months October, 1914, to October, 1915, contained in the report of the *Aera* Advisory Committee made in September, 1916, does not seem to have been controverted and may be treated as substantially applicable to subsequent periods. That table shows that out of 1526.75 pages of *Aera*, excluding advertising pages, 68.58 per cent were used for association affairs, question-box and formal matters, and 31.42 per cent, or 478 pages in all, were used for operating questions (including engineering, traffic, transportation, and accounting), public relations and relations with employees. As it is only the latter class of matter which it might be claimed encroached on the publication field of the technical press and as *Aera* is only a monthly magazine of ordinary size page, the question of duplication does not seem to your sub-committee one of consequence.

The freedom of *Aera* from just complaint in these particulars does not, however, determine whether there is a lack of room for both *Aera*, with its present advertising and editorial policies, and other electric railway publications. Your sub-committee realizes the great value to the electric railway industry of such technical journals as the ELECTRIC RAILWAY JOURNAL and the *Electric Traction*. If convinced that the continuance of the present policies of *Aera* would substantially impair the usefulness or growth of those publications, your sub-committee would not hesitate to recommend such a change in those policies as would meet the situation. We cannot, however, conclude on the basis of our present information, that the present *Aera* policies will have the effect referred to. This statement is made after a careful reading of the various briefs, letters, reports and discussions of *Aera* policies which constitute a part of the association's records of the past year.

Your sub-committee believes, for the reasons stated, that no change in the advertising policy of *Aera* is desirable, and so recommends.

The resolution creating your sub-committees perhaps contemplates a report upon the question whether, regardless of advertising policy, a change in the editorial policy of *Aera* is desirable. The only concrete suggestion made is that *Aera* shall be merely a bulletin, confined strictly to association matters and the question-box. Sixty-four pages are stated as the proper size, and the cost of printing and mailing, exclusive of editorial and other supervisory and incidental expense, is given as $6,000 a year. It is interesting to note in this connection that the table in the report of the *Aera* Advisory Committee already referred to shows an average of eighty-three pages per month taken up by association affairs, question-box and formal matters. The space so occupied may be expected normally to grow.

Your sub-committee believes that *Aera* in its present form is a valuable means of arousing and sustaining interest in Association work, thereby, materially benefiting the electric railway industry, and does not recommend any change in the general policy of the publication. Respectfully submitted,

JOHN J. STANLEY,
C. LOOMIS ALLEN,
ARTHUR W. BRADY (Chairman).

MINORITY REPORT REGARDING "AERA"

The undersigned members of the sub-committee, while believing strongly in the usefulness of an association publication and recognizing the value of *Aera* to the members of the association, cannot subscribe to the recommendations of the above report in respect to the propriety and desirability of a continuance of the policy of soliciting or accepting advertising for such a publication. We believe that in permitting such advertising the association's publication is encroaching upon a legitimate field of technical journalism under private enterprise, and that inasmuch as this field is concededly limited in scope and opportunity for profit, the advertising competition of *Aera* is unfair to those whose private initiative has been, and can be, of great service to the electric railway industry. Moreover, even if no improper pressure has been, or is, brought to bear upon manufacturers and sellers of railroad apparatus in the solicitation of advertising, the very fact of such solicitation and the existence of such a medium, contributing as it does largely to the expense of the publication, cannot help being a potent but silent influence in compelling advertisements from those who otherwise would not seek or avail themselves of such an advertising medium. If we are right in this view, then the continuance of advertising involves not only a question of policy but a departure from that high standard of principle to which the association should adhere.

Conceding as we do the necessity of an association publication, we believe that its contents should be confined to reading matter only upon subjects dealing with the association's affairs and reports, and should assume the character of a bulletin rather than that of an electric railway journal.

Respectfully submitted,
TIMOTHY S. WILLIAMS,
GUY E. TRIPP.

Feb. 14, 1917.

Highway Paving by Street Railways

The Paving Burden Laid Upon Electric Railways by Municipalities Is Both Unreasonable and Inequitable

By W. R. DUNHAM, Jr.
Engineer of Maintenance of Way The Connecticut Company, New Haven, Conn.

THE function of a street railway is to provide transportation for the public at a reasonable rate. This implies a reciprocal obligation between the two parties, the public and the company. The company must provide a reasonably adequate service for which the public must provide a reasonable return, which should include all the cost with a fair profit on the capital invested.

BUILDING OF PAVEMENT IS A MUNICIPALITY FUNCTION

It is no function of a street railway company to build streets or pavements for the use of the general public, except under mutual agreement in consideration for locations first granted. The building of pavements is a function of the municipality, or of all the people. In the early days of urban transportation by street railways the motive power was by horse and, although the railway relieved the pavement of wheel wear by running on its own special pavement in the shape of rails, this relief confined the wear of the pavement by the locomotive power to narrow strips along the rails due to the tracking of horses. As this was an added burden or wear confined to a small area, it was fair and just that the company causing it should be compelled to care for it. The condition was recognized in Connecticut and elsewhere by the statutes governing the operation of railways. The statute in this state specifically provides for repairs to pavements within certain limits, being the area between the rails and 2 ft. on the outer sides of the outer rails.

That the statute did not contemplate placing the burden of constructing new pavements on the companies is shown by its wording. It states that repairs only are contemplated, and further, that the highways are maintained by law by the various municipalities. It also limits these authorities to ordering the repairs made with the same class of pavement as that with which the highway is paved, with one exception, which will be referred to later. There is no statute covering the renewal in its entirety of all the pavement on what is defined as the railway area, and it is doubtful if a municipality can compel a company to renew the entire pavement within the limits above described under the statute.

The exception as to class of pavement noted above refers to a strip of pavement 1 ft. wide on each side of each rail. Bearing in mind that at the time the statute was passed the cars were hauled by horses, and that the normal tracking of these horses was close to the rails, the necessity for a harder paving material on both sides of each rail is apparent. Most pavements were of earth or macadam, rapidly worn out by the continued action of the horses' hoofs. It is obvious, then, that this provision was in the nature of a protection, not only to the authorities who were "bound by law to maintain such highway," but also to the company which was bound to keep in repair a certain part of it. This exception permitted a compound pavement, on that part of the highway occupied by the tracks, of a character more resistant to the abrasion of the horses' hoofs. A cobble or block type of stone was permitted along the rails for the footing of the horses, with a pavement between of a character similar to that of the highway as a whole, and so suitable for the vehicular traffic ordinarily to be found on the highway.

"REPAIRS" IS AN ELASTIC TERM

Of late years this statute has been used under a false interpretation of the word "repairs" by the various municipalities, to provide more expensive pavements for all the people at the expense of the railways, a result not intended at the time the statute was passed. This is entirely unreasonable at the present time since, with the general use of electricity for the operation of cars, the wear on the pavement by this railway travel is removed and the life of the pavement is increased, as more people are accommodated by fewer vehicles.

The cost of new pavements thrown onto the companies in this State is enormous, the area defined by the statute to be kept in repair by them being from 33 1/3 per cent to 60 per cent of the total area of the highway. In money cost it means from $300,000 to $400,000 per year, a large sum to be diverted from the proper uses of a company. This, since it brings in no return, must be paid for by diminishing the real accessories of a railway. That is the municipalities are not getting the pavements free of cost, but must pay for them in lessened facilities; as by fewer cars, inadequate power, or some form of poorer service, unless they wish to provide the necessary funds by increased rates of fare.

EFFECTS OF SNOW REMOVAL AND VEHICLE PARKING ON PAVEMENT MAINTENANCE

There is a feature of unreasonableness even in the question of repairs to pavement by railways. During the winter months the companies must, in order to operate, keep their tracks clear of snow and ice. As this cleared area is frequently the only passable part of the highway, all vehicular traffic is confined to it. By law this area must be kept in repair by the company, and yet it is subjected to 20 per cent more wear from use by the general public than the remaining area of the highway, since it is passable and free from snow. On the principal streets also, due to the necessary parking of vehicles next to the curb, 75 per cent of the wear is on the area defined by the statute as subject to repair by the company.

As commonly understood and interpreted, therefore, the paving statute referred to is a most unreasonable one. Its intent should be clarified so that the people as a whole may be informed of the fact that they would be better served if this pavement money was spent for service instead of surface.

A railway company, having installed its tracks and replaced the pavement in the condition in which it was found should not be called on for anything more than such repairs as are due to the presence of its structures in the highway. It should not be expected to renew the pavement in its entirety, unless this is made necessary by the entire renewal of the tracks. If for public improvement it is necessary or desirable to renew the pavement, the public should pay its entire cost. This renewal of pavement often necessitates the entire renewal of the company's tracks, although they may have ten or twenty years of life, and the sacrifice of this life is an economic waste which in the end must be paid for by the public.

The majority of people who depend on the cars for daily transportation should be vitally interested in this matter, as in the end they are the ones most affected adversely. While they are entitled to good pavements they are more entitled to good and reasonable service, and they should insist that the part of the public which does not use the railway, but which utilizes other modes of transit more deleterious to the pavement, should pay for the damage which they cause. The car users should not sit back supinely and pay each year by poorer service for this maintenance, while their neighbors who can adopt more expensive means of transportation cut their costs of maintaining the pavements which their methods of transportation make necessary.

"REPAIRS" VERSUS "RENEWALS"

I want to reiterate the fact that repairs and not renewals of pavements were intended by the legislators at the time the several statutes were passed, as the wording is always "repairs." The statutes in this state were enacted in 1863, revised in 1888 and again in 1893, but in each revision the word "repairs" is used. In these years the modern expensive pavements were not in use, except on the most important streets, but even on these streets the pavement costs were not as high as now. Again, in many instances, the fare was 6 cents and length of ride for the fare was much less than it is at present.

Assuredly, then, no law-making body would intentionally place upon a utility a future burden such as the present misinterpretation of the statutes assume. Neither would they provide free roadbeds for all other modes of transportation at the expense of one, especially when the one relieves the pavement of the wear which the others impose upon it. One car moving on its special track can carry the load of ten trucks, thus relieving the roadway of both congestion and wear, and yet the ten trucks pay practically nothing toward even maintaining the pavements they destroy. By the misinterpretation of the statutes the car must pay not only for the maintenance of the roadway, but for its entire renewal at the whim of municipal authorities. This affords an advantage to its competitors at no expense to them and requires a company to pay for something that is of no use to it, but rather a positive detriment since it increases the cost of any repairs or renewals which may become necessary to its own roadway, that is, its tracks.

THE RAILWAY'S PAVING RESPONSIBILITY

It is, of course, conceded that repairs to the pavement caused by the structures of the company must be paid for by the company. This is fair since it applies to all other occupants of the highway; but that repairs can be construed to mean entire renewal cannot be conceded, for it is neither equitable nor just.

To assume that this paving burden is of the nature of a franchise tax is erroneous, for at least two reasons. It is not equitable to either the municipalities or the companies since the poorer towns, not being able to finance new pavements, get no help except state aid on trunk lines, while the prosperous communities overburden the companies and so get a tax out of all proportion to the value of the franchise. This tax is not assessed at a fair valuation, but rises and falls with the desires for new pavements. In some instances it requires the practical rehabilitation of an entire system in a year or two, thus throwing an unreasonable burden on the earnings of a company, a burden which by any just method of taxation should be spread over a term of years.

PAVEMENT SHOULD BE CHOSEN TO SUIT TRACK

Another feature in the paving question lies in the character of the pavement to be laid on streets in which there are tracks. The type of pavement to be decided on should be chosen for its adaptability to the track and of a kind most durable in combination with it. Once a street is paved it is desirable that the use of that street be as uninterrupted as possible. Hence a type of pavement which will adapt itself best to the rails should be selected, and the rail should be selected not for the pavement but rather for the peculiar highway traffic which it is to carry. In other words, the present form of procedure should be changed by first selecting the most suitable rail, considered as a rail rather than as a part of the roadway, and then getting a type of pavement best suited to fit this rail. In this way the best all-round results will be obtained, the most permanent construction and least disturbance of roadbed will result, and repairs will be reduced to a minimum, not only in the track itself but in the pavement also.

As stated at the outset, the function of a street railway is to sell transportation, not to build pavements. In performing this function it should repair the damage caused by its use of the highway but not renew pavements worn out by the use of others. It should furnish equipment for its patrons but not roadways for its competitors. And it should be allowed to give a fair return on the investment necessary for the proper carrying on of its one and only function.

Interstate Railways' Accident Record

According to the Quarterly Accident Bulletin of the Interstate Commerce Commission for April, May and June, 1916, 446 persons were recorded as having been killed and 4574 injured on interstate electric railways during those months. Out of 3414 persons, the nature of whose injuries were recorded, 1911 persons were passengers on passenger trains, one person was a passenger on another train, four persons were carried under contract, 459 were employees on duty, three persons were employees not on duty, 103 were trespassers and 983 were other persons not trespassers. Recorded damages from collisions and derailments amounted to 62,649 in 1915 as compared with 131,558 in 1914 and 211,777 in 1913.

Wage Arbitration and Contracts*

Public Is Interested in Uninterrupted Service Under Labor Contracts Arising with New Economic Thought—Arbitration Not Being Satisfactory, Public Supervision of Relationship Between Employer and Employee Seems Desirable—Question of Using Commissions for This Work Deserves Serious Study

By BENTLEY W. WARREN
Boston, Mass.

EXCEPT in isolated instances, public regulation has entirely neglected the relations between the carriers and the army of human agents through whom the carriers conduct their public service and for whose individual action the carriers are by law made responsible. Even in the few exceptional cases, as in limiting the hours of employment or in requiring the use of various safety devices, the regulation is usually due to considerations, actual or alleged, of public safety and not, as in the case of the regulation of financial activities of the carriers, to considerations affecting the cost of the service.

REGULATION OF UTILITY LABOR HAS NOT BEEN THOUGHT NECESSARY

Doubtless the lack of governmental attention in the past to this important feature of transportation has been due to the belief that it was unnecessary. It was assumed that the self-interest of the utility managers, who represent the investors and seek to insure a return to them upon their investment, would result in the selection of the most competent employees available and at the lowest wages which would be acceptable in an open labor market. It may have been supposed that the ordinary operation of the economic law of supply and demand would prevent any undue or avoidable burden upon the public in the form of wages or other concessions to the employees. This economic law is still to some extent operative in many lines of industry. Wages are seen to rise and sometimes, though with decreasing frequency, to fall under changed industrial conditions. To the same extent this condition might be true in the case of carriers, if the public had no more interest in transportation service than it has in the product of an ordinary mercantile or manufacturing establishment.

In cases of the latter kind the public can usually await with equanimity the settlement of a wage dispute between capital and labor. Even in such cases, however, the public interest cannot and, as shown in the coal strike of thirteen years ago, will not wait if the dispute becomes country-wide and affects a prime necessity of life. This condition always exists in the case of all street railway transportation conflicts. The controversy does not need to be country-wide or state-wide; to the public of the particular community served by the particular carrier the conflict, if permitted to reach the stage of an interruption of service, is as disastrous as a country-wide interruption might be to the country as a whole.

PUBLIC SANCTIONS COLLECTIVE BARGAINING BUT DEMANDS UNINTERRUPTED SERVICE

With the recognition of the reasonableness of collective bargaining every controversy between a carrier and its employees involves not merely a possibility, but almost a certainty, of an interruption of service if it remains unadjusted. Collective bargaining implies collective quitting of work. There is no collective labor body to take the place of the collective body which suddenly quits work. Consequently, if the controversy is not adjusted and the employees withdraw in a body the public service must necessarily be interrupted. Ultimately the places of the employees might be filled by equally or even more competent men and at the same or even lower wages, and under working conditions which might insure to the public better service for the money which they pay through the agency of the carrier to those men. In the public estimation, however, these considerations seldom weigh against the inconvenience of partial, irregular and uncertain service during the interval of adjustment.

Not only does the more recent economic judgment of the public sanction collective bargaining; it also, to a considerable extent, approves, if not actively supports, efforts to better the conditions of the workingman and to relate his wages to a higher standard of life than mere subsistence. It is noticeable of late years to what an extent the question "What can a man be hired for?" has been relegated to the background, and in its place has been substituted the question, "How much ought this man receive to insure to himself and his family a decent and reasonably comfortable existence?" Probably the adoption of these changed views is desirable, and their general acceptance will conduce to the advantage of the community. They terminate, however, as far as public service corporations are concerned, the old standards of individual employment. The managers of such corporations must recognize these new views, and in the main have done so.

LABOR CONTRACTS AND INTERESTS OF PARTIES THEREIN

Both the carriers and their employees have become conscious of the difficulties which the adoption of new economic opinions has produced. They have sought to minimize these difficulties by so-called contracts between the carrier and the body of its employees, the latter usually acting as members of a union through selected officers or representatives.

Whenever such a contract is to be negotiated, the employees' chief interest is in the wages to be paid, the working conditions under which their labor is to be performed and the security of their positions. In the development which has taken place in the negotiation of such contracts, and the concessions which have already been obtained by labor, the employees' interest to-day is, more specifically, in securing direct wage increases and various indirect increases through modifications of the working conditions.

The carriers' interest, like that of the employees', is in wages, but to keep them stationary; in the working conditions, but to prevent their use to secure indirect increases in wages or, which amounts to the same thing as far as the treasury is concerned, in increased cost of operation; in the maintenance of discipline, and in the freedom of transportation service from interruption.

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*Abstract of paper presented before the American Electric Railway Association mid-year convention at Boston, Mass., on Feb. 16, 1917.

The public is interested in the quality and extent of the transportation service, which is largely dependent upon the character and skill of the employees; in the freedom of that service from interruption, which again is almost entirely dependent on the character and conduct of the employees and upon their refraining from resort to a collective withdrawal from service; in the cost of that service, which each year is becoming increasingly dependent upon the wages of the employees, and in the safety with which the service is conducted, which again is dependent upon the character and skill of the employees, upon their working conditions being not unduly burdensome, and upon the efficiency of their discipline.

WHAT LABOR CONTRACTS SHOULD INSURE

Such contracts should be definite and clear in their terms. They should insure adequate and proper service for the public; adequate and certain compensation for the employees; safety of operation, which necessarily involves and assumes a power of discipline in the management's control; and freedom from interruption, which necessarily involves prohibition of wholesale discharge of employees by the company and of strikes by the employees.

Labor contracts, to secure the results to which the public is entitled, should absolutely prohibit strikes under any circumstances during the term of the contract, and should similarly prohibit reductions by a carrier in wages or changes in any other terms of the contract agreed to by the carrier. They should provide that all discipline should be retained in the hands of the management. The writer has seen few contracts which contained a prohibition upon strikes, and has known of cases where such a prohibition was suggested by a carrier and its insertion was refused by the employees. While some earlier contracts did retain in the management the control of discipline, many if not most of the more recent contracts provide for the arbitration of all grievances, including those arising in the attempted exercise of discipline. There have been several instances of strikes during the continuance of a labor contract, and perhaps the most frequent cause of such strike has been a grievance arising from a carrier's attempt to enforce its discipline, although the carrier would arbitrate the justice of the penalty imposed.

ARBITRATION IS NOT ENTIRELY SATISFACTORY

Both the carriers and their employees are conscious of the increasing difficulties which beset their attempts to negotiate and carry out satisfactory contracts. Both are also conscious of the interest in such contracts of the unrepresented public, and especially of the interest of that public in the uninterrupted regularity of the service. Notwithstanding this recognition of the difficulty, they have never been able to agree upon a method to admit the representatives of the public to their negotiations, or to delegate either to the courts or any other constituted public authority the final decision in matters upon which the carrier and its employees fail to agree.

The solution usually attempted is settlement through three arbitrators, one selected by the carrier, one by the employees and the third by those two. While no one would say that this method does not represent a commendable effort to save the public from an interruption of service, it is probably true that no representative either of a carrier or of its employees, who has had experience with such arbitrations, would say that the method is satisfactory. It is difficult to settle the questions to be arbitrated, to select the third arbitrator and to educate this practical judge up to his work. Always an unreasonable amount of time is consumed, and great expense is incurred under the present method of arbitration.

GIVING THE PUBLIC A SHARE IN THE SETTLEMENT

So far as the writer is aware, the public has never been officially represented even at the formal hearings in a street railway arbitration. The awards of such arbitrations have no binding effect upon the public or the representatives of the public who are charged with the regulation of rates. Such public officials are at liberty entirely to ignore the effect upon the carrier of an increase of wages awarded by an arbitration board. The courts not only can, but must, ignore the reinstatement by such a board of an unskillful and incompetent employee. In the one case the company is compelled to pay the increased wages with no right to secure increased income with which to do so; in the other the company is compelled to pay in damages for the results of the incompetence and lack of skill of an employees whose employment it could not prevent.

It would seem that any well-considered scheme for supervision and regulation of street railways should cover the relation between the carriers and their employees. If public supervision of this relationship is desirable, the public tribunal to be used—it would first occur to a student of the question—would be the same tribunal as that already entrusted with the supervision in other respects of such carriers. That there would be certain and very great advantages in such a selection is obvious. The existing supervising bodies, by the very nature of their present duties, are familiar with the general subject of transportation, with the financial condition and ability of the companies, and with the peculiar requirements of the service. They, therefore, could easily determine the effect both upon revenues and upon service of any proposed changes in the relations between carriers and employees.

As an appellate body with final authority to deal with the vexatious and frequent questions of individual or collective grievances and discipline, a commission could exercise that authority intelligently and with due regard to the safety and efficiency of operation in each case. Responsible as such a commission is for promoting the safety of the public, the carrier would be justified in accepting the decision of this body that a given employee ought to be reinstated as conclusive evidence that the carrier's managers had been wrong in discharging or otherwise disciplining such employee. The innumerable controversies over details, the unreasonable delays and the great expense involved in the present system of arbitration would disappear. Either the carrier or the employees could take any disputed matter at once to an authoritative tribunal and could expect a speedy, definite and final determination.

Whether the time has not come for appropriate legislation to vest the public service commissions with jurisdiction over the relations between the carriers and their employees is a question deserving most serious consideration and study. The question is so large and has been so recently raised that I am not prepared at this time to express a definite opinion. I believe, however, that it is bound in the near future to require an answer. It is significant that the Public Service Commission for the First District of New York has already advanced tentative suggestions looking to such an extension of its powers. Those suggestions, in my opinion, merit careful study.

During the year 1916 on the interurban lines of the Detroit (Mich.) United Railway 277,807 orders were issued by train dispatchers. This was an increase of 50,248 over the number issued in 1915.

Practical Results in Publicity Campaigns

Three Cases in Which Crooked Politicians Were Outwitted by the Railway Managers

By CHARLES T. HEASLIP
New York City

[*In the first case the mayor of a certain city, in an effort to control the labor vote, promised co-operation in a proposed strike. Exact information, put before the public frankly, checkmated him. In another case the manager "called the bluff" of a labor-dominated mayor during a strike crisis. These sentences epitomize the third case: Politician—"You know we're not in politics for our health." General manager—"Neither am I running a sanitarium for grafters—now get out before I throw you out," and then the G. M. gave the public some information regarding the type of men who were in office.*]

IN the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 27, 1917, page 153, two examples were cited to show how the unscrupulous or misguided "reformer" could be and had been circumvented. These examples involved the use of public speaking for the purpose of neutralizing the tirades of the "reformers." It is not when the reformer or politician foe takes the stump against a corporation, however, that he is most dangerous. He is at least out in the open then, and if the company meets him there and presents its case promptly, honestly and fully the public will usually return a fair verdict. It is when he quietly injects himself into the labor troubles that arise ever and anon in the public utility field that he becomes a real menace—even to the most honestly conducted corporation. Organized labor is quick to take advantage of political support, and when both the unions and the politicians are lined up against a company it has to have a wonderful reputation for fair dealing in the community which it serves if it is to come out unscathed.

An incident illustrative of this fact occurred about two years ago in a town which boasts one of the best managed street railway companies in the country. This company was giving good service and stood high in the estimation of the community. It paid good wages and treated its employees fairly. Under such circumstances it may be difficult to understand why its general manager should have found himself confronted one day with labor trouble among his trainmen. Such things do happen, however, and will continue to happen until the best brains in the ranks of capital and labor get together and devise some fair method of settling disputes without either side bringing in "advisers" from the outside.

The troubles of this particular company were brought to it from the outside. The state in which it operated was upset generally by industrial strife at the time, and an organizer from one of the national trainmen's unions took advantage of the general state of unrest to organize a "local" among the conductors and motormen. The general manager made no move to block the organization of the "local," and about 60 per cent of his men joined it. But when the inevitable list of demands was presented to him a week later, he called a meeting of all his trainmen, both union and non-union, and gave them a heart-to-heart talk. He called attention to the fact that he and all the other company officials had always been willing to meet with them, either individually or in a body when differences arose, and that all past differences had been settled satisfactorily. He added that it was the company's intention to continue this policy, but that it was also its intention to maintain an "open shop."

"Therefore," he said in conclusion, "if you men will get together as a whole and appoint a committee that will be fairly representative of all of you, both union and non-union, I shall be glad to meet that committee and make whatever adjustments are fair to both sides."

It is probable that this offer would have been accepted by the men if the union organizer had not approached the mayor and urged him to use what influence he had to force the company to recognize the newly-formed union. He called the mayor's attention to the strength of the labor vote and intimated that any favor he could do for the "street car boys" would be appreciated by all the voters in the ranks of organized labor.

The proposition pleased the mayor, but he was too crafty a politician to come out openly against the company. He compromised by addressing a secret meeting of the "local," and promised the men that if they forced an issue by calling a strike he would see that no police protection would be given to the company's property. He also promised to frame up some emergency legislation that would prevent the company from using any strike-breakers.

The general manager of the street railway corporation was a man of more than ordinary ability in handling delicate situations. He did not approve of a street railway or any other large employer of labor carrying its difficulties with its employees before the public, as publicity in such cases only tends to rouse a factional spirit and to make the issues more difficult of settlement. But when he learned that the mayor's support was being taken seriously by the men, and that there was talk of calling a strike on the approaching Fourth of July unless the company recognized the union, he decided to force the issue at once. He knew that he and his company had the respect of the community and that it would give him a fair hearing on any subject which involved both the company and the public. So he bought a full page of advertising space in each of the local newspapers. Here he announced that some of his conductors and motormen were talking of going out on a strike on Independence Day, and as traffic was usually heavy on holidays the company thought the people ought to know about this so they could arrange their plans accordingly.

This announcement was supplemented by a brief and truthful review of the events leading up to it (excluding the part which the mayor had played), and also by a statement of the company's side of the case. In conclusion the general manager stated that his company stood ready to make any fair adjustment of the differences that had arisen between it and its dissatisfied employees and trusted the public would be spared the inconveniences of a strike.

This advertisement threw both the agitators and the mayor into a panic, and the latter's panic increased when the general manager visited him and told him quietly that unless he ceased meddling with the private problems of the company, another advertisement would be published which would deal exclusively with the part the city's chief executive was playing in encouraging a situation that might result in riot and disorder. The newspapers and the chamber of commerce then took up the matter and, by indorsing the original plan of settlement submitted to the men by the general manager, showed the union that it could expect little public support if the agitators persisted in forcing a strike. The mayor, meanwhile, seeing which way the "cat was jumping," promptly came out for "law and order."

The upshot of the matter was that inside of forty-eight hours the more level-headed of the union men got together and voted down the strike idea. A few days later the general manager's offer of mediation was accepted and all differences were satisfactorily adjusted.

A CASE IN WHICH CORDIAL PUBLIC RELATIONS HELPED OUT

Sometimes in an effort to secure or keep the labor vote, politicians will attempt even cruder tactics than have just been outlined. If, however, the head of the corporation that is being menaced is sure of his company's standing in the community he can sometimes outwit them. The following is an instance.

Several years ago a street railway strike was in progress in a coast city where the mayor was completely dominated by the labor agitators. He called the general manager of the traction company over to the city hall on the day the strike started and warned him that if he attempted to put strike-breakers on the cars the chief of police would be ordered to have them shot down on sight.

The general manager, who was an Irishman, wet his lips and pushed back his coat sleeves nervously when this ultimatum was delivered to him. Then, controlling both fists and brogue with an effort, he turned to the mayor and spoke as follows:

"Is thot so? Well, thin, you'd better tell your chief and his min to have their insurances paid up, because my cars are goin' to run to-morrow with stroike-breakers on thim—and they're goin' to have guns—and they're goin' to shoot those guns at the first copper who raises a gun to thim. If you want civil war here you're goin' to get it!"

But there was no civil warfare the following day. The mayor was not a good poker player.

OUTWITTING THE "GRAFTER"

Another rôle which public utility men have discovered the crooked politician is prone to adopt is that of "grafter."

Nearly any idea for an ordinance that will tend to embarrass a company or cause it to spend large sums of money on so-called "improvements" or "extensions" that are not really needed can be used by him as a lever to extract some graft from the corporation affected if its officials are at all cowardly.

In the old days, before the corporations learned that the public did not want to stand for a crooked politician any more than it did for a crooked corporation, it was easier for the grafter to terrorize the public utilities than it is to-day. This is shown by the following illustration.

Seven years ago the "collector" for the mayor of a city of 40,000 population went to the general manager of the local street railway and showed him the advance copy of an ordinance which, if passed, would compel him to rebuild the company's double-track loop in the heart of the city at an expense of about $20,000.

"It will cost you $5,000 to prevent that ordinance from getting over," said the collector, bluntly.

The general manager, who was a good lawyer as well as an operator, read the proposed measure carefully and then shook his head.

"Nothing doing," he said. "Our franchise rights have precedence over that ordinance."

"All right," said his visitor cheerfully, "then we'll attack the validity of your franchise."

They did this so effectively that the company had to spend $25,000 and fight in the courts for three years to protect its stockholders from the depredations of a crooked mayor and a thieving council.

The general manager did not ask for the co-operation of the public in that fight, nor did he attempt to "show up" the politicians who were behind it. He did not figure that it would do any good. Last year, however, when another effort was made to coerce him into crossing the palms of some political grafters he tried an experiment. He dealt the public a hand in the game.

The chairman of the highway commission in a town through which his principal interurban line ran had approached him with an offer of a private right-of-way through the main street of the town "for $5,000." Now, the general manager did not want such a private right-of-way, and, moreover, even if he had wanted it the highway commission did not have the power to grant it. Property owners along the line could have blocked it by injunction proceedings. He called this to the attention of his visitor, who was also political "boss" of the town, and the latter admitted that this might be true. But he insisted that he and "the boys" needed $5,000 anyway.

"You know we're not in politics for our health," he added.

"Neither am I running a sanitarium for grafters," said the general manager. "Now get out before I throw you out!"

The chairman got out, muttering threats of revenge, and the following week the council of his town passed an ordinance compelling the railway company to stop its "limited" cars at all crossings within the town limits instead of at only one street as before.

The general manager decided then that an opportune time had come to let the citizens of that town know the type of men they had voted into public office. As a special favor to the town he had instituted, the year before, an "owl car" service between it and the city in which his local lines operated. This had become very popular, especially with the theater-going inhabitants. Knowing that a public clamor would be raised if this service was abandoned, and appreciating the opportunity which such a move would give him to expose the grafters, he seized it and announced that the "owl car" service would be discontinued until the town council saw fit to revoke the ordinance which had upset the "limited" service on the interurban line.

This was an effective counter blow and resulted disastrously for the grafters, for in the investigation that followed other petty acts of the town's political crooks were uncovered and a general house-cleaning followed.

Cartoon Series of Editorial Talks

The ELECTRIC RAILWAY JOURNAL has republished in pamphlet form the cartoon series of editorial talks, twelve in number, published in this paper from Oct. 7, 1916, to Dec. 23, 1916, inclusive. Copies of this reprint will be sent to any subscriber upon application as long as they last. The set was reprinted because of the interest expressed in these cartoons and the desire of a number of readers to have a complete set in convenient form.

American Association News

Plan for Affiliated Association for Manufacturers Presented at Boston—Signal and Claims-Transportation Committees Held Profitable Meetings This Month—Records of Two Recent Company Section Meetings Are Given

Status of Manufacturers

Report of the Sub-Committee on the Subject Was Presented at Boston

The report of the sub-committee of the executive committee of the American Association, appointed by President L. S. Storrs on Dec. 20, 1916, was presented to the executive committee at Boston. It recommended the organization of an affiliated association which would have five representatives on the executive committee and would take full charge of the exhibits and have such other duties as might be assigned to it by the president and executive committee. The sub-committee also recommended that representatives of manufacturers be appointed to membership on the committees of the parent and affiliated associations in the same way that railway men are now appointed. The committee consisted of Guy E. Tripp, E. W. Rice, Jr., S. M. Curwen, Thomas Finigan and James H. McGraw, chairman.

At the meeting of the executive committee of the American Association on Feb. 15, as mentioned in the issue of last week, it was decided to refer the report back to the sub-committee with recommendations of the executive committee for further consideration.

Joint Committee Discusses Block Signals

A meeting of the joint committee on block signals was held in the William Penn Hotel, Pittsburgh, Pa., on Feb. 2 to receive reports of the various sub-committees appointed at the Newark meeting. The members of the committee present were J. M. Waldron, New York City, chairman; J. W. Brown, Newark, N. J., co-chairman; J. B. Stewart, Jr., Youngstown, Ohio, J. J. Brennan, Fort Wayne, Ind., G. K. Jeffries, Indianapolis, Ind., R. C. Johnson, Brooklyn, N. Y., and John Leisenring, Peoria, Ill. The visitors present by invitation, representing various signal manufacturers, were: R. V. Collins, West Newton, Mass., S. M. Day, Rochester, N. Y., H. W. Griffin, New York City, and L. F. Howard and Earl Saunders of Swissvale, Pa.

The subject of standards was first discussed. With regard to automatic block signals for high-speed interurban service, investigations showed that the principal objection that had been raised to the requisites as outlined in the 1916 report was in the improper wording of the first requisite. At present the wording is: "Signals of prescribed form, indications given being in not more than three positions, by lights of prescribed color or by both." The sub-committee was advised to submit informally a revision of this requisite to the standards committee and ascertain if possible how any further objections could be met. With a view of harmonizing standards common to steam and electric railways, it was intended to make the revised wording conform to those formulated by the American Railway Association and the Railway Signal Association.

On the subject of the use of continuous track circuits for control of signals for high-speed service, it was decided that the standard as now contained in the Engineering Manual be eliminated and the matter be covered by requisites of installation. The addition of explanatory notes to the requisite was recommended for the help of members of the association not familiar with terms used in signaling.

Considerable discussion was given to the subject of block signal operation on roads signaled from end to end, this investigation covering maintenance costs, efficiency and effect of traffic. It was thought that the phrase "from end to end" limited the number of roads affording data, and the committee decided to use data obtained from roads using block signals over parts of their routes to show possible results for the case of a road signaled throughout its entire length.

The subject of the operation of trolley contact type of signals will be considered further by the sub-committee. Forms for aspects were submitted and tentatively adopted which are similar to those used with track circuit light signals excepting the cautionary indication. A note was added stating that, when used exclusively on single track, a single yellow light will indicate that a car is in the block proceeding in the same direction. Where car-spacing signals are used, two yellow lights will indicate that the next signal is at danger. Where both track circuit and trolley contactors are used, both red and yellow lights will be used to indicate caution. The sub-committee will submit copies of the proposed aspects to all manufacturers of trolley contact signals.

It was recommended that the work of referring to the Railway Signal Association plates showing apparatus applicable to electric railways be continued but that these should not include specifications for transformers until definite specifications have been decided upon. It was thought that reference to the plates should be made with caution especially in the cases of apparatus the design of which is not yet standard.

Progress on other assignments was reported and the chairman appointed another sub-committee to investigate the co-ordinate work of previous committees according to topics.

It was decided to hold the next meeting in Chicago on March 19.

Joint Committee on Claims-Transportation

Co-operation between claims and transportation departments in reporting accidents and in preventing them was the topic discussed at the meeting of the committee held in New York City on Feb. 1, 1917. The meeting was attended by H. A. Bullock, Brooklyn, N. Y., chairman; H. D. Briggs, Newark, N. J.; A. G. Jack, Chester, Pa., and E. L. Lindemuth, Wilkes-Barre, Pa. In view of the similarity of subjects assigned to this committee and those under study by the electric railway section of the National Safety Council, and of the fact that many railways belong to both associations, it was decided to work in conjunction with the safety education and safe practices committees of the N. S. C. electric railway section. The ways in which this will be done are as follows:

An attempt will be made to get railways to make slides and motion picture films available to members in accordance with the plan discussed at the N. S. C. Detroit meeting, but only American Association members not in the N. S. C. will be approached. Messrs. Lindemuth and Jack were appointed a sub-committee to prepare a report on safety education methods, with respect to expense and conditions under which typical methods had proved successful. For this work the material collected by the N. S. C. will be available. The chairman stated that the safe practices committee of the N. S. C. electric railway section is working out a plan of safety organization adapted to various conditions, namely to roads having union or non-union employees, willing to make liberal or only limited expenditure, etc. The joint committee believed that this would be appropriate as an appendix to its 1917 report.

The committee agreed that all information obtained by claims departments, excepting names and status of witnesses outside of the companies' employ, should be turned over to the transportation departments, and that names be furnished if desired in special cases when this can be done without prejudicing the companies' cases in court.

Messrs. Bullock and Briggs were appointed as a subcommittee to work out a set of inter-department forms to be used in carrying out this plan.

Capital Traction Company Section

The meeting of Section No. 8, held on Feb. 8, was addressed by Elon Von Culin, superintendent of traffic. He spoke of the work of the transportation and traffic departments, covering schedule building, traffic studies, and causes and prevention of delays in service. Some charts and tables were used to illustrate the talk after which followed a general discussion. Several members of the Washington Railway & Electric Company Section were guests, some of whom also gave short talks. Entertainment for the evening consisted of several vocal and instrumental selections. The number of members and guests present was 114.

Milwaukee Section Meeting

The regular meeting of the Milwaukee Company Section was held on Feb. 8. L. G. Riley of the Westinghouse Electric & Manufacturing Company addressed the meeting on "The Latest Development in Electric Car Control." He used slides to illustrate various details and reviewed the different types of car control which preceded the present multiple-unit system as installed on the Milwaukee company's new center-entrance cars. Following the talk by Mr. Riley the company section orchestra rendered several selections, after which the much-talked-of moving picture "King of the Rails" was shown. About 250 were in attendance.

The usual review of the technical press, dated Feb. 8, 1917, has been sent out to members of the section.

Preparedness Poster

The conference committee on national preparedness, of which Henry A. Wise Wood is chairman, has prepared a poster giving statistics of the army and navy with a statement of the needs of the country in both of these directions. The poster is 27 in. x 42 in. and has been issued to educate the public on the needs of national defense. Copies will be sent without charge to any electric railway company which wishes to display these posters in its waiting rooms. The conference committee may be addressed at 32 East Forty-second Street, New York.

For a number of years past the Fishkill Electric Railway has followed successfully the practice of giving $3 a month bonus to every platform man who shows a clean slate as regards obedience to the rules.

COMMUNICATIONS

Suggestion on Truck Standards

CHICAGO ELEVATED RAILWAYS

CHICAGO, ILL., Feb. 8, 1917.

To the Editors:

I have been greatly interested in reading the article entitled "Truck Classification," by Mr. S. A. Bullock, which appeared in the ELECTRIC RAILWAY JOURNAL, for Feb. 3, 1917. I believe that a standard classification is very desirable and would be of great benefit to the operating mechanical department as well as to the truck manufacturer. The classification which Mr. Bullock has worked out seems to answer the purpose.

I notice that the last figure represents the carrying capacity of two trucks expressed in thousands of pounds. There is a question in my mind why Mr. Bullock uses the carrying capacity of two trucks instead of one truck. In cars where the two trucks are exactly the same this would probably not be an important point, but many subway and elevated cars are constructed with a motor truck under one end and a trailer truck under the other end of the car. While in general the center-plate load on the two trucks is approximately equal, the other characteristics of the two trucks are usually entirely different, and it appears to me that it would be better to have the last figure in the classification show the maximum carrying capacity of one truck in thousand pounds as all other figures and symbols in the classification refer to one truck.

H. A. JOHNSON, Master Mechanic.

Regenerative Braking of Electric Vehicles

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY

EAST PITTSBURGH, PA., Feb. 7, 1917.

To the Editors:

I have read, with interest, the abstract of my paper on "Regenerative Braking of Electric Vehicles," given in your paper, as well as your editorial and the abstract of the discussion of the paper. The abstract of the paper proper is indeed a very correct, complete and concise statement of the subject matter brought out in the paper. There is only one statement which is slightly in error, on page 112, to the effect that with the Lake Erie & Northern locomotive, the same connections are used for both motoring and regenerating. This is not quite correct in so far as the motors are in this case handled as straight series motors during acceleration while they are separately excited during regeneration. As mentioned in the paper, however, it would be possible to use the regenerative connection for motoring by making only very slight changes.

In quoting my remarks made in closing the discussion, you mention in your abstract my stating that I expect railroad men will come to see that the constant-speed motor is what they want. This statement should be somewhat qualified as follows: In considering what is desirable for the railway, it is necessary, first, to find out what is the ideal from a pure transportation viewpoint; and second, how closely such an ideal can be obtained without sacrificing reliability of service and equipment, as well as efficiency, etc. I am of the opinion that from a purely transportation point of view it is most desirable and efficient to operate a train over a certain piece of track all the time at the maximum speed which is safe for this particular piece of track and for the equipment. It is further desirable that in accelerating, the speed of the train be brought up to this speed as quickly as possible. This means that it is desirable to have a maximum permissible accelerating torque until the maximum speed is reached. In other words, straight-line acceleration up to the maximum speed is desirable. In bringing the train to a standstill it is desirable to have straight-line retardation with the maximum permissible braking torque. Putting the above in ordinary language means that it is desirable from a purely traction point of view to reach a maximum permissible speed as quickly as possible, then to continue running at this constant maximum speed as long as possible, and to finally stop the train in as short a time as possible. It cannot be doubted by anyone that this will give the maximum efficiency of the track. Since the maximum permissible speed is, of course, different for different pieces of track and with different car equipments, it may be necessary to adjust the constant speed for different values under different conditions. In other words, it may be desirable, or necessary, to have an adjustable constant-speed characteristic. The only question which is difficult to decide is whether it should be possible to adjust the constant speed for two, three or more different values.

There are, of course, other points which are of importance from a transportation perspective. It is undoubtedly desirable to have enough margin for making up time to a certain extent. In the writer's opinion, this can best be provided by introducing a period of coasting, which incidentally has the advantage of giving more economical operation with regard to power consumption. Special attention should be called to the fact in this connection that the possibility of making up time by shortening the coasting periods exists alike no matter whether a constant or variable-speed motor is used for acceleration, assuming, of course, that in either case the maximum rate of acceleration and braking available with the particular equipment is being used, as is usually the case.

As previously mentioned, however, it is also of importance that whatever is ideal from a transportation viewpoint be obtained safely and efficiently, and wherever this is not possible it is perfectly justifiable to sacrifice a certain amount in track efficiency in order to obtain reliability. For this reason, the use of the variable-speed series motor is fully justified, although it does not give ideal conditions from a traction point of view. The strong point of the series motor is that it is to a very large degree self-protecting—infinitely more so than the constant-speed direct-current shunt or compound motor. The great successes achieved in traction work by the series motor are, therefore, not due to the fact that this motor is ideal from a traction standpoint, but rather to its great reliability as compared with the shunt and compound motors. As soon, however, as there is a type of motor available which is both reliable and adapted to give adjustable constant speed, there is no doubt but that such a motor should be preferred by the railways. This ideal is most closely approached by the induction motor in all cases where a limited number of constant speeds is satisfactory. There is no doubt but that adjustable constant-speed characteristics of locomotives may also be obtained in time with commutator motors for both direct current and alternating current as the art advances, although certain difficulties have to be overcome in this connection.

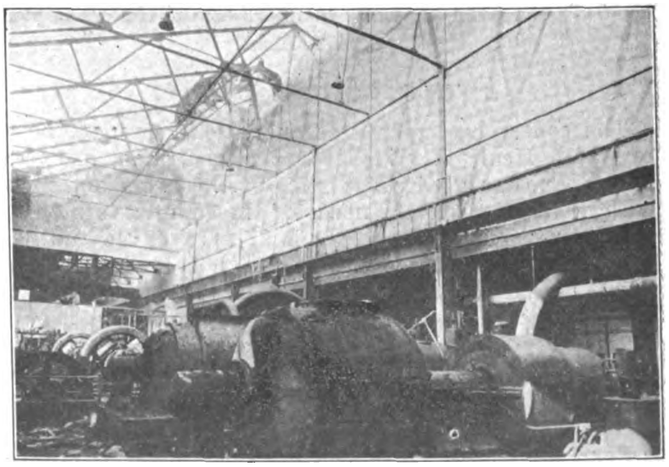
With regard to your editorial, in which it is stated that it is a long cry from the present applications of regeneration to trunk lines, to the use of the principle on the motor cars of city and interurban railways, I cannot fully agree. Your argument that first cost and cost of maintenance are most important surely does not apply if additional costs are more than paid for by the savings made possible with regenerative control. The arguments advanced with regard to complication are only applicable within certain limits and depend largely upon the perfection of the additional apparatus. There is no doubt, for instance, but that an air brake with its compressor, compressor motor, air tanks, piping, and valves is infinitely more complicated than a hand brake, and yet nobody doubts nowadays that air brakes should be applied in a large majority of cases. It should not, therefore, by any means be concluded that the addition of a small exciter machine would make regenerative control for city cars prohibitive. The writer is convinced that regenerative braking will be used for such service eventually, although it may not be possible to recuperate as much as 60 per cent of the energy as mentioned in your editorial. Even if it is true that 60 per cent of the power is used for acceleration, it should be considered that a large part of this energy is regained without regeneration by coasting and that regeneration does not give 100 per cent efficiency. Therefore, in most cases it will hardly be possible to regain more than 20 per cent by regeneration. This amount will be about the same with the exciter and the booster system for reasons pointed out in my paper.

R. E. HELLMUND,
Railway Engineering Department.

Service Quickly Restored by Railway After Fire

The illustration below shows effects of the fire of Jan. 6, that destroyed some of the buildings and rolling stock and damaged the power plant of the Eastern Pennsylvania Railways at Palo Alto, and of which mention was made in the issue of this paper for Feb. 10, page 272. Enough of the power generating equipment escaped serious injury so that partial service was maintained, and with diligent efforts of the officials and employees, and help from neighboring companies, full service was soon restored.

The storehouse with all of its contents was destroyed and the building which was formerly a paint shop is now used for storing new supplies. The carhouse was also destroyed and contained twenty-one passenger and service cars at the time of the fire. A temporary repair shop has been erected beside the fireproof blacksmith shop, which was only slightly damaged. About 1100 ft. of track with a cinder covering in a new section of



INTERIOR OF EASTERN PENNSYLVANIA RAILWAY'S POWER HOUSE, SHOWING DAMAGE BY FIRE the carhouse was saved, and over this portion a temporary shelter was built after the fire for making car repairs.

The power plant consists of an old and a new portion, adjoining with no partition wall. This building remains intact, the new part having a tile roof, and damage to equipment was done by water and by falling embers from the roof of the old section. The two turbo-generators of 1000-kw. and 3250-kw. capacity were disabled by broken gages, oil pipes, etc., and damaged by water, but have been repaired and put back in service. Two motor generator sets, a rotary converter, arc lighting circuit, and a transformer which supplied power for plant lighting and for the carhouse were only temporarily disabled, but a direct-current switchboard and two old-style engines and generators used to supply power for the railway peak loads were destroyed. Sheet iron and other material put over the exciters during the fire saved them from damage.

Two Corliss engines and generators supplied all power for about forty-eight hours. During the time when the turbine units were out of order some energy was obtained from the Lehigh Navigation Electric Company. Three 500-kva. transformers were brought about 30 miles and set up at the company's substation at Tamaqua. This afforded car service as soon as the converting apparatus was dried out and repaired. A portable substation obtained from the Monongahela Valley Traction Company filled in for the old-style generators, so that normal rush-hour service was re-established. This was delayed by the addition of grab-handles, end-ladders, 1¼-in. hose and other changes, made to conform with M. C. B. requirements, before it could be accepted for transportation.

The A. I. E. E. Mid-Winter Convention

Electrical Engineers, at New York Meeting, Discuss Among Other Subjects, Generator Heating and Reactance Protection of Electrical Machinery and Circuits

THE fifth mid-winter convention of the American Institute of Electrical Engineers was held in New York City on Feb. 14, 15 and 16, with an attendance of about 500. The papers were largely of a special electro-technical character relating to theory, design and operation of machinery and circuits. The meeting opened with a brief patriotic address by President H. W. Buck, who explained the plan of the engineering societies for co-operating with the war department of the federal government. He stated that the invitation extended by the A. I. E. E. to its membership to enroll with the institute, stating qualifications for military service and circumstances affecting military serviceability had met with a tremendous response. He also explained the plan for an organization to be known as the Engineering Council for United Engineering Societies through which engineers can express themselves as a body on public and engineering matters relating to human affairs.

Among the topics discussed in the papers only two will be mentioned here as of rather considerable interest to the power generation and distribution departments of electric railways. These are the internal temperatures of electric generators, and devices for protecting circuits from excessive overloads. On the first-named topic a paper, prepared by Ralph Kelly, power engineering division Westinghouse Electric & Manufacturing Company, was presented by Prof. Alex. Gray of Cornell University. In this the author outlined a method for calculating the internal temperatures of electric generators. The discussion which followed brought out the difficulties of calculating these temperatures on a rational basis, but emphasized the importance of recognizing the fact that internal temperatures are much higher than external ones. This is, of course, due to the fact that heat can only flow under the influence of "temperature head" or difference of temperature. In flowing from the interior of the machine, when it is generated, to the outside where it is radiated the heat must overcome the resistance due to the imperfect heat conductivity of the materials.

On the subject of circuit and machine protection by means of current-limiting reactors there were two papers, one by J. Allen Johnson, electrical engineer Ontario Power Company, Niagara Falls, Ont., and one by P. B. Juhnke, Commonwealth Edison Company, Chicago, Ill. These and the resulting discussion went to show that while reactance has an excellent protective effect against short-circuits in electric circuits there is a limit to the amount which should be used. Excessive reactance between generators reduces the synchronizing power and thus increases the tendency to hunt. One speaker in the discussion said that in this respect a bus reactor, that is, one connected between sections of a power plant, acts analogously to a mechanical coupling between two generators. If the reactance is too low, comparable with a rigid coupling, the stress imposed on the machines and system during synchronizing may be severe; whereas too high a reactance, comparable with a flexible coupling, may reduce the synchronizing power too much.

Mr. Juhnke told of a short-circuit which occurred near one of the great power plants of his company, causing an automatic disconnection of an 80,000-kw. load. The protective reactors in this case prevented great damage to the equipment and the greater load interruption which must have occurred without them. It was stated that had the reactors not been used mechanical forces up to 1000 lb. per foot might have occurred between parallel conductors.

Society of Terminal Engineers

The Society of Terminal Engineers has just been chartered under the laws of the State of New York with headquarters in New York City for the purpose, among other things, of promoting the study of terminal engineering and mechanical freight handling as a specialty.

The new organization has three grades of membership, viz., members, associate members and juniors. The members grade is open to professors of civil and mechanical engineering, and engineers specializing in terminal work. Associate membership applies to officers and others connected with concerns manufacturing freight handling appliances and terminal equipment, and those whose work and interests enable them to cooperate in the aims of the society. Junior members comprise recent graduates of recognized technical schools who will specialize in terminal engineering, and young engineers qualified to fill subordinate positions in terminal work.

A rate of $6 a year, without initiation fee the first year, has been fixed as dues for membership in the new society. The partial organization so far effected is: President, H. McL. Harding, New York; vice-presidents, Gen. W. H. Bixby, U. S. A., Washington, D. C., and John Meigs, Philadelphia, Pa.; treasurer, W. J. Barney, New York; secretary, J. Leonard, New York. The office of the secretary is at 1133 Broadway, New York. The society will meet once a month in New York.

Practical and Economical Solutions of Problems in

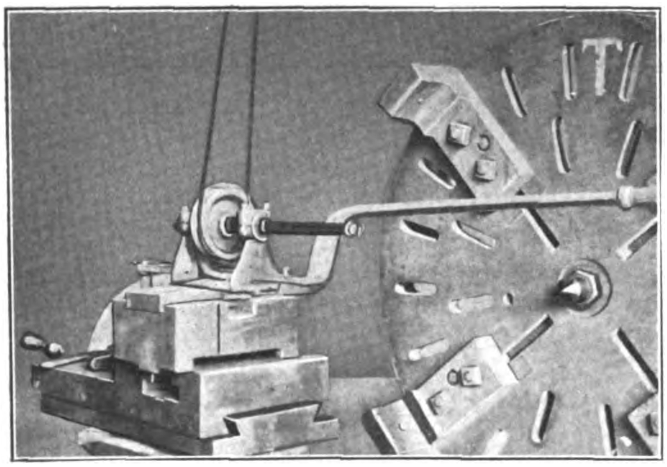
EQUIPMENT AND ITS MAINTENANCE

Pole Raising with Old Emergency Wagon—Twin Cities' New Two-Car Unit—Avoiding "Loose Ends" in Way Department—Maintenance Cost Data in Graphic Form—Good and Bad Bridge Construction

(Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.)

Spindle of Old Wood Lathe Used for Commutator Slotter

The accompanying illustration shows a home-made commutator slotter constructed by M. B. Osborne, master mechanic Galveston (Tex.) Electric Company. The carriage of a large machine lathe holds a heavy iron block, machined to take the spindle of an old wood lathe which was taken from the company's junk pile. The circular saw which cuts the commutator slot is mounted on the end of this spindle. The armature is mounted on the large lathe, and the slotter is moved along commutator by means of the long handle shown in the illustration. The cost of constructing this device in the shop was less than $15.



COMMUTATOR SLOTTER USED IN THE SHOPS OF THE GALVESTON (TEX.) ELECTRIC COMPANY

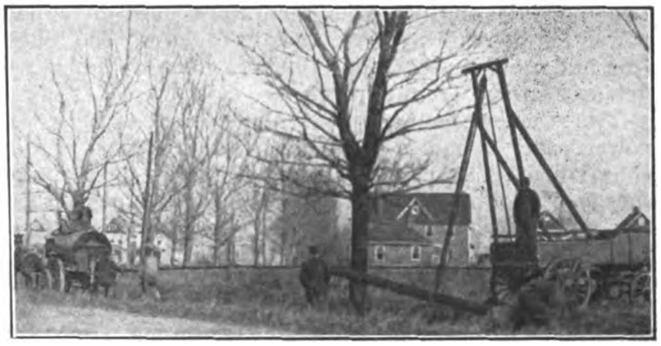
Pole-Raising Equipment Made from Old Emergency Wagon

BY G. H. MCKELWAY

Engineer of Distribution Brooklyn Rapid Transit System

A pole-raising wagon which has been in successful use for several months is shown in the accompanying illustration. It consists of an old emergency wagon with a strong gallows frame securely braced and bolted to the floor. When the pole is to be raised at the back of the wagon the block and tackle is placed in the center of the top crossbar, and when the pole is to be raised on the side the block is attached to the end of this crossbar.

Where conditions will permit, the wagon is backed up to the pole hole with the block and tackle suspended from the center of the top bar. A rope sling is made fast to the pole, and the hook which is attached to the pulley block is slipped under it. From the other end of the block and tackle the rope is run down through a pulley attached to the back end of the wagon and then hitched to a team of horses, which raise the pole by drawing on the rope. In this case the rope was attached to a tank wagon that carried water for use in mixing the concrete in which the poles were set.

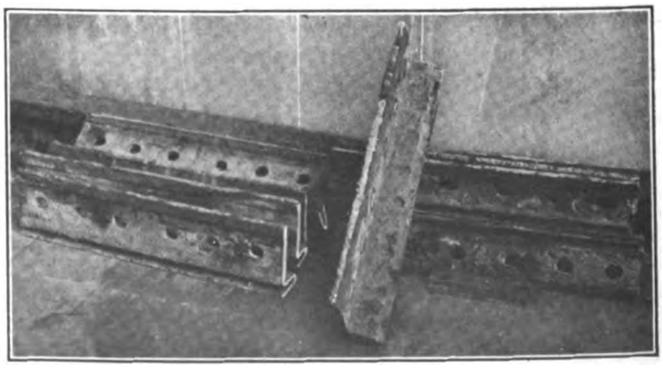


RAISING POLES BY MEANS OF GALLOWS ATTACHED TO OLD EMERGENCY WAGON

On some pole-raising wagons the legs of the gallows frame are extended to the ground, but in this case the wagon was amply strong for any size of pole that it might have to raise. When first used, a few bags of cement were placed in the wagon to prevent it from tipping over when the pole was raised at the side. This made the wagon very heavy, and so the load was gradually decreased until it was found unnecessary to carry any ballast at all. Occasionally, however, the wagon has tipped slightly, but this has been stopped by having someone step on the hub of the opposite wheel.

Old Angle Bars Reclaimed by Electric Welding

One of the economies practised by the Puget Sound Traction, Light & Power Company, Seattle, Wash., is the reclaiming of old angle bars by the use of an electric welder. The accompanying photograph shows a



WORN ANGLE BARS BEFORE BEING RECLAIMED BY ELECTRIC WELDING number of these which have been removed from the track when relaying rail or making other improvements. The angle-bars shown have been worn so badly that they are no longer of use.

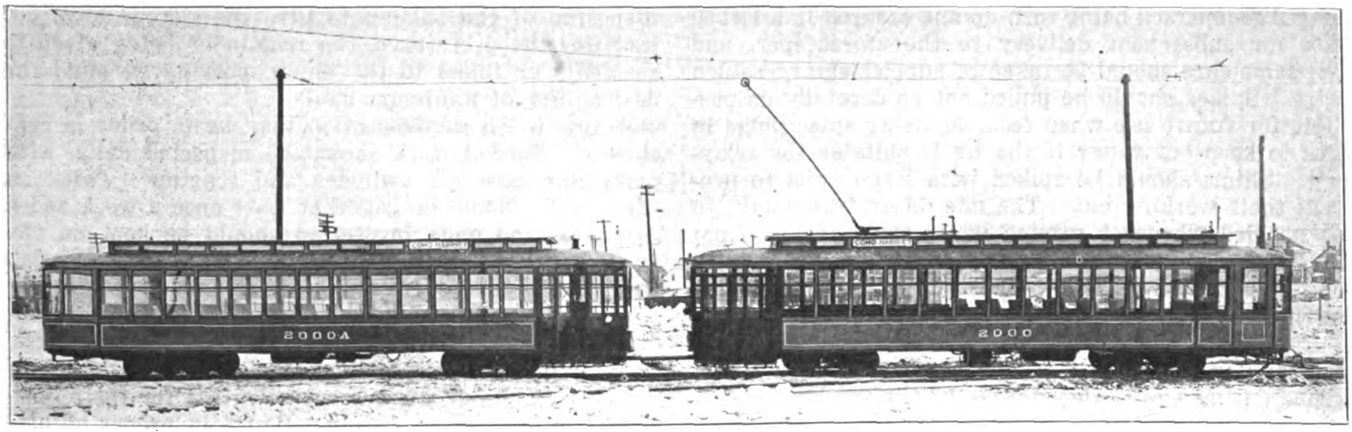
In order to reclaim these bars, sufficient additional metal is welded onto the top of the bar with the welder. Usually two layers are built up to make sure that there is plenty of metal, not only at the worn places but also between them. The bar is then planed down to size. It takes about ten minutes for the welding operation and about the same length of time to run the bar through the planer. A saving of from $1 to $1.50 per bar over the cost of replacing with new bars is effected by this scheme.

New Type of Car for Twin Cities

Equipment Which Is Being Tried for Rush-Hour Service Has 26-In. Wheels, Inside Journals, a Low Floor and a Weight of 14 Tons

The Twin City Rapid Transit Company is experimenting with a two-car unit for rush-hour service that is made up of cars of a new type designed by W. J. Smith, master mechanic, and built in the company's shops.

Each of the new cars in the unit is equipped with four GE-258, 25-hp. motors, and 26-in. Davis wheels. The trucks are very light, with arch-bar side frames and a 4 ft. 8 in. wheelbase, and the journals have been placed between the wheels, thus reducing the length of transom and bolster necessary with the customary arrangement of having the side frames outside of the wheels. The brakes are of a specially designed band type.



UNIT OF TWO LOW-FLOOR CARS BEING TRIED OUT ON TWIN CITY LINES

The level of the car floor is 31 in. above the rail. The car body is 46 ft. long by 9 ft. wide, and in outward appearance is similar to the Twin City Lines standard, except that it is not so high. For the vestibules there have been provided folding doors with wireglass panels in their upper part. These doors are operated by the same type of mechanism that is used for the company's standard folding wire, platform gates. However, the doors will be operated by the conductor instead of by the motorman, as is the rule on the present type of cars.

A different body arrangement has been adopted for the two cars making up the unit, the front car having rear entrance and exit and the rear car front entrance and exit. The front car seats forty-seven passengers, and rear car fifty-four. Both cars are permanently coupled together, and the rear car is not equipped with control, all eight motors being operated by one controller on the front car. A hollow steel coupling carries the power line, air hose, bell wires, etc.

The total weight of the unit of two cars, fully equipped for operation is 55,500 lb., this including double sash for both cars. The present standard Twin City car weighs complete 42,000 lb. when equipped with four GE-200, 40-hp. motors. For comparison, two such cars in a train would weigh 84,000 lb. and would seat ninety-six passengers, while the new unit weighing 55,500 lb. seats 101 passengers. One of the new trucks, complete with motors, wheels and brake equipment, weights 5200 lb.

The company expects to adopt the type of car used in the front of this unit as its new standard. If operation proves successful, more double units will be built for use in the rush hour.

Efficiency in Maintenance of Way

Careful Planning and Attention to Detail Are Especially Necessary to Success in This Department

BY DAVID CURTIN

Engineer Maintenance of Way, Bay State Street Railway

Close attention to details is the price of efficiency in all branches of electric railway operation. In the maintenance of way department of any large system, the cost of even small departures from good practice on a local job may lead to serious increases in operating expenses, and unless apparently trifling matters are properly handled the chances of performing work economically are jeopardized. Oversights multiplied over many divisions or work done without thoroughness affect the service and the company's cost sheets far beyond the appreciation of outsiders. There is therefore every incentive to standardize methods in handling routine matters, thereby leaving more time for the consideration of new and important problems.

Experience develops the best ways of handling work, and some of the lessons taught by the past dozen years in the maintenance of way department of this company may be suggestive to others in the same field. I do not mean to imply that our practice has become rigidly standardized, for it is constantly changing as new problems and conditions arise. Instead, I have been persuaded that if I emphasize some of the points which, if neglected, might be classed as "loose ends," the interests of more thorough work will be served.

Whenever matters are taken up with municipal officials by a representative of the way department, the local operating superintendent should be consulted and kept in touch with proceedings, as he is the company's authorized representative in dealing with city or town officials. Lack of co-operation between the departments may lead to delays in carrying out work or to adverse effects on the service, and economical operation depends upon full team-play. Ample notification should be given to the line department of any plan to break track, so that a temporary return can be installed around the break if necessary. The provision of material for contemplated new jobs is facilitated by having the representative of the way department walk over the work as soon as he is notified that it is to be done and decide as to the economical location of supplies, taking into consideration the location at which track is to be broken and how the work will affect the handling of ties, gravel, etc. It is unwise to distribute more material than will keep the work moving to best advantage.

No time should be lost in reporting to the headquarters of the way department as soon as a member of the staff learns of any street improvements or changes that are to be made. In this class are excavations on account of sewer, water, gas, electric light or telephone connections that are being installed under or near the track, or any work being done by outside parties on bridges, state highways, etc. The progress of such work should be reported to headquarters daily. This may help the way department employee to be prepared with the necessary material, grade papers, etc., and prevent delays in the operation of cars and the progress of trackwork.

Plows and scrapers should be used for all possible excavation work, the men following up and doing all necessary trimming. When possible on a double-track location, with one track being rebuilt at a time, plowing should be done by car. Scrap bonds should be removed from track being torn up and secured in a locked box for subsequent delivery to the storekeeper, and the same care should be taken of supplementary return wire. Spikes should be pulled out as carefully as possible for future use when feasible, using spike plugs in ties to keep out water if the tie is suitable for relaying. Shims should be spiked with large nails to prevent their working out. The line department ought to be notified whenever ground wires are detached from the track during the progress of the work, or found to be broken from the track, before connections are made to the rail.

Bonds improperly applied are most valuable to the company in the junk pile, and as long as such bonds remain in the rails they represent this money equivalent. Installing bonds in damp weather is bad practice. In bonding, drills should be kept sharp and up to gage. When high-speed drills become worn on the flute so that they drill undersized holes, their proper destination is the storeroom. It is a great mistake to install bonds in poorly drilled holes, and careful bonding requires that holes in rail should not be left exposed to rust for any length of time, but should be filled with grease and left until ready to apply the bond terminal. Careful handling of bonds pays, as they become shapeless if not kept snugly in their containers.

The tamping of ties is one of the most important details of modern track construction. The life of track can be greatly cut down by insufficient tamping, especially at the joints. Time is sometimes wasted by continuing to tamp after no further improvement is possible and also in tamping against the sides of ties instead of underneath. Tamping after improvement ceases is liable to raise the track out of surface. Men should tamp in pairs, using bars of the same size and weight, standing on opposite sides of the tie and striking together, for even tamping. Joints should be "coaxed" by tapping on the bottom of the plate and not driven with the sledge, as there is danger of breaking the rail. After joints have been tightened, it is essential to keep them uncovered until after two days of car service, after which the track can be gone over and any remaining slack taken up, using care not to bend the plates. Every joint hole in special work should be bolted, as the life of special work depends on this to a great extent. Whenever special work is received, immediate inspection of it is desirable. It is a mistake to sign for special work as "received in good order" before being satisfied that such is the case. Temporary efforts to save time and trouble along this line may result in considerable inconvenience and multiplied correspondence before matters can be straightened out. An inspection of defective special work by a division roadmaster is expedient before it is sent back to the manufacturer.

Maintenance-of-way employees on a well-managed property are expected to render all possible aid in case of accident; to send in full reports of such occurrences; and to secure the names and addresses of witnesses if the accident appears due in any way to track or roadbed conditions. Ends of rails should be protected by red lanterns when piled or being turned at night and it is most important to safeguard excavations made by outside parties in or near tracks or company property, regardless of the neglect of the lighting by the responsible party. Such lighting should be independent of the regular street-lighting service. Liberality in the use of lanterns pays, as an accident-prevention measure. The disposal of waste material which might otherwise cumber the roadbed or street is important, and this should be done as economically as possible, first considering what the company can use. It is a good plan in disposing of the balance to give the city or town authorities the preference, the remainder being given to residents or taken to the dump, bearing in mind the desirability of minimum haul.

A few words on inspection may be in order in conclusion. Special work should be inspected daily, with particular care for switches and tongues. Track on "fast rail" should be gaged at least once a week and a record of the gage inspection should be kept on file. Immediate removal of erroneous gages is essential. Branch-offs, crossovers and turnout ends that are only used occasionally ought to be maintained in clean condition in case emergency operation requires their use, thereby preventing possible derailments or delays in cleaning them out when occasion arises for their service. The keeping of switch tongues in proper adjustment is a prime factor in the prevention of derailments. High or low manholes, broken manhole covers, irregular paving, if liable to injure car equipment, cause derailment or accident to vehicles should be reported immediately to headquarters. A daily inspection of railroad crossings by oilers with immediate report of any improper conditions is most important. The track for a distance of at least 150 ft. on each side of a railroad crossing as well as the crossing itself should be maintained in the best of repair at all times, as should curves on steep grades or at the foot of grades. Special care should be taken to keep stones out of the flanges of crossings and to spike down or renew loose planks when necessary. Another important daily task is the inspection of track on bridges and in trestles, with special attention to loose bolts and spikes, wide gage, loose or defective planks. Immediate repairs should naturally follow such conditions when discovered.

In many cities the posts on which the fire alarm boxes are located are painted red to make them more conspicuous. For the same reason it is the practice in some railway shops to paint an 8-in. red strip from each fire extinguisher to the ceiling.

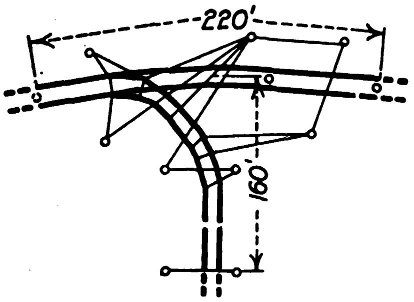
Cost of Erecting Overhead Work—IV

(From the records of a large Eastern company)

The following is the fourth group of a series of diagrams with cost figures to show actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. The preceding groups appeared in the issues for Jan. 20, Jan. 27, and Feb. 10.

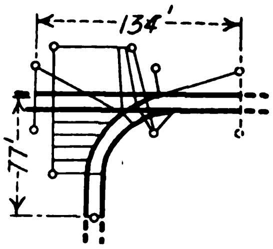
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Double track, right-hand branchoff from curved main line, angle 60 deg.



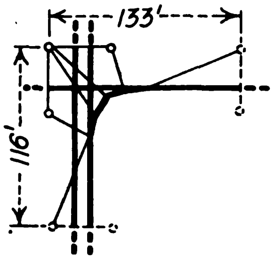
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
26*	$36.30	$26.40	$45.38	$33.00	$54.45	$39.60

Double track, left-hand branchoff, angle 90 deg.



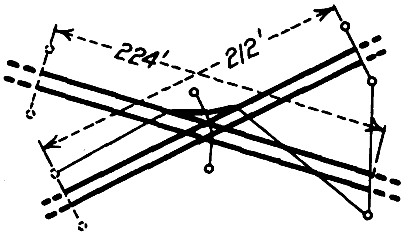
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
27*	$29.04	$21.12	$36.30	$26.40	$43.56	$31.68

Single track crossing double track, with single track connecting curve, angle 90 deg.



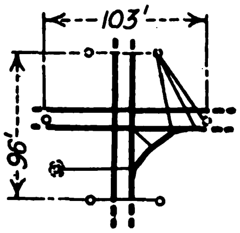
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
28*	$29.04	$21.12	$34.39	$25.08	$43.56	$31.68

Double track crossing double track, with single track connecting curve, angle 45 deg.



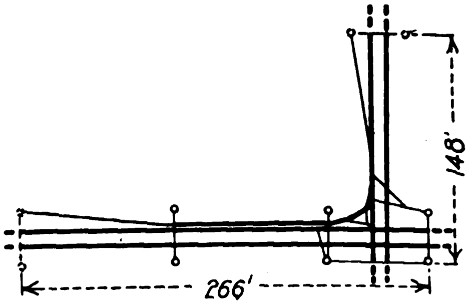
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
29*	$36.30	$26.40	$45.38	$33.00	$54.45	$39.60

Double track crossing double track, with single track connecting curve, angle 90 deg.



	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
30*	$32.67	$23.76	$39.93	$29.04	$17.19	$34.32

Double track crossing double track, with single track connecting curve, with unbroken main line connection, angle 90 deg.



	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
31*	$27.23	$19.80	$32.67	$23.76	$43.56	$31.68

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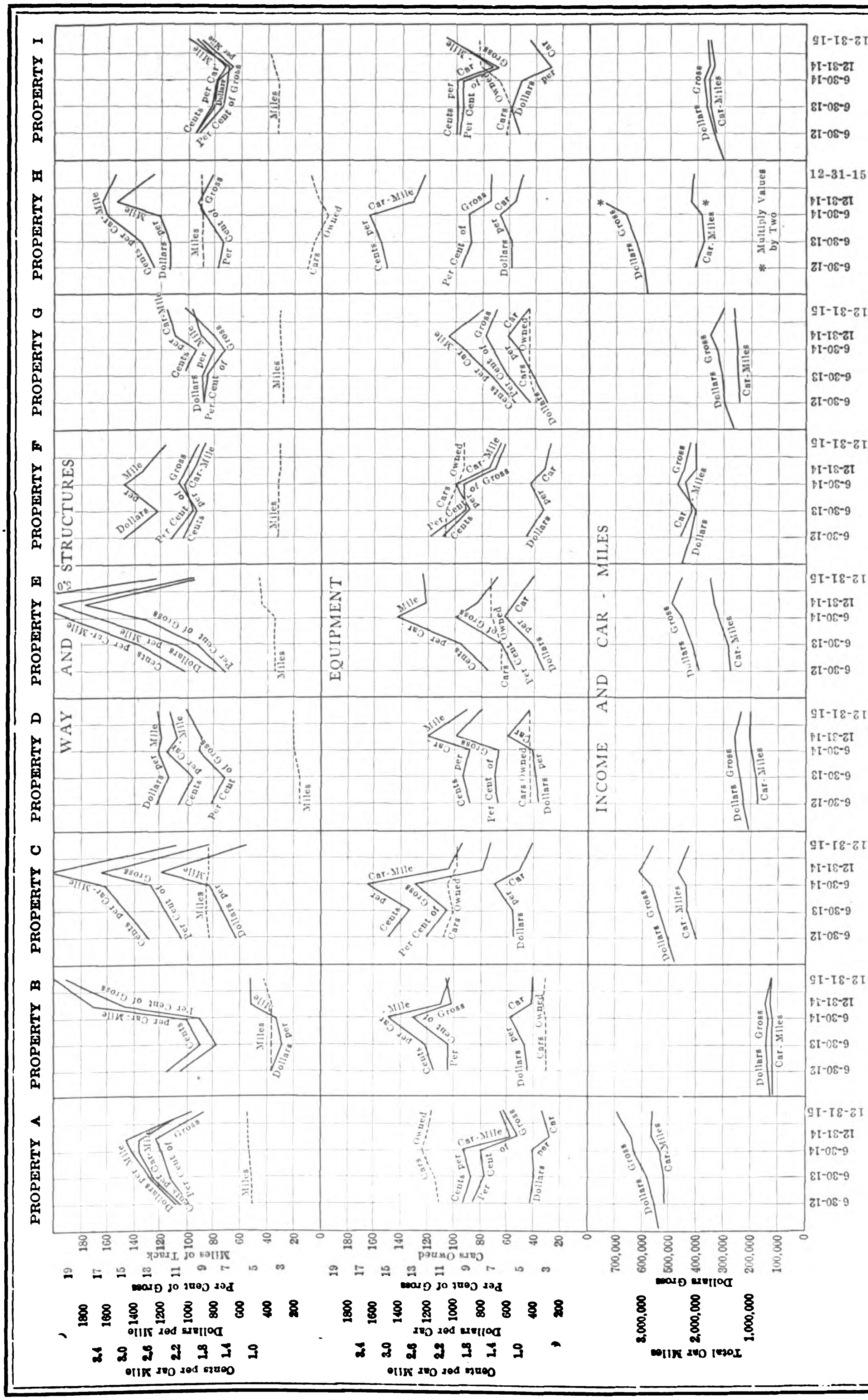
*Trucking includes cost of extra reel truck. None of the figures on this page includes cost of superintendence and engineering.



Maintenance Costs on a Number of Electric Railway Properties of Moderate Size

Note:—Values of "Dollars per Mile," "Dollars per Car," "Dollars Gross" and "Total Car-Miles" for six months ending Dec. 31, 1914, are doubled to compare with annual figures.

Some Maintenance Cost Data in Graphical Form

Through the courtesy of a company operating a number of railway properties in cities of moderate size, it has been possible to give to the readers of the ELECTRIC RAILWAY JOURNAL the data plotted in the graphs appearing on the page opposite. These bring the record up to the end of 1915. The 1916 data are not included as they cannot be considered typical in view of the prevailing high prices of materials and scarcity of labor.

It will be noted that the cost data are stated in several ways, giving an opportunity for comparison based on income, car-miles operated and miles of track for the way and structures, and on income, car-miles operated, and cars operated for the equipment.

Inspection and Maintenance of Railway Bridges*

Importance of Thorough Inspection, Dangerous Conditions Often Overlooked, Purpose of Guard Rails and Timbers, Use and Abuse of Paint, and Safe Loading Specifications

BY H. C. KEITH
Consulting Engineer, New York City

In the State of New York the board of railroad commissioners was established in 1883, and the failure of three railroad bridges within a year after the commission was organized brought forcibly to its attention the need of investigation of all the bridges in their jurisdiction. Accordingly an order was issued to the railroad companies to file complete plans with strain sheets of all bridges on their lines.

Of about 2500 railroad truss bridges then existing in the State, many were reported to "have been repaired or rebuilt before the strain sheets were submitted to the board" because of conditions found which had previously been unknown or winked at, and 669 truss bridges were repaired or rebuilt because of criticism by the board. As may be judged by these results, this investigation had a very important effect on the safety of the bridges in this State. With regard to the frequency of bridge inspection it may be said that two years is a satisfactory interval between inspections, though in certain individual cases greater frequency is desirable.

Much has been said of the danger of electrolysis and short-circuiting on bridges used by electric railways, and it is a real danger, though serious cases are rare. However, if the steel is found to be charged with electricity the inspector should make thorough examination to learn the cause of the leak and to discover any damage done where the current enters or leaves the steel work.

Timber piles and posts in sea water should be examined between high-water level and a little below low-water level for damage done by teredo or limnoria. In waters infested by either of these pests timbers should be given as great protection as possible, since a pile may otherwise become unsafe in less than two years. Thoroughly impregnating with creosote is somewhat effective as a decided deterrent, though not a sure preventive. If any method of incasing the piles is used the casing should be carried at least 5 ft. below low-water level and somewhat above high-water level. The best protection where practicable is a fill of earth or concrete to somewhat above high-water level, facing with rip-rap if necessary to prevent scour. When the pests are found the extent of their ravages should be thoroughly investigated and recorded. On land white and black ants are sometimes as destructive as the teredo and limnoria are in sea water, but the chief cause of danger to timber on land is rot which is caused by dampness usually aided by warmth.

PAINTING AND PRESERVATIVE COMPOUNDS

Creosoting, kyanizing, vulcanizing, etc., are deterrents rather than absolute preventives of decay. They all act by stopping up the pores of the wood and thus keeping out the moisture. Creosoting is the most effective of these processes, though for soft woods, as spruce and white pine, kyanizing and vulcanizing are of great value. Hard pine that is full of pitch may resist decay as well as if creosoted, but for protection from teredo and limnoria the poison of the creosote adds to the efficiency. Unfortunately, most of the hard pine now in the market has been cut from trees which have been tapped for turpentine, so that the pores are not filled with pitch.

Sometimes a specially careful but unreasoning bridge man paints ties, expecting thus to make them more durable. The result is usually just the opposite; track men and the public soon wear off the paint from the top of the ties allowing moisture to enter there, while the paint on sides and bottom delays the drying; hence the conditions are right for rapid decay. It is of some value to paint the ends (though tar or pitch is better than paint) and it may do some good to paint the top, but the bottom and sides should be left unpainted. The purpose of painting steel work is to protect it from rusting by excluding moisture from contact with the metal. The best of paint cannot be thoroughly effective if dirt is allowed to collect on the steel work, since the dirt holds the moisture which will eventually find its way through the paint and do its destructive work with ever-increasing speed until attended to. A layer of tar or bituminous mixture has been used effectively to protect the steel in some places. When paint is put on over a rust flake the new paint skin is soon broken and worse than useless, since the moisture can get under it and has no chance to dry out. It is of prime importance that the steel be thoroughly cleaned before the paint is applied.

GUARD TIMBERS AND RAILS

The purposes of guard timbers and guard rails should be kept clearly in mind in order that their efficiency for those purposes may be observed. The primary object of guard timbers is to maintain the spacing of the ties to prevent bunching, and the secondary object is to stiffen the floor and make the ties work together. The purpose of the guard rails is to prevent the straying of a derailed truck and to bring back near the proper position a truck that may have been derailed on the approach to the bridge. Inside guard rails are a very important adjunct to a bridge carrying a track. They should be fully spliced or their efficiency will be greatly reduced. Care should be taken that bolts are so placed that neither heads nor nuts can be sheared off by a derailed car. Some engineers do not realize that outside guard timbers do not answer the same purpose. If a wheel is retarded by rubbing against the inside rail it will tend to turn the axle a little, directing the car toward its normal location; but the retarding of a wheel by rubbing on the outside guard timber will swing it further out of line and away from its proper place. This change of direction, too, will throw it against the guard more nearly at right angles, thus making it more likely to climb the guard and leap into whatever disaster is lurking beyond.

Though the outside guard timbers are not qualified for guiding a derailed car, they do have a very important office. Without them, or some substitute, the ties would be likely to become bunched; the guard timbers also help to distribute the load and reduce the danger that the ties will tip up under a derailed wheel when stringers are too closely spaced. Guard timbers should always be bolted to at least every fourth tie.

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*Abstract of part of a paper on "Bridge Inspection and Reports," presented before the Brooklyn Engineers' Club on Feb. 8, 1917.

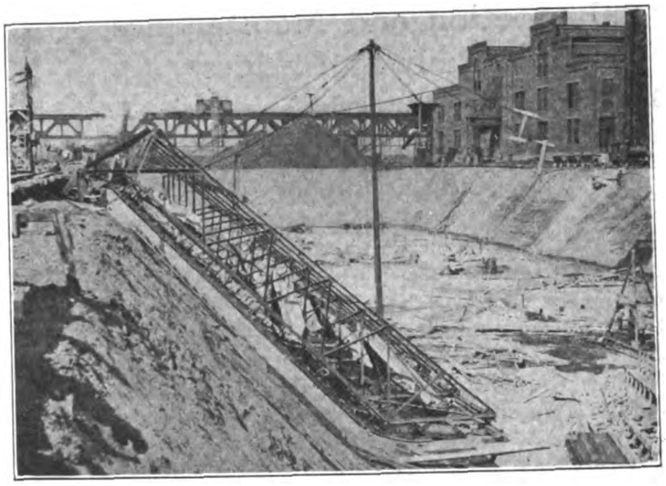
Any type of construction which makes no provision for the safety of a derailed car is very undesirable. One such construction which seems to be popular is a flitched beam with the rail spiked directly to the timber stringer which is bolted between two I-beams or channels, with no floor between the stringers at all adequate to support a car if it leaves the rail. Another similar construction is a double stringer of I-beams or channels with spiking pieces between, which rest on horizontal separators of short pieces of channel riveted to the beams. Fortunately, many bridges with such stringers have heavy plank floors laid on top of the stringers, thus providing for the safe passage of a derailed car if it does not get too far away from the track stringers. A danger in many highway bridges is that a car may leave the rails and the support provided for it and get on to that part of the bridge where the stringers were designed for lighter loads; perhaps also nearer the center of floor beams competent to carry a car only near one end.

The specifications of the Public Service Commission of Massachusetts for bridges carrying electric railways have been found so satisfactory for the purpose that they have been used with certain modifications in connection with a great many bridges in other states. For the track load these specifications use a 50-ton car with wheel spacing of 5, 15 and 5 ft. and a total length of 40 ft. over all. For roadway and sidewalks loads of 100 lb. per square foot are used for city bridges and 80 lb. per square foot for country bridges 100 ft. or less in length. These uniform loads are assumed to cover the full area of the roadway and sidewalks except a width of 9 ft. at each track. For longer spans these uniform loads are reduced 1 lb. per square foot for every 5 ft. additional length up to 200 ft., and for all greater lengths 80 lb. and 60 lb. per square foot respectively are used. For suburban bridges the floor is designed for the same loads as the city bridges, while trusses and girders are designed as for country loads. For highway bridges in city, town or country the specifications require provision for an alternative roadway load of a single 20-ton autotruck on two axles 12 ft. on centers and wheels at 6-ft. gage; the weight assumed to be distributed 6 tons on one axle and 14 tons on the other; the truck assumed to occupy a floor space 32 ft. long and 10 ft. wide, the overhang being equal at front and back and at the sides. With track and uniform roadway and sidewalk loads, impact of 25 per cent is added for floor beams and stringers, while for girders and members of main trusses the impact used varies from 25 per cent to 10 per cent, according to the loaded length producing maximum live-load stresses, except that 40 per cent is used for counters and floor-beam hangers. With the autotruck load 50 per cent impact is used for steel members which receive their full load from one panel point only, and no impact is used for wood floor or stringers. The tension stress allowed by these specifications is 16,000 lb. per square inch of structural steel. Other allowed unit stresses in general correspond with those given in other specifications using the same tensile stress, except that in direct compression these specifications allow only 12,000 lb. per square inch of steel, reduced by the Gordon formula.

Diagrams have been prepared by which may readily be obtained the approximate weights of other single-truck or double-truck cars symmetrically loaded which would give the same moment or shear as the standard 50-ton car of the specifications. By use of these diagrams a quick determination can be made as to whether it is permissible to run any car whose wheel spacing and loads are known over a bridge whose capacity for cars of the standard wheelbase is known.

Coal-Storage Reservoir Constructed After Disastrous Fire

About a year ago a disastrous fire destroyed hundreds of tons of coal at the Brunot's Island generating station of the Duquesne Light Company, Pittsburgh, Pa. Since spontaneous combustion is liable to occur when coal is piled to a greater depth than 15 ft. or 20 ft., a concrete basin is under construction in which 100,000 tons of coal can be protected against fire by being submerged in water. The basin will be 25½ ft. deep, 791 ft. long and 153 ft. wide, made of 40 x 50-ft. reinforced concrete slabs, laid so as to permit expansion and contraction. The expansion joints are made waterproof with pitch and tar paper and the abutting ends are supported by concrete 12 in. thick and 4 ft. wide. The inside walls have a 45 deg. slope.



COAL-STORAGE PIT DURING CONSTRUCTION

The coal is handled by cranes, and the water for submerging the coal is pumped into the basin through a 14-in. cast-iron pipe leading from the power house to four 12-in. cast-iron outlet pipes placed 160 ft. apart and 6 ft. below the top of the reservoir. The discharge system consists of four 18-in. pipe lines.

Poles Set at Small Cost

The Georgia Railway & Power Company, Atlanta, Ga., has set a considerable number of poles in north Georgia during the past few years, and by using a block-and-tackle method of its own design has been able to set a large number of 50-ft. creosoted poles in a day's time with a minimum number of men and at a cost of 60 cents to 75 cents per pole. In giving this figure E. B. Hook, the superintendent of construction, states that it does not include anything but actually setting and tamping-in the poles. The block-and-tackle method referred to has been used for a couple of years, a pair of mules and nine or ten men being required to set the poles. Recently a 1½-ton truck has been substituted for the mules and the services of six or seven men dispensed with. In this way from twenty-five to forty 50-ft. and 60-ft. creosoted poles, weighing approximately 2 tons each, are being set in a day with three men and the truck at a cost of about 33 cents per pole.

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News of Electric Railways

Traffic and Transportation
Financial and Corporate Personal Mention Construction News

Connecticut Commission Reports

A Summary Is Also Presented of the Recommendations of the Commission with Respect to New Legislation

The Public Utilities Commission of Connecticut has transmitted its fifth annual report to the Governor covering the year ended June 30, 1916. The report contains a general review of the work of the year together with certain recommendations and suggestions and detailed summaries and analyses of the financial condition of the several classes of companies under its jurisdiction. With respect to the electric railways the commission says in part:

"Passenger service on electric street railways, especially in the large cities, has been inadequate to the reasonable needs of the public. The rapid and almost phenomenal growth of some of the industrial centers created a demand for additional trolley service which the companies were unable to meet, and as a consequence, overcrowded conditions on electric railway cars during rush hours became the rule rather than the exception.

"During the year ended June 30, 1916, the Connecticut Company put into service ninety-two new double truck cars, adapted for summer and winter use. At a conference with the officers of this company in the spring of 1916, the commission recommended the immediate placement of an order for 300 additional cars, to be ready for service during the coming winter. Subsequently, on application of the Connecticut Company, the commission approved the type of construction of 100 additional double truck cars, for which an order was placed, and which were to be ready for service by Nov. 1, but present indications are that actual deliveries will be very much later. The 100 additional cars will not be sufficient to remedy the overcrowded conditions, particularly during rush hours, but should afford material relief.

"Service of the Shore Line Electric Railway on lines of said company supplied with electrical energy from its power plant at Saybrook, has been very unsatisfactory, and for the past six months has been partially suspended. In July, 1916, by virtue of an agreement with the Shore Line Electric Railway, The J. G. White Management Corporation, New York, assumed charge of the rehabilitation of the Saybrook plant, with instructions and full authority to put the same in good serviceable condition. The work has necessarily been slow, but substantial relief has already been secured.

"The Shore Line Electric Railway and the Norwich & Westerly Traction Company have adopted the so-called 'copper zone' as a basis for passenger fares in substitution for the ordinary 5-cent zone system formerly used. This system was made effective on the Saybrook and East Lyme Division on Sept. 1, 1915, on the Norwich & Westerly Traction Company, including the Groton & Stonington Street Railway, on Nov. 22, 1915, and on the New London Division of the Shore Line Electric Railway on Feb. 24, 1916. Patrons of the Groton & Stonington Street Railway petitioned the commission in December, 1915, alleging unreasonable increases in rates incidental to the change to this new plan and the towns of Stonington and Groton also intervened as petitioners in the case. After numerous hearings and inspection of the system the commission issued a finding requiring some adjustment of zones, but the general plan and rates were not otherwise disapproved. From this order of the commission an appeal was taken to the Superior Court which is still pending.

"The total mileage of single track operated by street railways in Connecticut is 830.479 miles. These companies operate outside of the State 341.91 miles, making a total single track mileage operated of 1172.38. The aggregate salaries and wages paid to employees of street railway companies in Connecticut for the year amounted to $4,339,801."

RECOMMENDATIONS FOR LEGISLATION

Among the recommendations of the commission are the following:

A law directing the commission to prescribe uniform systems of accounts for the several classes of reporting utilities, consideration to be given to the systems prescribed by the Interstate Commerce Commission for companies reporting to that commission.

A law whereby the commission may require companies to make returns for the calendar year instead of for the year ended June 30, as at present, such change in reporting year to be made if and when the Interstate Commerce Commission shall, as is now contemplated, require companies reporting to said commission to report for the calendar year.

That Sec. 1 of Chap. 128 of the Public Acts of 1911, be amended by removing the exception of municipal utilities from the operation of the Public Utilities Commission Act, to the extent of giving the commission jurisdiction over municipally owned utilities operating outside the corporate limits of the municipality.

A law requiring the installation of standard advance signs on line of highway, approximately 300 ft. from railroad tracks, at grade crossings, and providing for the maintenance thereof, substantially in accordance with resolutions which were adopted by the National Association of Railway Commissioners, at a meeting in Washington in November, 1916.

In view of the legislation enacted by the 1915 session of the General Assembly, giving the commission jurisdiction over the issuance of securities by the New York, New Haven & Hartford Railroad, the largest public service corporation in the State, the commission suggests the advisability of considering whether or not such authority should be extended over all the utility companies.

Mr. Sanders Optimistic

Street Railway Commissioner of Cleveland Hopes to Continue Three-Cent Fares

Fielder Sanders, street railway commissioner of Cleveland, Ohio, announced on Feb. 16 that the recommendations he will make to Council for the purpose of maintaining low fare are: Retirement of useless officials; gradual payment of the street railway deficit of $450,000, instead of payment in a lump sum; retirement of old cars and purchase of new equipment that will reduce the operating expenses; a safety-first campaign to educate the employees and the public in ways to reduce accidents and consequent damage claims.

On May 1 the trainmen in the employ of the Cleveland Railway Company are to receive an increase of 1 cent an hour in their wages. This will amount to about $200,000 a year. Mr. Sanders said that the operating allowance may have to be increased from 13½ cents a car-mile to slightly more than 14 cents, but that after July the company will purchase additional power from the Cleveland Illuminating Company. Mr. Sanders believes that the saving with purchased power will offset the increase in expenses and make it unnecessary to raise the fare.

The company has indicated its desire for payment in full of the deficit in the operating and maintenance accounts, which Commissioner Sanders proposes to extinguish in monthly installments.

Toledo Situation Reviewed

Sixty-five Weeks of Negotiation Without Results—Direct Deal with Mr. Doherty Suggested

In an editorial in its issue of Feb. 14 the Toledo *Times* dealt with the street railway commission appointed by Mayor Milroy to perfect a settlement of the franchise question with the Toledo Railways & Light Company. The *Times* believes that nothing substantial will ever come from the so-called "community of interest" plan, and that municipal ownership is a hope rather than a prospect. Something of a substantial nature is what the people want, says the *Times*, and it suggests that Henry L. Doherty is willing to play fair, if allowed to propose a settlement upon a proper basis. The editorial follows in part:

"Has it occurred to Mayor Milroy that his street car commission is not a success, that it is not carrying out his wishes? Sixty-five weeks have elapsed since the commission went into action. During those sixty-five weeks the commission has held many sessions. Out of these discussions has been evolved 'the community of interest' plant, a nebulous proposal that is as impractical from the viewpoint of the public interest as anything that could be devised.

"All four members of the subcommittee are supposed to be for municipal ownership. Both Cochran and Thurston urged the people at first that nothing less than a 3-cent fare should suffice, and that the people could own their own street railroad. Mr. Usher is apparently interested in getting the best possible terms for the people, and Mr. Wright's attitude might be described as nondescript.

"There is no talk of 3-cent fare in the commission now, and municipal ownership has diminished to little more than an echo. The commissioners indeed are discussing 5-cent fares quite generally, and as for municipal ownership, it has been discovered that the people of Toledo are not properly educated for it. During the period of instruction the people are to pay 5-cent fares and enjoy the kind of service provided by men who do not know anything more about running a street railroad than a pig knows about gardening.

"If what the commission has done so far is a sample of what it proposes to do, the people prefer to deal directly with Mr. Doherty. They want action of a positive kind, action that will give them either better service for the prevailing fares or present service at lower fares, although the *Times* is confident they would vote for better service. If Mr. Doherty can submit a plan that is fair, there is every reason for thinking that the people will accept it. Surely it is neither just to the commissioners nor to the people of Toledo that they be kept longer in service."

Six Months for Stealing Fares

Atlantic City Conductor Sentenced—Bridgeport Conductor Apprehended

Judge C. C. Shinn in the County Court House at May's Landing, N. J., on Feb. 14, sentenced Thomas Barlow to six months in the county jail. Barlow was employed as a conductor on the Atlantic Avenue line of the Atlantic City & Shore Railroad last summer, working just twenty-three days when discovery was made that he was collecting and retaining fares.

On Feb. 14 the police of Bridgeport, Conn., arrested W. J. Windsor of Delaware, said to be the leader of a gang that has been swindling electric railways in the East. He waived his extradition rights, saying he was willing to go back to Atlantic City, where he is wanted. According to the information of the detective bureau at Bridgeport the gang started work in Wilmington, by making application for work as conductors. Members of the gang would give references and on writing to these the men would be highly recommended. When they got work they would start in robbing the company. They are believed to have worked in twelve cities under as many names and are said to be wanted with a number of others. Windsor went to work for the Connecticut Company in Bridgeport as a conductor about a month ago. When arrested he had charge of a car on the East Main Street line.

$1,000,000 Power Plant for Columbus

Plans have been completed by the Columbus Railway, Power & Light Company, Columbus, Ohio, for the construction of a power house on the Hocking Valley Railroad, 6 miles south of the city, to cost about $1,000,000.

It has been decided to concentrate power production in the proposed plant, and abandon the Spring Street and the Third Street stations. The company will also give up the plan of building on the bank of the Scioto River, just north of West Broad Street. The property there will be put to some other use.

It is stated that the company has already placed orders for a portion of the equipment of the proposed power house and that the right-of-way has been secured for the high-tension transmission lines into the city.

The company will ask the Public Utilities Commission for authority to issue $1,640,379 of securities. A portion of the proceeds will be used to construct and equip the power house and the remainder for the purchase of additional cars and other equipment necessary. In addition, the company desires to issue securities for funding about $500,000 spent in making improvements last year.

Further Reprisals Against I. T. S.

A resolution has been introduced in the Board of Aldermen of St. Louis, Mo., directing the law department to take steps to collect the mill-per-passenger tax from the Illinois Traction Company since it began operations in 1909.

Officials of the company were notified recently by city officials that the tracks of the line in Venice would be torn up on Feb. 22 unless the company agreed to reduce its fare from Venice to St. Louis from 10 cents to 5 cents. This is the second ultimatum regarding the removal of the tracks which has been sent to the company by the Venice officials. A month ago the city wanted to remove the tracks and the railway officials asked for more time in which to confer with the city officials in hope of reaching an agreement.

Progress on East Bay Franchises

The Legislature of California has approved by concurrent resolution the charter amendments to the charters of Oakland and Berkeley, and has approved the new charter for Alameda, all without amendment or alteration.

These charter amendments enable the Common Councils of these cities to enter upon negotiations for the resettlement of the franchises of the public utilities operating within their limits, and more particularly for the resettlement of the franchises of the San Francisco-Oakland Terminal Railways, Oakland, Cal. All of these amendments have received the approval of the citizens and are now effective.

The next step is the application required to be made by the railway to the Councils requesting that these negotiations be entered upon. When such applications are made it will become the duty of the respective mayors of these cities to appoint committees of seven citizens selected with the power and for the purpose of passing upon and considering the character of resettlement franchise which shall be granted in each instance. When such committees of citizens have determined upon the conditions and circumstances under which resettlement franchises shall be granted, they report their conclusions to the Common Councils, and the Councils are then empowered themselves to consider and pass upon such report and to continue in the negotiations with the railway. After these negotiations have resulted in an agreement, ordinances embodying the terms of the resettlement franchises are to be adopted by majority vote of the Councils, and thereupon such ordinances are to be submitted to the vote of the people. If a majority of the citizens voting thereon approve the same, they become effective and constitute a new contract between the communities and the railway under which they will be authorized to operate for an indefinite period.

Applications for resettlement are being prepared on behalf of the railway and will be shortly submitted to the Councils of the cities in which the company operates for the purpose of commencing these negotiations.

Chicago Considers Fifty-Year Grant

At the meeting of the local transportation committee of the City Council of Chicago, Ill., on Feb. 19, Walter L. Fisher, counsel for the committee, was directed to prepare a bill which would make possible the granting of a fifty-year franchise to the consolidated surface and elevated lines and provide for their acquisition by the city at any time during the period of the franchise. The bill previously proposed by the committee was for a thirty-year period and included a clause which prohibited the city from taking over the property until a certain per cent of the capital had been amortized. With this clause inserted, Mr. Fisher stated that the thirty-year franchise was of no consequence and that the city might as well grant a fifty-year franchise with the city having power to take over the property at any time. L. A. Busby, president of the Chicago Surface Lines, told the committee that it would be impossible to finance the proposition on a thirty-year franchise unless the per cent of the capital should be fixed upon that was to be amortized before purchase by the city became possible.

With these differences before the Council committee, the fifty-year franchise bill was ordered drawn, and will be brought before the committee together with the thirty-year franchise bill for joint discussion at the next meeting.

Great Northern Considering Electrification

The Great Northern Railway is making a study looking toward the possible electrification of some 300 miles of its main line between Spokane and Seattle. Engineers from the Westinghouse and General Electric companies are working up preliminary data at the present time, and no decision as to the character of the installation has been made. However, it is anticipated that the company will proceed with this project in 1918, though nothing has been authorized as yet. The project has been initiated because of the successful operations of the Chicago, Milwaukee & St. Paul's electric zone. Whether or not it is to be carried out in the immediate future depends upon developments in the foreign and domestic situation during the next few months, the programs for improvements on Western railroads in general being held largely in abeyance just at present.

$800,000 Project for Newark

Extensions of Hudson River Tunnels System to New Newark Terminal

Thomas N. McCarter, president of the Public Service Railway, Newark, N. J., outlined on Feb. 19 a plan before Mayor Thomas L. Raymond in Newark for an underground extension of the tracks of the Hudson & Manhattan Railroad in Newark, with a terminal under the apex of Military Park and Park Place in that city. The project is designed to connect the tube line with the Public Service Railway terminal on Park Place.

For more than a year past the Pennsylvania Railroad and Public Service Railway have been negotiating with reference to a combination of their terminal facilities in Newark.

It is proposed to abandon the present Park Place Station of the Pennsylvania as a terminal and to utilize the ground now covered by it to depress the tracks below street grade; to cause the tracks thus depressed to cross underneath Park Place and Center Street at their junction and continue under Park Place and a limited portion of Military Park to a sub-surface station located approximately at the apex of the park, which sub-surface station will be provided with convenient and direct means of ingress and egress to Broad Street and to the concourse floor of the Public Service Railway terminal.

By this means the whole Public Service Railway system, local, suburban and interurban, will be brought into direct connection with the high-speed line of the Pennsylvania Railroad and the Hudson & Manhattan Railroad to uptown and downtown New York, and, through it, with the whole metropolitan transportation system with which it connects.

This plan is a return, in an enlarged sense, to the original location proposed by the Pennsylvania for its terminal in Newark, which at the time was favored by the city authorities, but which was abandoned because the necessary enabling act passed by the Legislature of 1910 was vetoed by Governor Fort. The construction of the Public Service Railway terminal in the meantime has accentuated the desirability of this location for the terminal.

Railway Men on Defence Committee

Matthew C. Brush, president of the Boston Elevated Railway; P. F. Sullivan, president of the Bay State Street Railway; Clark V. Wood, president of the Springfield Street Railway and the New England Street Railway Club, and C. D. Emmons, general manager of the Boston & Worcester Street Railway, have been added to the Massachusetts transportation committee which is investigating railway co-operative measures related to the present international crisis. Many men well known in the engineering and utility fields are associated with the main organization, under the chairmanship of James J. Storrow of Lee Higginson & Company, Boston. Among the members of the committee on industrial survey are Howard Rogers, of the Stone & Webster Engineering Corporation, Boston, vice-chairman, Walter C. Fish of the General Electric Company, Lynn, Mass., and Howard Coonley of the Walworth Manufacturing Company, South Boston. Fred T. Ley of F. T. Ley & Company and G. Dresser, superintendent of the New England Telephone & Telegraph Company, are members of the committee on emergency help and equipment. At a meeting of the executive committee in Boston on Feb. 19 General Sir Sam Hughes, former organizer of the Canadian overseas expeditions, conferred with those present upon preparedness problems from the standpoint of civilian aid.

Increase in Wages in Fargo.—C. P. Brown, general superintendent of the Fargo & Moorhead Street Railway, Fargo, N. D., has announced an increase in the wages of the trainmen in the employ of the company. The employees have been receiving from 19 to 24 cents an hour, based on length of service. Under the new scale the men will receive from 20 to 25 cents an hour.

Bill to Provide Steam and Street Railway Connection.—Representative Gans of Philadelphia, Pa., has introduced a bill into the Legislature of Pennsylvania, amending the public service law so as to provide for switch and other connections between street railways and steam railroads when required by the Public Service Commission, and establishing through and joint fares.

Electrification Nearing Completion.—The work of electrifying the West Side line of the Southern Pacific Company into Corvallis, Ore., is practically completed, and it is expected the line will be ready for operation before April 1, the official date for the opening. McCoy, 8 miles south of Whiteson, has been the northern terminus of the electric division of the Southern Pacific Company.

Franchise Controversy in Muskegon.—A controversy has developed between the Muskegon Traction & Lighting Company, Muskegon, Mich., and the city over conditions of the street railway franchise of the company, which has until 1931 to run. Officials of the company have announced their willingness to enter into negotiations for a new grant, but only on condition that the validity of the present rights of the company to operate be not contested by the city in court.

Savings Bank Reviews Toledo Utility History.—The Home Savings Bank of Toledo, Ohio, issues an eight-page monthly business letter for the purpose of giving its depositors and customers information concerning the business life of the city. The current issue contains an historical sketch of the Toledo Railways & Light Company, operated by Henry L. Doherty & Company. The article briefly reviews the inception of the Toledo Gas Company in 1853, the securing of a franchise for the operation of a street car system, and finally the merging of several companies into the Toledo Railways & Light Company.

Payment of Strike Damage Award Advised.—The Board of Supervisors of Erie County, N. Y., has been advised by the County Attorney to pay the judgment of $2,862 returned against it by a jury in Supreme Court in favor of the International Railway, Buffalo, N. Y., for damages to the company's property during the street car strike riots several years ago. It is said that if the International Railway appeals the case on the ground that the verdict was too small, the county will file a cross appeal. The company asked for more than $100,000 damages, including the losses in fares. The award of the court was made for damage to the physical property only.

N. Y. C. Improvement Opposed.—The Public Service Commission for the First District of New York, in response to the request of Governor Charles S. Whitman, has directed its engineers and experts to furnish the Governor with estimates of the value of the lands and rights to be conveyed to the city of New York by the New York Central Railroad and by the city to the railroad under the proposed so-called West Side agreement. The plan is an ambitious one, and involves electrification of the lines affected. At the public hearings which have been held on the matter considerable opposition has developed on the part of the public to certain features of the plan.

Important Bills in Ohio.—The Chapman bill, which, if passed, will impose upon Ohio the terms of the Clayton Federal law relating to injunctions in labor disputes, has been recommended by the labor committee of the House and will be placed upon the calendar. It legalizes boycotting, picketing and personal persuasion, makes labor a personal rather than a property right, prohibits injunctions in labor troubles and declares that no indictments shall be returned against persons for performing acts which are not forbidden to the individual. In the House Harry Israel has presented a bill which, if enacted, will bring municipally owned utilities under the supervision of the Public Utilities Commission.

Canadian Northern Railway Plan Opposed.—The Hydro-Electric Commission of the Province of Ontario, Canada, is opposing the application which has been made to the Dominion Parliament by the Canadian Northern Railway for approval of its plan for a railway through Halton, Wentworth and Lincoln Counties. This is part of the proposed $7.000,000 double-track line to connect Toronto, Ont., with the Niagara frontier at Niagara Falls. The commission has addressed communications to the village authorities along the proposed route claiming that approval of the Canadian Northern Railway's plan would be detrimental to the development of the proposed hydroelectric proposition connecting Toronto with Niagara Falls, Ont.

Nine-in-Eleven-Hour Bill Opposed.—William Bradley, president of the Cumberland County Power & Light Company, Portland; Judge Newell, representing the Lewiston, Augusta & Waterville Street Railway; John A. Morrill, representing the Rockland, Thomaston & Camden Street Railway, Rockland; George L. Emery, representing the Biddeford & Saco Railroad, and Thomas Lee, representing the Aroostook Valley Railroad, Presque Isle, and others appeared before the committee on labor of the Maine Legislature recently in opposition to the so-called nine-in-eleven hour bill for electric railway employees, presented to that body. This measure was noted briefly in the ELECTRIC RAILWAY JOURNAL for Jan. 27, page 178.

Projected Subway for Madrid.—According to *Vida Financiera* (Madrid), the Spanish Ministerio de Fomento has granted a concession, under date of Jan. 12, to Don Miguel Otamendi for the construction and working, for a period of ninety years, of an underground electric railway system in Madrid, to be known as the Metropolitano de Madrid Alfonso XIII. There will be four double-track lines. The capital necessary for the construction of the complete system, embracing a total distance of 8.7 miles, is approximately $6,000,000. A period of eight years will be allowed for the completion of the undertaking. The first line to be constructed will cross the city from north to south; it will be 2.5 miles long, and is estimated to cost $1,600,000. Work is to be commenced shortly. This section must be completed within three years.

Financial and Corporate

Electric Railway Statistics

Returns for November, 1916, Compared with Those for the Corresponding Month of 1915, Show That Operating Ratio Is Increasing

A comparison of electric railway statistics for November, 1916, with figures for the corresponding month of 1915, made by the information bureau of the American Electric Railway Association, indicates an increasing growth in the operating ratio. Data for November, representing 7502 miles of line of companies scattered throughout the country, indicate an increase in operating revenue of 3.65 per cent and in operating expenses of 8.50 per cent, but a decrease in net earnings of 3.83 per cent. Data representing 5707 miles of line show an increase in the amount of taxes paid of 26.03 per cent and a decrease in the operating income of 12.29 per cent.

Of the groups shown in the accompanying table, data for the Western, represented by 1808 miles of line, indicate an increase in operating revenues of 5.09 per cent, in operating expenses of 5.49 per cent and in net earnings of 4.38 per cent. Data for companies represented by approximately 90 per cent of this mileage show an increase in the amount of taxes paid of 5.90 per cent, while the operating income increased 3.03 per cent.

The Southern district makes the next best showing. Data for companies represented by 824 miles of line indicate an increase in operating revenues of 5.70 per cent, in operating expenses of 7.20 per cent and in net earnings of 3.70 per cent. The amount of taxes paid by companies represented by about 570 miles of line increased 19.27 per cent, but in spite of this there is shown an increase in operating income of 2.94 per cent.

REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR NOVEMBER, 1916

	Companies Not Reporting Taxes		Companies Reporting Taxes	
	Amount	Per Cent Increase	Amount	Per Cent Increase
*United States**				
Operating revenues	$16,408,227	3.65	$13,963,989	1.99
Operating expenses	10,421,543	8.50	8,800,554	7.48
Net earnings	5,986,684	†3.83	5,163,435	†6.18
Taxes	....	...	1,106,304	26.03
Operating income	....	...	4,057,131	†12.29
Operating ratio, per cent:				
1915	63.51	...	63.02	....
1916	60.68	...	59.80	....
Miles of line represented	7,502	...	5,707	....
*Eastern District**				
Operating revenues	$11,908,196	3.07	$10,106,494	1.00
Operating expenses	7,598,935	9.53	6,388,423	8.42
Net earnings	4,309,261	†6.64	3,718,071	†9.64
Taxes	....	...	807,345	34.12
Operating income	....	...	2,910,726	†17.14
Operating ratio, per cent:				
1915	63.81	...	63.21	....
1916	60.05	...	58.88	....
Miles of line represented	4,870	...	3,535	....
*Southern District**				
Operating revenues	$901,444	5.70	$598,848	5.23
Operating expenses	523,447	7.20	331,111	4.43
Net earnings	377,997	3.70	267,737	6.24
Taxes	....	...	60,842	19.27
Operating income	....	...	206,895	2.94
Operating ratio, per cent:				
1915	58.07	...	55.29	....
1916	57.26	...	55.72	....
Miles of line represented	824	...	570	....
*Western District**				
Operating revenues	$3,598,587	5.09	$3,258,647	4.58
Operating expenses	2,299,161	5.49	2,081,020	5.14
Net earnings	1,299,426	4.38	1,177,627	3.60
Taxes	....	...	238,117	5.90
Operating income	....	...	939,510	3.03
Operating ratio, per cent:				
1915	63.89	...	63.86	....
1916	63.65	...	63.52	....
Miles of line represented	1,808	...	1,602	....

*Groupings are as follows: *Eastern District*—East of the Mississippi River and north of the Ohio River. *Southern District*—South of the Ohio River and east of the Mississippi River. *Western District*—West of the Mississippi River.

†Decrease.

The Eastern district is apparently suffering not only from the after effects of the late labor disturbances in New York City, but as well from the constantly growing costs of materials and labor. Returns from companies represented by 4870 miles of line, or approximately 60 per cent of the total mileage shown, indicate an increase in operating revenues of 3.07, an increase in operating expenses of 9.53 per per cent and a decrease in net earnings of 6.64 per cent. The tax burden is also growing, the result being a decrease in operating income of 17.14 per cent.

For the last few months there has been apparent a continual growth in the operating ratio. For November the operating ratio of the United States as a whole increased from 60.68 in 1915 to 63.51 in 1916. The increase in the Eastern district was from 60.05 in 1915 to 63.81 in 1916, while smaller increases occurred in the Southern and Western districts.

Annual Report

N. Y., N. H. & H. R. R.—Affiliated Electric Lines

The annual report of the New York, New Haven & Hartford Railroad for the year ended June 30, 1916, contains income statements for its various affiliated electric lines, as shown in detail in the accompanying statement. All of these companies, with the exception of the New York, Westchester & Boston Railway, are controlled through the ownership of all the stock, the percentage of control in the excepted case being 98.4 per cent. All are controlled directly except The Connecticut Company, which is held through the New England Navigation Company.

During the fiscal year ended June 30, 1916, all the affiliated lines operated at a loss with the exception of The Rhode Island Company and The Connecticut Company. Two of the four losing companies failed to meet operating expenses and taxes, but all showed an improvement in operating ratio over the preceding year. In most cases this resulted from decreased operating expenses. The operating expenses and taxes of the New York, Westchester & Boston Railway during the year amounted to 8.85 per cent in excess of the operating revenues, a decrease of 1.08 per cent from the percentage excess in 1915. The deficit as of June 30, 1916, was $5,795,233. For the Berkshire Street Railway the operating expenses and taxes were 82.42 per cent of the operating revenues, an improvement of 8.46 as compared to the percentage in 1915. The deficit at the end of the year totaled $462,372. The New York & Stamford Railway cut its operating and tax ratio by 0.72 per cent to 79.99 per cent, its total deficit amounting to $94,430, while the Westchester Street Railroad reduced its similar ratio by 0.95 per cent to 101.91 per cent. In this case the accumulated deficit at the end of the year was $92,638.

The operating revenue of The Rhode Island Company during the last year showed an increase of $400,737 or 7.8 per cent, which more than made up for the decrease of $295,011 in the preceding year. The operating expenses increased $139,430 or 4.0 per cent, however, so that the net operating revenue gained $261,306 or 15.9 per cent. Taxes rose $18,601 or 3.9 per cent, but the ratio of operating expenses and taxes to operating revenues was cut to 74.19 per cent, a decrease of 2.74 per cent. Non-operating income fell off, but income deductions were decreased to a greater extent, the final result being a gain of $249,002 from the deficit of $115,428 the year before. The credit to the profit and loss account as of June 30, 1916, was $885,145.

In the case of The Connecticut Company the gain in operating revenues amounted to $987,153 or 11.1 per cent as compared to a loss of $124,578 the year before. Operating expenses, however, rose $439,248 or 8.4 per cent, so that the net operating revenues gained $547,905 or 19.1 per cent. The showing was further bettered by a decrease in taxes of $112,062 or 21.4 per cent. The operating expenses and taxes were 67.66 per cent of the operating revenues, a decrease of 4.28 per cent from the 1915 percentage. Non-operating income fell off, but in spite of this, with income deductions showing a slight decrease, the net income rose $631,216 or about 47 per cent. In 1915 the company paid dividends of $400,000, a decrease of $1.100,000, but this year it paid $600,000 and carried forward a profit and loss credit of $2,129,366 as compared to $1,016,886 the year before.

INCOME STATEMENTS OF AFFILIATED ELECTRIC RAILWAYS OF NEW YORK, NEW HAVEN & HARTFORD RAILROAD FOR YEAR ENDED JUNE 30, 1916, WITH CHANGES FROM PRECEDING YEAR

	New York, Westchester & Boston Railway		Berkshire Street Railway		Rhode Island Company		New York & Stamford Railway		Westchester Street Railroad		Connecticut Company	
	1916	*Change*	*1916*	*Change*	*1916*	*Change*	*1916*	*Change*	*1916*	*Change*	*1916*	*Change*
Operating revenues	$513,325	+$63,445	$956,968	+$5,771	$5,484,874	+$400,737	$378,561	+$2,478	$252,276	−$5,874	$8,947,974	+$987,153
Operating expenses	438,730	+59,695	731,879	−70,880	3,577,704	+139,431	278,610	−8,308	244,693	−9,693	5,643,902	+439,248
Net operating revenue	$74,595	+$3,750	$225,089	$76,651	$1,907,170	+$261,306	$99,951	+$10,786	$7,583	+$3,819	$3,304,071	+$547,905
Taxes	120,025	+4,496	56,822	−4,857	491,312	+18,601	24,189	+7,572	12,410	+1,257	410,165	−112,062
Operating income	†*$46,430*	−$746	$168,267	+$81,508	$1,415,858	+$242,705	$75,762	+$3,214	†*$4,826*	+$2,562	$2,893,905	+$659,967
Non-operating income	52,752	+33,404	2,223	+551	119,783	−1,972	592	+130	337	+185	244,950	−30,553
Gross income	$7,322	+$32,658	$170,490	+$82,059	$1,535,641	+$240,733	$76,354	+$3,345	†*$4,489*	+$2,747	$3,138,856	+$629,414
Deductions from gross income	1,523,396	+99,033	*257,545	+51,025	*1,402,067	−8,270	*95,899	+847	*20,399	+4,292	1,184,182	−1,802
Net income	†*$1,516,074*	−$66,375	†*$87,055*	†$31,034	$133,574	†$249,003	†*$19,545*	†$2,497	†*$24,888*	−$1,545	‡$1,954,673	†$631,216

†Deficit.

*The 1916 deductions from gross income in the case of the Berkshire Street Railway include $213,199 for interest accruing to the New York, New Haven & Hartford Railroad, but not included in the income account of that company. Similar items included for other companies are as follows: Rhode Island Company, $195,008; New York & Stamford Railway, $38,569, and the Westchester Street Railroad, $19,126.

‡The Connecticut Company paid dividends of $600,000, an increase of $200,000, and had a surplus of $1,354,673 for the year, an increase of $431,216.

New Directors in St. Louis

Minority Interest, Voting Under the Cumulative Plan, Elect Four Representatives to the Board

The eleven directors of the United Railways, St. Louis, Mo., elected at the annual meeting held on Feb. 12 were: A. J. Siegel, G. W. Norton, John C. Roberts, John I. Beggs, A. C. Brown, Murray Carleton, D. R. Francis, Jr., Richard McCulloch, Henry S. Priest, A. L. Shapleigh and H. C. Cole. The new directors are: A. J. Siegel, St. Louis; H. C. Cole, Waterloo, Ill., John C. Roberts, St. Louis, and George W. Norton, Louisville, Ky. Breckenridge Jones and John L. Green failed of election. J. D. Mortimer, president of the North American Company, who was one of the 1916 directors, was not placed in renomination. The names of James Adkins, secretary and treasurer of the United Railways, and H. P. Hilliard, both of whom were directors last year, were not placed on the ticket.

Messrs. Siegel, Cole, Roberts and Norton, the new directors, were supported by the minority stockholders, who were represented by George Dieckman and Ephraim Caplan. The minority stockholders concentrated their voting power upon Messrs. Cole. Roberts, Siegel and Norton under the cumulative voting right secured to the stockholders.

Henry S. Priest, attorney for the company and a director last year, was re-elected. Considerable opposition had developed to Mr. Priest among minority interests in the company, but the vote of the minority, as previously stated, was concentrated upon Messrs. Cole, Siegel, Norton and Roberts.

At the meeting of the newly elected board of directors held on the afternoon of Feb. 20, all the old officers were reelected. A new executive committee was named composed of

J. I. Beggs, D. R. Francis, Jr., A. L. Shapleigh, A. J. Seigel and George W. Norton. Messrs. Seigel and Norton represent the minority stockholders. H. S. Priest was retained as general counsel in an advisory capacity, but with no reduction in salary. Thomas E. Francis, one of Mr. Priest's former assistants, was appointed general attorney and will take charge of all damage suits and litigation of a routine character. He will devote his entire time to the position with offices at the headquarters of the company.

U. R. R. Factions Come Together

New Tentative Reorganization Plan Appears Satisfactory to All Interests—Bonds and Common Stock Largely Substituted for Preferred

The two rival protective committees for the 4 per cent bonds of the United Railroads of San Francisco have come together and reached a tentative understanding regarding the reorganization of the company. Under the modified plan the new securities will be $47,698,000, instead of $47,598,000 as under the old plan, thus preserving practically all the proposed cut in capitalization from the $91,928,100 now outstanding. The character of new securities is changed, however, bonds and common stock being largely issued in lieu of preferred stock as originally proposed. Under the old plan the holders of the 4 per cent bonds were to receive 25 per cent of the face value of their bonds in new 5 per cent bonds and 46 per cent in 6 per cent preferred stock, a total of 71 per cent, while under the new plan they will receive 66 2/3 per cent in new 6 per cent bonds, 8 per cent in 6 per cent preferred stock, and 33 1/3 per cent in common stock, a total of 108 per cent. Moreover, an entirely new corporation to issue the new securities is proposed, instead of utilizing the existing subsidiary, the Market Street Railway, as the reorganization medium.

While the main features of the proposed changes appear to be satisfactory to all interests, no formal agreement has yet been made, and the details have not yet been worked out. When this has been done, the changes will be submitted to the bondholders and to the California Railroad Commission for approval. The original reorganization plan was described in the ELECTRIC RAILWAY JOURNAL of Oct. 7, 1916, page 744, and the opposition movement in the issue of Nov. 25, 1916, page 1127.

The tentative understanding now reached by the two protective committees was explained in a statement which was given out on Feb. 10 on behalf of both committees after conferences lasting nine days. In this statement it was said that the representatives of the protesting Eastern committee were now entirely satisfied with the work of the other or original reorganization committee, and that the successful consummation of the reorganization seemed assured. Regarding the tentative amendments to the plan, the statement said:

"It is believed by all that the recent decision of Circuit Judge Hunt, permitting the city to parallel the tracks of the United Railroads on Market Street, unless reversed by the Appellate Court, will create such a diminution of the company's revenues as to endanger the dividends on the preferred stock which the bondholders were to receive under the present plan, in view of the large annual payments which were necessary to be made for the retirement of the $2,500,000, of proposed debentures prior to 1924. For that reason, it is the unanimous opinion that a change in the plan is imperative, in order to eliminate the debentures and to provide for the raising of $2,200,000 in cash in some other way.

"The plan which seems most practicable is to use the net income of the company up to April 1, 1918, which it is estimated will amount to at least $2,200,000, for the purpose of retiring the matured $1,800,000 of Market Street 6 per cent bonds and $400,000 of Ferries & Cliff House 6 per cent bonds, and to issue to the bondholders, in consideration and exchange for the coupons of the present bonds which mature up to April 1, 1918, 6 per cent bonds of a new company to be formed of an equal face amount.

"To this end it is proposed to create a new corporation which shall succeed to the properties of the United Railroads of San Francisco and which will issue new 6 per cent bonds in the amount of $15,600,000, first preferred stock in the amount of $2,000,000, second preferred stock in the amount of $5,500,000, and $14,500,000 of common stock. The present bondholders will then receive 66 2/3 per cent of the face of the bonds which they now hold in 6 per cent bonds of the new corporation, 8 per cent in first preferred stock, and 33 1/3 per cent in common stock, a total of 108 per cent in bonds and stock of the new corporation for 100 per cent of their present bonds and 8 per cent of coupons.

"The unsecured creditors and stockholders will pay $3,000,000 in cash for $3,000,000 of Market Street 5 per cent bonds as and when it becomes necessary to raise this money for the purpose of paying off the $2,000,000 of Omnibus Cable Company bonds and $1,000,000 of Sutter Street Railway bonds which mature in 1918. In this way, all of the underlying bonds which are ahead of the Market Street 5 per cent bonds will be taken care of, and the present Market Street 5 per cent bonds will remain undisturbed, except for the issuance of the additional $3,000,000 of bonds at par.

"The unsecured creditors and stockholders will also surrender the unsecured notes which they now hold aggregating $3,665,000, and all their claims against the company for unpaid dividends on preferred stock, as well as all their preferred and common stock, and the company will surrender to them the notes of the Railroads & Power Development Company and the debentures of the United Railroads and of the United Railways Investment Company, as provided in the present plan."

Brooklyn (N. Y.) Rapid Transit Company.—The Public Service Commission for the First District of New York has before it for approval an application from the Brooklyn, Queens County & Suburban Railroad for permission to issue $299,543 of additional bonds.

Columbus Railway, Power & Light Company, Columbus, Ohio.—Proceeds of the $1,640,379 of 5 per cent bonds and $508,000 of Series A 6 per cent preferred stock of the Columbus Railway, Power & Light Company for the approval of the issue and sale of which application has been made to the Ohio Public Utilities Commission, will be used to reimburse the treasury of the company for capital improvements made in 1916 and for new extensions and additions in the current year. The principal capital improvement to be made this year by the company will be the construction of a new central generating station on which the initial expendiutre will be in excess of $1,000,000. The general plan for this improvement is referred to in this issue of the ELECTRIC RAILWAY JOURNAL, page 360.

Fitchburg & Leominster Street Railway, Fitchburg, Mass.—The Massachusetts Public Service Commission has authorized the issue of an additional $150,000 of 4½ per cent refunding bonds by the Fitchburg & Leominster Street Railway, due on Feb. 1, 1921, to refund $150,000 of first mortgage 5 per cent bonds due on April 1, 1917. This will make $300,000 of the 4½ per cent bonds outstanding. The total issue authorized is $350,000.

Pittsburgh (Pa.) Railways.—An offer has been made by the Philadelphia Company to give to each preferred shareholder of the United Traction Company 66 2/3 per cent of his holdings in a 5 per cent mortgage bond of the Pittsburgh Railways, to be guaranteed principal and interest by the Philadelphia Company; or, as an alternate proposition, to pay holders $25 in cash for each share of stock, the par of which is $50. The proposition was submitted by the management of the Union Traction Company to the protective committee for the preferred stockholders, looking toward a settlement of the present litigation. Stockholders who have not already deposited their certificates are urged by the protective committee to do so at once. In April, 1916, application was made to the Court for an order directing an inquiry into the transactions involving the stock of the United Traction Company and the reasons for the discontinuance of the payment by the Pittsburgh Railways of the 5 per cent dividend on the United Traction Company stock. At the hearing on this application the management of the United Traction Company denied that the net earnings of the company were large enough to pay fixed charges and a dividend of 5 per cent on the preferred stock and to show a surplus to the credit of the company if proper allowances were made for maintenance, etc.

Railways Company General, New York, N. Y.—At the annual meeting of the Railways Company General on Feb. 19 the retiring directors were re-elected with the exception of William H. Crook, whose place was filled by Evans R. Dick, Jr.

Reading Transit & Light Company, Reading, Pa.—The Reading Transit & Light Company, which is controlled by the Eastern Power & Light Corporation, has filed with the Pennsylvania Public Service Commission a petition for the purchase of the controlling interest in the United Traction Company. The Metropolitan Electric Company, controlled by the United Traction Company, has asked for permission to acquire the Edison Electric Illuminating Company and the Lebanon Valley Electric Light Company, both of Lebanon, Pa. The consolidation of the companies is a step in the direction of preparing for the further development of the street railway and electric power service in Reading and the Lebanon Valley, in accordance with the plan noted in the ELECTRIC RAILWAY JOURNAL of Feb. 10, page 267.

Seattle (Wash.) Municipal Railway.—According to figures by A. L. Valentine, superintendent of the Department of Public Utilities, Division "A" and Division "C," which constitute Seattle's municipal railway system, were operated from June 1, 1914, to Feb. 1, 1917, at a loss of $100,672, or an average for the entire period of $3,146 a month. Losses for January were $2,290. Of this loss, $528 is charged to Division "A," $1,593 to interest on Division "A" bonds, and $168 to operating loss on the Lake Burien line.

Sherbrooke Railway & Power Company, Sherbrooke, Que.—It is stated that 8000 of the 11,200 shares of the common stock of the Sherbrooke Railway & Power Company have been deposited under the exchange plan with the Southern Canada Power Company. The terms of the exchange were published in the ELECTRIC RAILWAY JOURNAL of Jan. 13, page 92.

Southern Cambria Railway, Johnstown, Pa.—The Southern Cambria Railway has been placed in the hands of the Cambria Trust Company, Johnstown, Pa., as receiver. This action is understood to be the direct outcome of a serious wreck on the road on Aug. 12, 1916. Shortly after the accident the railway was placed in the hands of James P. Thomas as trustee.

Third Avenue Railway, New York, N. Y.—The directors of the Third Avenue Railway have ordered payment of the full six months' interest, due on April 1, on the adjustment income 5 per cent bonds.

Toronto (Ont.) Railway.—At the annual meeting of the Toronto Railway on Feb. 7, George H. Smithers, Montreal, and Frank W. Ross, Quebec, were elected directors of the company to succeed W. D. Matthews and James Gunn, resigned.

Toronto (Ont.) Civic Railway.—The Toronto Civic Railway was operated by the municipality at a profit of $27,569 during 1916. The balance over operating expenses during 1915 was $10,459. The city operates the lines in the newer portions of the city, where the Toronto Railway has not been extended. The fares for adults are six tickets for 10 cents. Children are carried at half fare. More than 800,000 soldiers in uniform were carried free during 1916, as against about 187,000 during 1915.

Washington Water-Power Company, Spokane, Wash.—Although the number of car miles for 1916 exceeded those of 1915 by 53,000 and the car hours run showed an increase of more than 6000 over those of the previous year, the number of passengers carried by the Washington Water Power Company in Spokane, Wash., during 1916 decreased 112,903 as compared with the corresponding figure for 1915. This statement is made in a report recently submitted to the company's stockholders, which blames jitney competition for the decrease. The total net earnings during the year were $586,962. Total dividends of 4½ per cent were paid. Extensions and betterments amounted to $320,833, and the total assets at the close of the year were $27,360,058.

Dividends Declared

El Paso (Tex.) Electric Company, quarterly, 2½ per cent, common.

Northern Texas Electric Company, Fort Worth, Tex., 3 per cent, preferred; quarterly, 1 per cent, common.

Sheboygan (Wis.) Electric Company, quarterly, 1¾ per cent, preferred.

Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis., quarterly, 1¾ per cent, preferred.

Electric Railway Monthly Earnings

BATON ROUGE (LA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '16	$20.204	*$7,084	$13,120	$3,555	$9,565
1 " " '15	18,055	*8,354	9,701	3,175	6,526
12 " " '16	211,694	*100,858	110,836	42,003	68,833
12 " " '15	190,852	*108,205	82,647	26,946	55,701

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

1m., Dec., '16	$8,788	*$9,185	†$397	$1,121	†$1,518
1 " " '15	8,145	*8,318	†173	1,113	†1,286
12 " " '16	122,614	*109,113	13,501	13,286	215
12 " " '15	115,207	*96,433	18,774	13,493	5,281

CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.

1m., Dec., '16	$40,284	*$22,346	$17,938	$6,552	$11,386
1 " " '15	36,267	*19,625	16,642	6,536	10,106
12 " " '16	393,666	*231,265	162,401	78,327	84,074
12 " " '15	357,214	*206,428	150,786	79,172	71,614

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

1m., Dec., '16	$1,733,278	*$972,807	$760,471	$420,273	$340,198
1 " " '15	1,475,889	*760,857	715,032	405,890	309,142
12 " " '16	16,962,607	*9,276,038	7,686,569	5,034,827	2,651,742
12 " " '15	14,590,124	*7,788,455	6,801,669	4,506,082	2,295,587

GALVESTON-HOUSTON (TEX.) ELECTRIC COMPANY

1m., Dec., '16	$176,496	*$109,857	$66,639	$36,859	$29,780
1 " " '15	163,212	*106,445	56,767	36,597	20,170
12 " " '16	1,944,839	*1,236,107	708,732	438,993	269,739
12 " " '15	1,936,228	*1,206,457	729,771	433,308	296,462

GRAND RAPIDS (MICH.) RAILWAY

1m., Dec., '16	$119,184	*$61,871	$57,313	$17,740	$39,573
1 " " '15	112,010	*74,316	37,694	12,475	25,219
12 " " '16	1,297,586	*828,025	469,561	186,919	282,642
12 " " '15	1,176,450	*832,799	343,651	165,187	178,464

HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.

1m., Dec., '16	$29,777	*$15,081	$14,697	$5,240	$9,457
1 " " '15	26.887	*12,091	14,796	5,522	9,274
12 " " '16	326,398	*186,459	139,939	63,916	76,023
12 " " '15	276,660	*157,537	119,123	66,517	52,606

JACKSONVILLE (FLA.) TRACTION COMPANY

1m., Dec., '16	$62,300	*$38,149	$24,151	$15,552	$8,599
1 " " '15	53,618	*36,772	16,846	14,736	2,110
12 " " '16	627,193	*423,707	203,486	183,907	19,579
12 " " '15	611,568	*428,839	182,729	177,898	4,831

KEOKUK (IOWA) ELECTRIC COMPANY

1m., Dec., '16	$21,456	*$14,411	$7,045	$2,063	$4,982
1 " " '15	21,069	*12,481	8,588	1,859	6,729
12 " " '16	240,181	*160,855	79,326	23,626	55,700
12 " " '15	232,593	*151,156	81,437	22,400	59,037

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

1m., Dec., '16	$182,357	*$101,221	$81,136	$28,597	$52,539
1 " " '15	156,940	*93,912	63,028	29,250	33,778
12 " " '16	1,930,320	*1,157,078	773,242	346,929	426,313
12 " " '15	1,713,213	*1,049,709	663,504	330,817	332,687

PENSACOLA (FLA.) ELECTRIC COMPANY

1m., Dec., '16	$26,843	*$14,657	$12,186	$7,664	$4,522
1 " " '15	23,935	*13,008	10,927	6,884	4,043
12 " " '16	280,100	*157,336	122,764	92,675	30,089
12 " " '15	258,041	*146,819	111,222	85,705	25,517

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

1m., Jan., '17	$2,427,787	$1,385,416	$1,042,371	$813,804	$228,567
1 " " '16	2,153,920	1,200,538	953,382	816,777	136,605
7 " " '17	16,284,933	9,089,236	7,195,697	5,701 037	1,494,660
7 " " '16	14,570,892	8,160,473	6,410,419	5,712,571	697,849

TAMPA (FLA.) ELECTRIC COMPANY

1m., Dec., '16	$91,444	*$45,504	$45,940	$4,368	$41,572
1 " " '15	85,769	*44,325	41,444	4,345	37,099
12 " " '16	967,086	*527,719	439,367	52,414	386,953
12 " " '15	981,049	*502,901	478,148	52,343	425,805

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*Includes taxes. †Deficit.

Traffic and Transportation

Jitney Regulation More General

Nearly All Pacific Coast Cities Have Ordinances with Restrictive Provisions

Practically all of the cities of the Pacific Coast have adopted jitney ordinances with more or less restrictive provisions. The terms of the ordinances vary between wide limits, as does the rigidity with which the ordinances are enforced, but in certain fundamentals the majority of the measures enacted by the municipalities correspond. For example, definite routes are prescribed on which the buses must operate, making complete trips before turning. Bonds or insurance policies are required, the minimum liability ranging from $5,000 to $10,000. The license fees are assessed on various bases and vary from $10 to $60 per car per annum.

In San Francisco and, in fact, in most of the larger cities, the regulation of the buses is in the hands of the police department. In Los Angeles, on the contrary, the drafting and the enforcement of special traffic regulations for jitney buses is now in the hands of the Board of Public Utilities, whence it was transferred from the Police Department. Since this transfer a material improvement in traffic conditions is claimed to have been effected.

Unique among the plans under which jitney buses operate on the Pacific Coast is the franchise scheme in effect at Long Beach, Cal., where a carefully drawn up franchise was sold to the highest jitney bus bidder, as outlined in the ELECTRIC RAILWAY JOURNAL for Dec. 9, 1916. There has not yet been opportunity to study operating conditions under the franchise plan because the independent jitney drivers of Long Beach secured injunctions preventing the city from excluding them from streets on which the exclusive franchise was granted. The case is now being tried and meanwhile the independent jitneys are operating.

In at least six Pacific Coast cities the traction companies have put on motor buses of their own for auxiliary service in competition with or after the exclusion of the privately owned jitneys. At first some of these buses cost the companies considerably more than they took in in fares, but in recent months there has been some change in this situation. Although definite figures are not yet available, traction company officials have stated that the auxiliary service is a success in serving outlying districts. This is true particularly where the company is granted the exclusive right to operate such service.

Spokane One-Man Cars Approved

Arthur A. Lewis, chairman of the Public Service Commission of the State of Washington, and J. F. Reardan, inspector, recently inspected the lines of the Washington Water Power Company and the Spokane & Inland Railroad in Spokane, in reference to their use of one-man cars. They have approved the use of the cars on some of the lines of the Washington Water Power Company. The cars operated by the company are built according to the commission's recommendation, except that the knob on the emergency door at the back must be placed lower down. Permission to use the one-man cars is made conditional upon the use of two men on the cars during the rush hours. The Spokane & Inland Empire Railroad is now operating a one-man car on the Rockwood line, which is approved by the commission. Other lines of this company will be inspected for approval as soon as that company has cars to operate. In the case of the city of Spokane against the companies the Public Service Commission, as noted in the ELECTRIC RAILWAY JOURNAL for Jan. 27, page 184, decided that the companies should submit for the approval of the commission lists of routes on their respective lines upon which they desired to operate one-man cars and that such cars be inspected and approved by the commission before operation.

Hearing on Buffalo Service

Public Service Commissioner Will Recommend Survey of Traffic Conditions

Unusual interest was taken in the public hearing held in Buffalo, N. Y., on Feb. 17, before Public Service Commissioner Devoe P. Hodson of the Second District on complaints against the International Railway for alleged inadequate service. At the conclusion of the hearing, Commissioner Hodson announced that he would recommend to the commission that Charles R. Barnes, its traffic expert, make a survey of conditions in Buffalo and report his recommendations to the commission. The railway was represented by Edward G. Connette, president; E. J. Dickson, vice-president; Nelson H. Brown, general superintendent of transportation; T. W. Connette, superintendent of Buffalo city lines, and Thomas Penney, general counsel.

Almost every witness who appeared before Commissioner Hodson severely criticized union platform employees of the company and scores of suggestions were made for re-routing lines through the congested down-town business district; more efficient handling of workers in the north-end industrial centers and better lighting in the cars.

Explaining the causes of traffic delays during the last four months, Mr. Connette declared that an unusual amount of snow had fallen and that it has been a physical impossibility to remove the snow from the city streets. He produced figures to show that more than 60,000,000 cu. ft. of snow should be moved away in order to facilitate traffic and he called attention to the fact that if every vehicle was pressed into service it would take at least four months continuous work to remove this vast amount of snow. He told of an agreement between the city and the company whereby the city is to remove the snow and the company agrees to pay one-third of the cost.

Answering other complaints against the company's service, Mr. Connette told Commissioner Hodson that the company has under consideration plans for re-routing, thereby preventing congestion and over-crowding. He told Commissioner Hodson that the company has placed an order for fifty new cars of the most approved type, but they cannot be delivered until August. Thirty-two new cars are due immediately. A year ago the company had 568 cars in operation and 143 cars in reserve. At present the company has 667 cars in operation, forty-five of which are used exclusively by employees of the Pierce-Arrow motor plant.

David C. Howard, vice-president of the Buffalo Chamber of Commerce, made the following statement:

"At a meeting of the board of directors of the Chamber of Commerce, held on Feb. 13, the president submitted a message which authorized the formation of a special committee to investigate the street railway situation. Until this committee has had an opportunity to make its investigations and arrive at its conclusions, the chamber is in no position as an organization to submit complaints, but we wish at this time to have our presence recorded."

Petition for One-Man Cars

The Puget Sound Traction, Light & Power Company, Seattle, Wash., has petitioned the Council for authority to operate one-man cars on all lines where it is deemed advisable. The petition has been referred to the franchise committee of the Council. It reads as follows:

"Your petitioner has given much consideration to the subject of operating a safe and comfortable light car, which can be easily and safely run by one man. Your petitioner is ready to adopt cars of such character. It is now operating with entire satisfaction one such car on the Bellevue-Summit line in Seattle. If your petitioner should put a number of such cars in operation in Seattle, it would be enabled to give more expeditious and frequent service upon various lines. In order for it to purchase and put into use a considerable number of such cars, your petitioner prays that you enact an ordinance permitting the use of such cars generally throughout the city, so that your petitioner may, wherever it is advisable to use such cars, proceed to put them into service. Your petitioner submits herewith a Council bill, which it respectfully prays your honorable body to enact as an ordinance."

Abandonment Petition Denied

Commission Refuses to Upset Contractual Relation, Claiming Intervention Is Not Needed in Public Interest

Upon an opinion by Commissioner Emmet the Public Service Commission of the Second District of New York has denied the petition of the Freeport Railroad to cease the operation of its electric railway between the railroad station at Freeport, L. I., and the ferry during the winter months. The application is denied upon the grounds that though under a recent decision of the Appellate Division of the Supreme Court of New York the commission is held to have the power to modify franchise requirements as to fares, etc., this newly found power should be employed with great care. Mr. Emmet finds that in the present case the village board has expressly refused to modify the franchise requirement which compels the railroad to operate six trips a day in winter; that there is evidence that many people in Freeport and some transients would be inconvenienced by the discontinuance of this winter service, and that though past experience of the railroad produces figures which show the winter operation to have been unprofitable, Freeport is a growing community in which the winter business of the company may well improve.

In discussing the decision of the Appellate Division in the case of the New York & North Shore Railroad, referred to in the ELECTRIC RAILWAY JOURNAL of Feb. 3, pages 195 and 210, Mr. Emmet says that before this decision it was generally held that the commission had no power to modify the conditions of a franchise, and finds that the North Shore reasoning, though concerning rates of fare in franchises, must also be taken to extend to service matters. He says:

"Apparently we have the right to grant an application of this sort. We feel, however, that the circumstances surrounding this case are somewhat different from those which ordinarily accompany appeals to the Public Service Commission to employ discretionary powers which it has long been recognized to possess, and for the wise exercise of which it was in large part created. In this case the power we are asked to exert must be regarded as having been placed in our hands not so much by the deliberate action of the Legislature as by a more or less 'advanced' decision of the Supreme Court. And certain rather unusual complications exist in respect to the use which we are asked to make of our newly discovered powers. It is proposed that we shall upset what has always been regarded as a contractual relationship, against the will of one of the contracting parties. We are asked to reverse the judgment of another governmental body which until recently was supposed to be the only one which had any jurisdiction over this particular matter."

Mr. Emmet concludes that such powers should be exercised only when there is the "strongest evidence that our intervention is necessary in the public interest." He does not find such evidence in this case.

Traffic Survey Urged in Harrisburg

Demands for a survey of electric railway traffic in Harrisburg, Pa., are being made by the Harrisburg *Telegraph*. Under date of Feb. 17, that paper printed an editorial which is of interest as showing the viewpoint of the disinterested newspaper toward the street railway problem. The editorial does not blame the company. It merely wants things straightened out, and says: "The average citizen has no feeling either for or against the railway as such. He wants prompt and efficient service for his nickel, and beyond that he is not greatly interested."

Interviewed by the Harrisburg *Telegraph* on Feb. 19, Frank B. Musser, president of the Harrisburg Railways, declared that personally he favored such a survey as suggested, and stated he believed the board of directors would do the same. Mr. Musser was quoted in part as follows:

"We are interested in seeing what results are accomplished by those surveys. If anything of importance is accomplished by the work there we may take the matter up. We shall be guided largely in our decision by these reports.

"We are making every effort to work out our problems and are glad to receive suggestions from persons not connected with the company. More demands are made on the service now than in past years. Business has been greater every place than ever before and we have every car on wheels in operation in an effort to avoid congestion and crowded cars. General conditions are such that we cannot get new cars. Generally the company orders six or seven each year. This time we ordered ten, but we cannot get the deliveries through. The manufacturers have promised to try to get five of them to us by Memorial Day."

Safety-First Checks Distributed in San Diego.—Savings from the San Diego (Cal.) Electric Railways 1916 accident fund of $13,651, made possible by the work of its platform men in preventing accidents during the past year, were distributed on Jan. 31 by M. J. Perrin, superintendent of the company.

Interurban Benefit Association Prospering. — The Union Traction Mutual Benefit Association, organized among the employees of the Union Traction Company, Anderson, Ind., has now over 700 members on its rolls and the number is rapidly increasing. The Union Traction Company has guaranteed the payment of all benefits, and is furnishing free to the employees the services of its officers and the use of its offices.

Eastern Representatives Attend Western Stone & Webster Club.—The mid-winter meeting of the Stone & Webster Club of Washington at Seattle was dignified on the night of Jan. 26 by the presence of a member of the firm of Stone & Webster and several Eastern officials connected with the Boston organization. Edwin S. Webster, who had been in Seattle since the previous Sunday evening, was accompanied by F. S. Pratt, vice-president of the Stone & Webster Management Association and chairman of the board of the Puget Sound Traction, Light & Power Company, and D. P. Robinson, president, and G. O. Muhlfeld, manager, of the Stone & Webster Engineering Corporation.

United Traction Transfer Privileges to Be Withdrawn.—Upon the ground that the present tariffs of the United Traction Company, Albany, N. Y., effect an inequality between city passengers and those using the city and interurban lines, the Public Service Commission of New York, Second District, has permitted the company to put into effect on Feb. 25 its new tariffs withdrawing the transfer privileges to and from the Albany-Troy and Albany-Cohoes interurban lines and the city lines in all three cities. The company has announced that it will increase local service to take care of traffic heretofore carried on the interurban cars for points within the city lines, so that the transfer privilege within the cities will not be materially changed. The opinion of the commission, written by Commissioner James O. Carr, points out that under the present schedule city passengers in Troy are carried an average of 2 miles for 5 cents and in Albany 1.4 miles for 5 cents, while the interurban passengers using transfers under the present transfer system average probably more than 5 miles for 5 cents.

Serious Grade Crossing Accident in Louisville.—The most serious accident of years in Louisville, Ky., on Feb. 12, when a Southern Railway freight engine struck a loaded West Broadway car of the Louisville (Ky.) Railway at the Thirtieth Street grade crossing, has resulted in a general and apparently determined agitation in that city for elimination of grade crossings. There were four persons killed in the crash and thirty-seven more or less badly injured, several of whom are not expected to recover. According to best information obtainable, the car made the safety stop at the crossing; the motorman looked both ways; the conductor, seeing the gates up, gave the signal and the freight locomotive struck the car in the middle as it was crossing the rails. The accident occurred after dark and there is a difference of statements as to whether or not the railroad engine had a headlight lighted. The towermen were just changing watch and the bell was not sounded until the street car was on the track. One board of the City Council has adopted a resolution calling on the Louisville Railway to furnish a man to ride on cars and at the crossings of the steam railroad tracks to get off and make sure that no train is approaching.

Personal Mention

A. H. MacAdams has been elected president of the Slate Belt Electric Railway, Pen Argyl, Pa.

Dr. O. D. Schaffer has been elected secretary of the Slate Belt Electric Railway, Pen Argyl, Pa.

Thomas J. Ryan has been elected treasurer of the Slate Belt Electric Railway, Pen Argyl, Pa.

Frank Lugar has been appointed superintendent of the Shamokin & Edgewood Electric Railway, Shamokin, Pa.

Charles Herrick has been appointed master mechanic of the Reading Transit & Light Company, at Lebanon, Pa.

Perry Trimble has been elected secretary and counsel of the Chicago, Aurora & De Kalb Railroad, Aurora, Ill.

Earl Partrick has been appointed master mechanic of the San Francisco, Napa & Calistoga Railway, Napa, Cal.

W. H. Grimes has been appointed local superintendent of the Central Illinois Public Service Company, Anna, Ill.

R. L. Aage has been appointed general auditor of the American Public Utilities Company, Grand Rapids, Mich.

J. T. Kemp has resigned as general superintendent of the Sherbrooke Railway & Power Company, Sherbrooke, Que.

H. H. Lunsford has resigned as superintendent of the Southwestern Traction & Power Company, New Iberia, La.

F. X. Couture has been appointed railway superintendent of the Sherbrooke Railway & Power Company, Sherbrooke, Que.

F. C. Chisholm has been appointed power superintendent of the Sherbrooke Railway & Power Company, Sherbrooke, Que.

Charles O. Murphy has been appointed assistant general manager of the American Public Utilities Company at Grand Rapids, Mich.

M. B. Wheeler will be appointed commercial agent of the American Public Utilities Company, Grand Rapids, Mich., effective March 1, 1917.

T. A. Darrow has been appointed chief dispatcher of the Columbus-Dayton division of the Ohio Electric Railway to succeed W. L. Clayton.

L. B. Andrus has been appointed chief engineer of the American Public Utilities Company, Grand Rapids, Mich., succeeding B. T. Gifford.

F. G. Houser, formerly secretary-treasurer and auditor of the Boise Valley Traction Company, Boise, Idaho, will succeed H. F. Dicke as general manager.

J. G. Bouris, auditor of the Everett (Wash.) Gas Company, will succeed Ray Ballard as auditor of the Ottumwa Railway & Light Company, Ottumwa, Iowa.

G. E. Barber, assistant superintendent of the Columbus-Dayton division of the Ohio Electric Railway, has resigned. He has been with the company twelve years.

A. T. Longhurst has been been appointed general foreman of the Stamford shops of the New York, New Haven & Hartford Railroad, in charge of steam and electric equipment.

C. B. Jones has been appointed manager of the railway department, in addition to his duties as claim agent, of the Montgomery Light & Traction Company, Montgomery, Ala.

Roy Ballard, auditor of the Ottumwa Railway & Light Company, Ottumwa, Iowa, has been appointed auditor of the Fort Smith Light & Traction Company, Fort Smith, Ark.

C. H. Still has resigned as purchasing agent of the Pacific Power & Light Company, Astoria, Ore., to become purchasing agent for the Valley Mills purchasing bureau in Portland.

Alex Newhouse, for several years division shop foreman at Muncie, Ind., for the Union Traction Company, has resigned to accept a similar position with the Evansville (Ind.) Railways.

W. W. Waterson, of the Illinois Traction System, has been appointed superintendent of transportation of the Chicago, Ottawa & Peoria Railway and transferred to Ottawa, Ill., as headquarters.

Frank W. Brooks, president and general manager of the Detroit (Mich.) United Railway, has left on a two-months trip to California and Honolulu. He is accompanied by his wife and daughter.

Fred Connelly, formerly division man at New Castle, Ind., for the Union Traction Company of Indiana, has been appointed division foreman of the same company at Tipton, succeeding Alex Newhouse.

W. L. Clayton has been appointed assistant superintendent of the Columbus-Dayton division of the Ohio Electric Railway to succeed G. E. Barber. Mr. Clayton has been chief dispatcher for some years.

Samuel Riddle, superintendent of transportation of the L uisville (Ky.) Railway Company, has been elected a director of the Louisville Transportation Club, an organization of shippers and traffic men of that city.

Robert A. Smith, for a number of years master mechanic of the Shreveport (La.) Traction Company, has been appointed master mechanic of the Southwestern Traction & Power Company, succeeding H. H. Lunsford.

Ward Hubbard is assistant engineer, maintenance of way, Bay State Street Railway, Boston, Mass., and not engineer, maintenance of way, as stated in last week's issue. David Curtin is still engineer, maintenance of way.

J. H. Morris, formerly chief dispatcher of the Illinois Traction System, has been appointed superintendent of the Peoria Division of the St. Louis, Springfield & Peoria Railroad, with headquarters at Mackinaw Junction, Ill.

B. W. Arnold, who has resigned as superintendent of the Chicago, Ottawa & Peoria Railway, Ottawa, Ill., has been transferred to Peoria as secretary to H. C. Chubbuck, vice-president executive of the Illinois Traction System.

R. A. Riley has resigned as superintendent of equipment of the Birmingham Railway Light & Power Company, Birmingham, Ala., to accept a position with the sales staff of the Western Electric Company. He will travel in Alabama.

G. H. Losey, superintendent of maintenance of way of the railway electrical department of the Indiana Railways & Light Company, Kokomo, Ill., has been made electrical engineer in charge of the company's railway and lighting department.

P. W. Kurr, Lebanon, Pa., has been appointed cashier of the Reading Transit & Light Company, succeeding H. B. Daugherty, whose resignation took effect on Feb. 1. Mr. Kurr has been in the employ of the company as assistant cashier for two years.

P. H. Palmer, who for several years has been assistant general manager and electrical engineer of the Indiana Railways & Light Company, Kokomo, Ind., has been appointed general superintendent of the company to succeed T. C. McReynolds.

John A. Barhite, Special County Judge of Monroe County, New York, has been nominated by Governor Whitman as the successor to Devoe P. Hodson, on the New York Public Service Commission, Second District. The nomination has been sent to the Senate for confirmation.

Daniel J. Haren has resigned as general superintendent of the Syracuse & Suburban Railway, Syracuse, N. Y., to assume an important position in the transportation department of the Buffalo, Lockport & Rochester Railway of which Allen & Peck, Inc., are operating managers.

Charles Currie, whose resignation as vice-president and general manager of the Northern Ohio Traction & Light Company, Akron, Ohio, was recently announced in the ELECTRIC RAILWAY JOURNAL, has been elected president of the London (Ont.) Street Railway, succeeding E. W. Moore.

George W. Knox, second vice-president and general manager, Oklahoma Railway, Oklahoma City, Okla., has resigned, effective May 1. The directors of the company gave him a certified copy of resolutions, thanking him for his able services to the company through dull times, and expressing regret at his departure. It is understood Mr. Knox will return to Chicago to resume active work in business interests which he left to take charge of the Oklahoma company in 1911.

JAMES F. HAMILTON

James F. Hamilton, general manager of the Schenectady (N. Y.) Railway, has been appointed general manager of the New York State Railways, Rochester Lines, succeeding E. J. Cook. Mr. Hamilton, who has been a prominent figure in the electric railway field, entered the transportation department of the International Railway, Buffalo, in 1896, and after serving in various positions was placed in charge of one of the largest stations. He resigned his position with that company in 1902 to become assistant superintendent of the Schenectady Railway and was appointed superintendent of the company in 1909. In 1911 Mr. Hamilton was engaged as general superintendent of the United Traction Company, Albany, and was retained by the Schenectady Railway in an advisory capacity, and in 1912 he was appointed general manager of both companies, in which capacity he continued until 1914, when he relinquished his connection with the United Traction Company. Mr. Hamilton has been active in the work of the New York Electric Railway Association for a number of years, and has served on the executive committee, as vice-president and as president in 1914.

Thomas H. McGarry, for the past six years connected with the Bay State Street Railway, Boston, Mass., has been appointed purchasing agent of the company. Mr. McGarry started with the company at its Woburn office as stock clerk. At a later date he was transferred to the transportation department.

E. J. COOK

E. J. Cook, general manager of the New York State Railways, Rochester Lines, has been appointed chief engineer of all lines of this system, which include the city lines in Rochester, Syracuse, Utica and Schenectady, the third-rail line between Syracuse and Utica, and half of the interurban line between Schenectady and Albany. Mr. Cook was born in Springfield, Ohio, in 1865. After a preliminary education in the schools of this city he prepared for an engineering career at the Stevens Institute of Technology, graduating in 1886. He was engineer of construction and later superintendent of the Brooklyn Edison Company, and was vice-president of the Field Engineering Company, New York, during the period when many electric railway and lighting properties were designed and equipped, the railways changing from horse to electric cars. In 1895 he became active in the reconstruction and development of the Detroit (Mich.) Railway, and in 1896 he was appointed electrical engineer of the Cleveland (Ohio) Electric Railway, and five years later electrical engineer of the Cleveland City Railway. When these two properties were consolidated in 1903, Mr. Cook became electrical engineer of the entire system, remaining until 1907, when he was sent to Rochester, N. Y., as general manager of the Rochester Railway and the subsidiary electric railway companies in that vicinity, which later became consolidated into part of the New York State Railways. Mr. Cook is particularly well adapted for his new engineering position as he is pre-eminently an engineer with a keen ability to analyze problems by means of applied mathematics. He has been successful in utilizing this talent to advantage, even in the inexact field of transportation, where his studies in connection with trailer operation are especially noteworthy.

W. R. Barlow, formerly with the New York State Railways, Syracuse-Utica Lines, has recently been appointed to the position of assistant electric engineer with the Public Service Commission for the First District, New York. Mr. Barlow is a graduate of the Pennsylvania State College, class of 1909, and for five years after graduation had been with the General Electric Company in the railway engineering department.

J. E. Bassett has been elected secretary of the Dallas (Tex.) Northwestern Traction Company, which has arranged to build an electric railway from Dallas to Slidell, a distance of 60 miles. Mr. Bassett has been connected with the Texas & Pacific Railroad for more than thirty years and for the last twenty years has had charge of the purchasing department of the road under J. W. Everman and L. S. Thorne at Dallas, Tex.

Obituary

Maj. E. C. Lewis, formerly a co-receiver of the Nashville Railway & Light Company, Nashville, Tenn., is dead. Major Lewis was a well-known civil engineer and was also a publisher of the Nashville *Daily American* and a chairman of the board of directors of the Nashville, Chattanooga & St. Louis Railroad.

James Leitch, of the Supreme Court of Ontario, died on Feb. 8 at his home in Toronto. Mr. Leitch was the first chairman of the Ontario Railway & Municipal Board, from the time of its creation by the Ontario government in 1906 until his appointment to the Supreme Court in 1912. He was born in South Branch, Ont., and practised law for many years at Cornwall, Ont., until his appointment as chairman of the railway board. He was sixty-six years of age.

Edward Johnson, division superintendent of track and roadway, Chicago (Ill.) Surface Lines, died on Jan. 3 after a short illness. Mr. Johnson was born in Sweden, and was first employed in street railway work by the Western Chicago Railroad in 1893, which operated on the West Side in that city. He began work as a mechanic on the old Madison Street cable line, and was later promoted to assistant foreman, then foreman, and general foreman. In 1906 he was made assistant roadmaster of the Chicago Union Traction Company, and on Feb. 1, 1914, was made division superintendent of track and roadway, the position held at the time of his death.

John J. Burleigh, vice-president of the Public Service Corporation of New Jersey, Newark, N. J., and president of the Broadway Trust Company, Camden, N. J., died on Feb. 18 at his home in Merchantsville, in his sixty-third year. Mr. Burleigh rose to his late position of influence through a long series of activities in the utility and financial fields. At the age of fourteen, after a course in the public schools of Salem, he began the study of telegraphy. A year later he entered the service of the West Jersey & Seashore Railroad as station agent. While he was only eighteen Mr. Burleigh was made chief telegraph operator of the railroad and its leased lines. In 1883 he became assistant trainmaster and five years later trainmaster. Leaving the company in June, 1892, he started upon a series of successful utilities promotion enterprises, most of which were in South Jersey. He gave the city of Camden its first electric car, first telephone and first electric light. A telegraph line between Bridgeton and Port Norris was built by Mr. Burleigh in 1892, and a line from Woodbury to Penns Grove a year later. Other large operations were the Eastern Telephone Company, now a part of the Keystone system, and the Camden Lighting & Heating Company, which was taken over in 1903 by the Public Service Corporation. Until 1908 Mr. Burleigh continued as the Public Service executive in the Camden field. At that date he became a director and was soon made second vice-president, dividing his activities between the Camden and the Newark offices. His touch with Public Service employees was close. He was chairman of the public relations committee of the corporation and its subsidiaries, and took charge of the welfare work of the company from its inception in 1911. Mr. Burleigh had many other business interests and he had a large share in promoting the development of Camden. He is survived by seven children.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Coal District Power Company, Fort Smith, Ark.**—This company has just been organized at Fort Smith and incorporated under the laws of Arkansas for the purpose of constructing and operating electric street railway and interurban lines, and the production and distribution of electric current for light, heat and power. The company is capitalized at $120,000, of which $100,000 is common and $20,000 is 6 per cent preferred. Incorporators: L. A. Petit, Jr., L. E. Turner, G. W. Skow, Hugh Means and Albert Emmanuel. Officers of the company are: Hugh Means, president; G. W. Skow, vice-president, and L. E. Turner, secretary-treasurer. Headquarters will be maintained in Fort Smith. The organization of this company is the outgrowth of a recent visit to Fort Smith of Albert Emanuel, Schwind Building, Dayton, Ohio. Mr. Emanuel now controls traction lines in Lawrence and Parsons, Kan.; Fort Sheridan, Wyo., and Greenville, Tex. The company has taken option on the lighting plants in Greenwood, Huntington, Mansfield, Hartford and Booneville, and it is stated that these plants will be consolidated and all these towns will be connected by an interurban line.

FRANCHISES

Batavia, Ill.—By arrangement with the City Council the Aurora, Elgin & Chicago Railroad is to pay the city of Batavia $15 daily for a twenty-four-hour franchise, and the boycott of the city on that road has been ended. Trains now operate through the city.

South Hadley Falls, Mass.—The Holyoke Street Railway will receive a franchise from the City Council to construct an extension along West Main Street, to Canal, to Maple, to Taylor, to North Main Street.

Eastwood, N. Y.—The New York State Railways has asked the Council for a franchise to construct a loop in Eastwood.

New York, N. Y.—The Manhattan & Queens Traction Corporation has received a six months' extension of time on its franchise to construct an extension on Central Avenue to Springfield Avenue, St. Albans.

Bartlesville, Okla.—It is reported that the Oklahoma & Northern Traction Company, which proposes to construct an electric railway from Bartlesville to Miami, has received a franchise from the City Council of Bartlesville. W. K. Palmer & Company, Kansas City, Mo., engineers. [Jan. 13, '17.]

San Antonio, Tex.—The County Commissioners have granted the San Antonio Traction Company a permit to construct an extension along the Somerset Road from the city limits to Givens Avenue and thence on to South San Antonio, which is located about 6 miles south of the city hall.

Walla Walla, Wash.—The Walla Walla Railway Company recently applied to the Board of County Commissioners of Walla Walla County for a franchise to use a certain strip of land along Electric Avenue, in connection with the construction, maintenance and operation of side tracks.

TRACK AND ROADWAY

San Francisco, Napa & Calistoga Railway, Napa, Cal.—Another track, to provide better switching facilities, and in contemplation of increased freight traffic, will be laid by the San Francisco, Napa & Calistoga Railway from the foot of Georgia Street to the Monticello steamer wharf at the foot of Maine Street.

Attawaugan Street Railway, Danielson, Conn.—A committee consisting of Harry E. Back, William P. Kelley, Judge Sabin S. Russell, E. L. Darbie, Judge Oscar Atwood, Fred E. Bitgood and B. C. Hopkins, all of Danielson, appeared before the railroad committee of the General Assembly asking for an amendment to the charter of the Attawaugan Street Railway to allow a further extension of the proposed line beyond that contemplated in the original charter. The newly proposed line will start from Danielson, extending to Williamsville, Dayville, Attawaugan, Ballouville and Pineville. [Jan. 4, '13.]

Alton, Granite & St. Louis Traction Company, Alton, Ill.—The Public Utilities Commission of Illinois has rendered a decision which places the building of the extension to the line of the Alton, Granite & St. Louis Traction Company from the city limits of Alton to the site of the new State Insane Hospital in the hands of the Clark syndicate. The extension has been a matter of contention for two years.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—This company plans the rearrangement of its tracks through the southern part of the village of North Chicago, which will cut the number of curves from four within two blocks to two. Through the lengthening of the curve and elimination of reserve curves the cars will pass under the tracks of the Chicago & Northwestern Railway near the naval station depot on the east end.

Indiana Railways & Light Company, Kokomo, Ind.—At the annual meeting of the board of directors of the Indiana Railways & Light Company an appropriation of $300,000 to be expended this year in extending the street railway line and enlarging the power plant in Kokomo was approved.

Des Moines (Iowa) City Railway.—This company will construct a concrete viaduct at Twenty-fourth Street over High Street for the new Crocker Street car line. The structure will be about 175 ft. long and will cost about $5,000.

Kentucky Traction & Terminal Company, Lexington, Ky.—This company will relocate its tracks from the south side to the center of Georgetown Street from Fourth Street to the city limits, preparatory to the improvement of that thoroughfare.

***Grand Rapids, Mich.**—The construction of an electric railway is being contemplated from Grand Rapids to Ludington and Manistee, via Sparta, Kent City, Ravenna, Fremont, Shelby and Hart. B. F. Barendsen, Grand Rapids, is interested.

Helena Light & Railway Company, Helena, Mont.—Improvements to the amount of $80,000 will be made by the Helena Light & Railway Company to its system in Helena this year. The proposed improvements include the installation of new ties and heavier rails on the East Helena line; the reconstruction of the upper Broadwater line to a great extent, and the addition of several new cars.

Brooklyn (N. Y.) Rapid Transit Company.—The Public Service Commission for the First District of New York has decided to reject the one bid received on Feb. 7 from Charles Meads & Company, New York, to cover the cost of the relocation of the trolley tracks in New Utrecht Avenue, Brooklyn, between Thirty-ninth and Eighty-first Streets, The commission is advertising for new bids to be received on March 5. The commission decided to reject the bid received from Charles Meads & Company on the report of its acting chief engineer, who stated that the amount of the bid, $223,220, was approximately $5,000 above the estimates of the cost of the work made by the commission's engineers. The commission will extend the time within which the work may be completed in the hope that considerably lower prices will obtain when new bids are opened.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the First District of New York has been informed by its engineers that both tubes of the land tunnel under Willoughby Street and Montague Street, Brooklyn, between the Flatbush extension and Clinton Street are now "holed through" to the shaft at Clinton and Montague Streets. The south tube of the tunnel was "holed through" on Jan. 30 and the north tube last week. Work was begun on both tubes of this tunnel on March 10, 1915, at Willoughby Street and Flatbush Avenue extension and work was prosecuted westward. The tunnel will cost approximately $2,000,000.

Great South Bay Ferry Company, Freeport, N. Y.—The Public Service Commission for the Second District of New York has denied the petition of the Great South Bay Ferry Company to cease the operation of its trolley line between the railroad station and the ferry during the winter months.

Buffalo, Rochester & Pittsburgh Railway, Rochester, N. Y.—Among the improvements planned by the Buffalo, Rochester & Pittsburgh Railway in the near future is the electrification of its Indiana branch.

Piedmont Railway & Electric Company, Burlington, N. C.—It is reported that surveys are being made by the Piedmont Railway & Electric Company for the construction of an extension to Hopedale, 3 miles.

***Cleveland, Ohio.**—City Engineer Hoffman is preparing plans and estimates for a city-built subway to care for all street railway traffic between West Twenty-fifth and East Fourteenth Streets. These have been ordered by the city administration, which has announced that it proposes to ask for a bond issue election to get funds to build the subway. The plan calls for a street railway terminal in Public Square with the city owning both the subway and the terminal and leasing them to the traction company.

Youngstown & Southern Railway, Youngstown, Ohio.—Announcement has been made that within a year the project of the extension of this company's line connecting Youngstown directly with East Palestine will be under way. The addition will call for a comparatively short line extending from Columbiana or Leetonia to the eastern terminal at East Palestine.

Ardmore (Okla.) Railway.—Surveys are being made by the Ardmore Railway for a few miles of city and suburban extensions.

Tulsa (Okla.) Traction Company.—The interurban railroad now being built by this company from Tulsa to Sapulpa will be in operation within ninety days, according to officials of the road. The line will then be extended south to Henryetta, traversing the great oil and coal fields of Oklahoma. The section of the line between Tulsa and Red Fork will be in operation in less than thirty days.

St. Catharines, Ont.—It is reported that a belt line around St. Catharines will be built in connection with the hydro-radial line to be constructed from Port Credit to St. Catharines.

Buffalo & Lake Erie Traction Company, Erie, Pa.—This company reports that it proposes to double-track a number of its single-track lines in Erie and will construct extensions into outlying territory. The company will also purchase additional equipment. The plan proposed will cover a period of five years, such extensions and double-tracking being made as are found necessary for the growth of the city.

Philadelphia, Pa.—Bids were opened Feb. 6 by the Department of City Transit of Philadelphia for the construction of the Delivery Loop Subway in Arch, Eighth and Locust Streets. The lowest bidders on the following sections were: Contract No. 201, Arch Street between Broad and Eighth Streets, including two stations, Keystone State Construction Company, Philadelphia, $1,575.760; contract No. 202, Eighth Street between Arch and Locust Streets, including one station, Smith, Hauser & MacIsaac, Inc., New York, $2,420.303; contract No. 203, Locust Street between Eighth and Broad Streets, including two stations, Keystone State Construction Company, $1,713.715. Awards of contracts are being withheld pending action by the Public Service Commission of Pennsylvania.

Chattanooga (Tenn.) Traction Company.—Operation has been begun by the Chattanooga Traction Company on its line from Chattanooga to Red Bank, 8 miles.

Waco-Beaumont Railroad, Beaumont, Tex.—At a recent meeting of the committee named by the Waco and Beaumont Chambers of Commerce, permanent organization of the board of control of the proposed Waco-Beaumont Railroad was formed. The following officers were elected: C. R. Walden, Beaumont, president; Abe Gross, Waco, vice-president; William Sanger, Beaumont, secretary, and E. W. Marshall, Waco, assistant secretary. The officers will arrange for a survey of the line, the route to be selected to be the shortest distance between Waco and Beaumont. [Oct. 23, '15.]

SHOPS AND BUILDINGS

Interborough Rapid Transit Company, New York, N. Y.—A two-story brick and terra cotta railroad station, containing stores and offices, will be constructed by the Interborough Rapid Transit Company at University Avenue near Jerome Avenue at a cost of about $40,000.

POWER HOUSES AND SUBSTATIONS

Georgia Railway & Electric Company, Atlanta, Ga.—Plans are being prepared by the Georgia Railway & Electric Company for the erection of four new substations in order to carry more evenly the increased city arc-lamp lighting load. The changes will call for the revision of all of the thirty-eight arc-lamp circuits, which will require new wires and poles, etc.

New Orleans Railway & Light Company, New Orleans, La.—This company is increasing its generating capacity and making important changes in its boiler plant. One 15,000-kw. General Electric turbo generator unit was installed in March, 1916, and a duplicate unit will be put in service by November, 1917. These units will generate 60-cycle, three-phase current at 6600 volts. The boiler installation, which is double-decked, consists of 900-hp. units installed seven on the first level and six on the upper level. By means of changes in the furnaces and by the installation of Westinghouse Underfeed stokers, it is planned to increase the boiler capacity so that, except at peaks, the boilers on the lower floor will probably be able to handle the entire present load. These boilers on the lower floor are coal-fired. The boilers on the upper floor are oil-fired. An important change that is being made in the boilers is the lowering of the floors to increase the size of the combustion chambers.

Bangor Railway & Electric Company, Bangor, Me.—This company will construct a transmission line from the Ellsworth, Veazie and Milford stations to the Eastern Manufacturing Company, Lincoln, with whom it has contracted to supply 2000 electric horsepower. About $75,000 will be spent in building the line.

Helena Light & Railway Company, Helena, Mont.—This company will construct a power line to the Scratch Gravel district to supply electrical power to the various mining companies operating in that section. The line will probably be built this fall.

Richmond Light & Railroad Company, New Brighton, N. Y.—Plans are being considered by the Richmond Light & Railroad Company, it is reported, for the erection of an aerial cable from Linoleumville to Lake Island over Fresh Kill Creek, to supply light and power service.

Piedmont Railway & Electric Company, Burlington, N. C.—Work has been begun by the Piedmont Railway & Electric Company extending its power lines to Elon College and Gibsonville.

Northern Ohio Traction & Light Company, Akron, Ohio.—Plans are being prepared for rebuilding the electric plant at Kent, which was recently taken over by the Northern Ohio Traction & Light Company. It is proposed to use the power house for a substation to distribute electricity for lamps and motors in Kent.

Columbus Railway, Power & Light Company, Columbus, Ohio.—Plans have been completed by the Columbus Railway, Power & Light Company for the construction of a power house on the Hocking Valley Railway, 6 miles south of the city, to cost about $1,000,000. The Spring Street and Third Street stations will be closed and the plan of building on the bank of the Scioto River, just north of West Broad Street will be abandoned. It is stated that the company has already placed orders for a portion of the equipment for the proposed power house and that the right-of-way has been secured for the high-tension transmission lines into the city. It is expected that the station will be in operation some time during the coming fall.

Pacific Northwest Traction Company, Bellingham, Wash.—The City Council of Sedro Woolley is negotiating with the Pacific Northwest Traction Company for a new street lighting contract to cover a period of five years. Considerable changes will be made in the street lighting system if the contract is made.

Manufactures and Markets

Discussions of Industrial Conditions
A Department for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases **Business Announcements** **Trade Literature**

Buyers and Sellers Favor Uniform Catalog Size

Standardization Is Urged on the Basis of Conserving Printed Matter and Increasing Its Effectiveness

"Assurance has been given that a standardized catalog plan would have the support of most every wide-awake buyer and seller." This statement was recently made by W. L. Chandler, Dodge Manufacturing Company, Mishawaka, Ind., who also expressed his views on how catalogs and advertising literature could then be filed by the purchasing agent if published in uniform size by the manufacturer.

Mr. Chandler makes the prophecy that some generally-favored uniform catalog scheme will be in use before the end of five years. He urges attention to this subject because he believes a standardized catalog will reduce the cost of buying and selling.

"One of the biggest bugaboos of the buyer will then have vanished," he says. "He will no longer be compelled to find space in his files for an endless number of catalogs, price lists and data sheets ranging from single sheets of various sizes to bound books the size of a dictionary. All the data he possesses will be in one place. Tons of printed matter of possible interest to buyers for future reference will thus be saved from an untimely death via the waste basket route. Many circulars now escape the waste basket only when they pass through a buyer's hands at a time when he is in the market. After this prophecy shall have been realized, many of these will be saved by the buyers because they will have a place in which to file them conveniently for instant reference when occasion demands.

"A single standardized catalog of loose-sheet variety will furnish full information supplied by various sellers. This information will include price lists, weights, freight rates, discounts and any other data of value to the buyer. The standardized catalog has not as yet been adopted, but here is a method by which such a great time-saving device may and probably will be brought to a realization—perhaps in two years.

HOW TO PLAN THE WORK

"This catalog should be worked out through the co-operation of all national trade, engineering and other associations, together with such local organizations as may care to lend assistance. This co-operation can perhaps best be secured through a conference board composed of representatives of the organizations interested. Such a conference board may formulate certain definite recommendations, outlining the proposed complete plan of operation of the standardized catalog. In such a conference board the best interests of all industries, from the standpoints of both buyer and seller, would be served. These recommendations may be ratified by the various organizations, and the catalog will then become a reality as soon as equipment can be installed and loose sheets prepared and distributed."

Mr. Chandler has worked out a definite plan for a standard master catalog file with loose sheets 8½ in. x 11 in., to be kept in standard vertical letter files and indexed according to the Dewey decimal system now used by large libraries. He points out that if this plan or any other plan recommended by a general conference board is accepted throughout the various industries a great economy in the production of advertising literature and a saving in the cost of space for its filing will result. Simple means are available for keeping such a file up to date. One item of waste under present conditions is the large catalog which applies only in part to the business of one buyer. Small sections of such books when filed in a standard master catalog file could usually cover the needs of any buyer.

The standard size for advertising matter and data sheets and catalog pages was proposed and was thoroughly discussed some years ago by the Central Electric Railway Association which adopted uniform sizes. However, so many of the manufacturers selling to the members of that association are interested to a far greater extent in other parts of the electric railway industry and in other industries that they found it inadvisable to change existing standards where these did not meet the standards laid down by the Central Electric Railway Association. At this time, however, Mr. Chandler through the National Association of Purchasing Agents and through contact with the executives of a great many engineering and trade associations, hopes to be able to give impetus to the movement for a standardized catalog.

Annual Report of The J. G. Brill Company

Sales Increase 40 Per Cent During 1916—Prospect of Increased Sales During 1917

The sales value of the combined output for the calendar year 1916 of all the plants of the J. G. Brill Company, Philadelphia, Pa., amounted to $6,180,895, as compared to $4,903,510 in 1914 and $4,403,116 in 1915. The increase for the last year was $1,777,779, or more than 40 per cent. The result of operation for 1916, after deducting $376,475 for maintenance and depreciation, was a net combined profit of $93.257. This, combined with the preceding surplus, left a net surplus on Dec. 30, 1916, of $1,146,193 after the payment $1,146,193 after the payment of $183,200 in dividends. The record of sales since 1907 is as follows:

1907	$9,211,825.72	1912	$7,842,090.68
1908	3,845,173.91	1913	9,154,433.79
1909	4.261,204.90	1914	4,903.510.70
1910	5,960,778.61	1915	4,403.116.72
1911	5,870,907.47	1916	6,180,895.79

According to the annual report of the company, the general business of electric car and car truck manufacturing had shown such improvement in the latter part of 1915 that the management at the beginning of 1916 hoped for a return to normal conditions during the year. The company, however, carried over into 1916 orders taken in the previous year at very low prices and upon estimates based on the then lower costs of labor and materials. While the demand for cars and car trucks improved during 1916, it was not nearly sufficient in volume to meet the normal capacity of all the concerns engaged in the industry, and consequently it did not lessen very materially the severity of competition. In addition, the cost of raw materials entering into production and used for maintenance, accompanied by the difficulty of obtaining prompt delivery at any price, and the great scarcity and continuous increase in the cost of labor throughout the year seriously affected the ability of the management to execute orders at satisfactory costs and within reasonable and profitable time.

The principal orders for projectiles on hand at the beginning of 1916 resulted in far less profit than the management anticipated, largely owing to the fact that the subcontractors, with whom the company had arranged for material and for machining and completing shells from forgings made by it, failed to meet their engagements. This resulted in the cancellation by the purchasers of the unfinished portions of these contracts. While settlements which the company was able to make gave some profit from this activity, it was not sufficient to affect materially the general results for the year. The management, however, made no serious expenditures in machinery or equipment to engage in the manufacture of munitions, so that it has suffered no loss in the purchase of equipment fit only for such purpose.

On Feb. 9, 1917, the combined work on hand for cars, trucks, parts and miscellaneous material totaled $3,858,988, as compared to $2,058,918 the preceding year, while the work on hand for projectiles amounted to only $613,766, as compared to the preceding year's total of $2,741,197. The report states that there are prospects of increasing demands from electric railways during 1917.

Nominations for Federal Trade Board

President Wilson has sent to the Senate the nominations of former Governor Franklin Fort of New Jersey and William B. Colver of St. Paul, Minn., for the vacancies on the Federal Trade Commission created by the retirement of Edward N. Hurley and the fact that the Senate refused to confirm Commissioner Rublee, who has served for some time as a recess appointee, but who will not be nominated again.

Mr. Fort is a Republican, and resides at South Orange, N. J. He was born in that State in 1852, and is a graduate of Albany Law School, Rutgers College and New York University. From 1878 until the time he became Governor of New Jersey in 1908, in which position he served until 1911, Mr. Fort served on the judicial bench of New Jersey in various positions, ending with service on the Supreme Bench of that State.

Mr. Colver is a Democrat, forty-six years of age. For many years he was associated either as editor or publisher with the Scripps-McRae League of newspapers, the Newspaper Enterprise Association, etc.

The positions pay $7,500 a year. Mr. Colver is appointed to fill out Mr. Hurley's unexpired term and Mr. Fort is appointed for a term of six years.

Union Switch & Signal Plans New Shops

As noted last week, this company's machine shop and packing department were destroyed by fire on Feb. 10. However, the foundry, forge shop, pattern and carpenter shops and the general offices, which house the drawings, were untouched.

G. A. Blackmore, vice-president, Union Switch & Signal Company, has stated that "the buildings formerly used for munitions work (which work was completed last October), comprising over 65,000 sq. ft. of floor space, are immediately available, as is also certain space in our other undamaged buildings, and this space will be utilized for machinery formerly located in the destroyed building. Temporary buildings are also being erected. We also expect to utilize to the fullest extent practicable the offers of the associated Westinghouse companies to assist us in every way possible. Orders for large quantities of machine tools on which we are assured early deliveries have already been placed.

"Plans are well under way for a new permanent machine shop having a capacity much greater than the former one, and equipped with most modern machinery and appliances for the manufacture of signaling material. We have such confidence in our ability to continue the manufacture of our products that we are now ready to accept future orders subject to reasonable delays.

Heavy Copper Sales Reported

High prices of copper have brought to light supplies of the red metal that were not known to exist. It has been generally supposed that practically all of the first half copper had been contracted for by consumers. However, it is reliably reported that sales last week totaled between 25,000,000 and 30,000,000 lb., mostly in large lots. Several sales of small lots were reported at prices a cent or two above market quotations.

Buyers are still disinclined to anticipate their needs very far in advance. Most of the buying now is for early summer delivery.

Market quotations on Wednesday for electrolytic were as follows, showing a slight increase over last week: February, 36.5 cents; March, 36.25 cents, second quarter 34.5 cents; third quarter 31.5 cents and fourth quarter 30.25 cents.

CURRENT PRICES FOR MATERIALS

Quoted Wednesday, Feb. 21.

Copper (electrolytic)	New York, 36 cents per pound
Rubber-covered wire (base)	New York, 40 cents per pound
No. 0000 feeder cable (bare)	New York, 37½ cents per lb.
No. 0000 feeder cable (stranded)	New York, 35 cents per pound
No. 6 copper wire (insulated)	New York, 37½ cents per pound
No. 6 copper wire (bare)	New York, 37 cents per pound
Tin (straits)	New York, 48¾ cents per pound
Lead	New York, 9½ cents per pound
Spelter	New York, 10¾ cents per pound
Rails, A. S. C. E., O. H	Mill, $40 per gross ton
Rails, A. S. C. E., Bess	Mill, $38 per gross ton
Wire nails	Pittsburgh, $3 per 100 pounds
Steel (bars)	Pittsburgh, 3.25 cents per pound
Sheet iron (black, 28 gage)	Pittsburgh, 4.75 cents per pound
Sheet iron (galv., 28 gage)	Pittsburgh, 6¾ cents per pound
I-beams over 15 in	Pittsburgh, 10 cents per pound
½-in. galv. extra high strength steel wire,	New York, $6.82 per 100 ft.
⅜-in. galv. high strength steel wire	New York, $3.41 per 100 ft.
⅜-in. galv. Siemens-Martin wire	New York, $2.52 per 100 ft.
5/16-in. galv. Siemens-Martin wire	New York, $1.94 per 100 ft.
Galvanized barb wire and staples	Pittsburgh, 3.85 cents per pound
Galvanized wire (ordinary)	Pittsburghh, 3.65 cents per pound
Cement (carload lots) with rebate for sacks,	New York, $2.07 per barrel
Cement (carload lots)	Chicago, $1.96 per barrel
Cement (carload lots)	Seattle, $2.60 per barrel
Sand in large lots	New York, 50 cents per ton
Linseed oil (raw, 5-bbl. lots)	New York, 94 cents per gallon
Linseed oil (boiled, 5-bbl. lots)	New York, 95 cents per gallon
White lead (100-lb. keg)	New York, 9¾ cents per pound
Turpentine (bbl. lots)	New York, 52 cents per gallon

OLD METAL PRICES

Copper (heavy)	New York, 32½ cents per pound
Copper (light)	New York, 31½ cents per pound
Red brass	New York, 21 cents per pound
Yellow brass	New York, 19¼ cents per pound
Lead	New York, 8½ cents per pound
Steel car axles	Chicago, $34 per net ton
Zinc	8¾ cents per pound
Iron car wheels	Chicago, $18 per gross ton
Steel rail (scrap)	Chicago, $24.50 per gross ton
Steel rail (relaying)	Chicago, $34 per gross ton
Machine shop turnings	Chicago, $9.25 per net ton

Important Change in Supply Organization

The National Railway Appliance Company, a new concern, announces that it has taken over the entire railroad department business of the U. S. Metal & Manufacturing Company, which has been well represented in the supply business for the past sixteen years.

The new company will have temporary offices at 165 Broadway, New York City, and the officials elected are well known in the railway equipment field. B. A. Hegeman, Jr., president, was formerly in the railroad business. He started in 1878 with the D. L. & W. R. R., later being made general manager of the Lackawanna Live Stock Transportation Company. From this position he went with the American Car & Foundry Company as Eastern sales agent and in 1901 was selected as the president of the U. S. Metal & Manufacturing Company, which position he has occupied for the past sixteen years. Mr. Hegeman is vice-president of the New York & North Shore Traction Company, vice-president of the Damascus Brake Beam Company, Cleveland, Ohio; president of the Anglo-American Varnish Company, Newark, N. J.; chairman of the finance committee of the New York Railroad Club, and in 1914 was president of the Railway Supply Manufacturers' Association.

Charles C. Castle, first vice-president, has long been in the supply business. He was for many years vice-president of the Hildreth Varnish Company and became associated with the U. S. Metal & Manufacturing Company in 1910 as manager of the railroad department. He is vice-president of the Anglo-American Varnish Company, Newark, N. J., and secretary and treasurer of the Geneseo Corporation, Rochester, N. Y., and was president of the American Electric Railway Manufacturers' Association in 1911.

Harold A. Hegeman, vice-president and treasurer, has also been connected with the U. S. Metal & Manufacturing Company for the past nine years, as salesman, and is well known throughout New England and New York State among steam and electric railway officials.

F. C. Dunham, assistant to the president, has been with the U. S. Metal & Manufacturing Company for the past thirteen years as special sales agent and during that period he has made a wide acquaintance among railroad officials through the promotion of the sales of the Dunham hopper door device.

Edward D. Hillman, secretary and engineer, graduated from Lehigh University in 1898, with the degree of mechanical engineer. He was connected with several manufacturing concerns as engineer during the next four years, entering the employ of the New York Central & Hudson River Railroad in February, 1902. From 1902 to 1905 he was in the motive power and rolling stock department, going to the electrical department in December, 1905, where he remained until February, 1906, when he entered the employ of the U. S. Metal & Manufacturing Company as mechanical engineer.

The company has established a branch office in the McCormick Building, Chicago, Ill., under the management of Walter H. Evans. A branch office has also been opened in the Munsey Building, Washington, D. C., under the management of J. Turner Martyn. Both managers were formerly connected with the railroad department of the U. S. Metal & Manufacturing Company.

ROLLING STOCK

Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., is reported to be in the market for four cars.

Helena Light & Railways, Helena, Mont., is reported to be considering the purchase of several new cars.

Goldsboro (N. C.) Electric Railway is said to be in the market for some new equipment.

London & Port Stanley Railway, London (Ont.), Canada, expects to purchase a motor freight car at a cost of $23,500.

Michigan Railway, Kalamazoo, Mich., has ordered from the St. Louis Car Company one 60-ft. motor baggage car which will be equipped with Baldwin trucks.

New York State Railways (Syracuse Lines), Syracuse, N. Y., are in the market for thirty-five double-truck center-entrance cars.

Three Rivers Traction Company (Que.), Canada, has ordered three light-weight, safety, one-man cars from the St. Louis Car Company.

Johnstown Traction Company; Johnstown, Pa., is reported to have placed an order with the St. Louis Car Company for ten double-truck cars.

Northern Ohio Light & Traction Company, Akron, Ohio, has ordered from the St. Louis Car Company four 60-ft. baggage and express cars. Two of the cars will be equipped with St. Louis trailer trucks and two with Baldwin motor trucks.

American Railways, Philadelphia, Pa., has ordered six double-truck city cars from the St. Louis Car Company for the Roanoke Electric Railway. This company is also reported to have purchased ten cars from the J. G. Brill Company for the Wilmington & Philadelphia Traction Company.

TRADE NOTES

William J. Hammer, consulting electrical engineer, announces the removal of his office to 55 Liberty Street, New York City, suite 2510, Liberty Tower Building.

R. H. Harper has resigned as general sales manager of the B & K Manufacturing Company and has joined the sales organization of the Western Electric Company at the Philadelphia office.

Veeder Manufacturing Company, Hartford, Conn., has issued catalog No. 120 on its speed counters, tachometers and tachodometers. In addition to recording and speed counters, this company also manufactures fine die castings.

F. L. Gordon has been appointed assistant to the vice-president, and **L. R. Dewey** has been made Western sales manager of the American Brake Shoe & Foundry Company, with headquarters at Chicago.

John A. Foulks, who has been associated with the Indianapolis Switch & Frog Company for the last eight years, and who is now Eastern representative of the company, has sent in his resignation effective March 1.

J. G. White Company, New York, N. Y., announces the election as vice-president of the company of Russell B. Marchant, formerly treasurer of the company; Douglas I. McKay, formerly assistant to the president, and Sanger B. Steel, formerly manager of the Paine-Webber & Company, Chicago.

E. A. Garrett, who for the past four years has been publicity manager for the Busch-Sulzer Brothers-Diesel Engine Company of St. Louis, has resigned to accept a position with the Boston (Mass.) Belting Company. Prior to his connection with the Diesel Engine Company Mr. Garrett was manager of the Twinplex Sales Company.

American Institute of Consulting Engineers, Inc., New York, N. Y., at its annual meeting on Jan. 15, elected A. M. Hunt, Lewis B. Stillwell, William J. Wilgus and Gardner S. Williams members of the council to fill the places of retiring members. At the council meeting on Feb. 6 the following officers were elected for the year 1917: George Gibbs, president; Lewis B. Stillwell, vice-president, and F. A. Molitor, secretary and treasurer.

Walter A. Zelnicker Supply Company, St. Louis, Mo., has purchased the Idaho Southern Railroad, which operates between Gooding and Jerome, Idaho, and the Milner & North Side Railroad, a short line extending from Milner to Oakley, Idaho. These roads, which comprise a total of approximately 50 miles, were built only a few years ago by Pittsburgh capital. The purchasers will dismantle the roads and sell the rails and other equipment, which are practically new.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has recently occupied a large four-story building situated on the corner of Thirty-sixth Street and Tenth Avenue, New York City. The entire building is being utilized as a service station, repair shop and warehouse. It is equipped to handle repairs of every kind, type and size of electrical machinery, and will employ more than seventy men.

McQuay-Norris Manufacturing Company, St. Louis, Mo., announces that J. H. Bishop, P. T. Egbert, Arthur F. Frost, J. H. Griffith, George Heidenreich and G. T. Parsons have joined the forces of the company. Mr. Bishop is assigned to the Kansas City office, Mr. Frost to the Dallas office, Messrs. Parsons and Egbert to the New York office, Mr. Griffith to the Pittsburgh office and Mr. Heidenreich to the Cincinnati office. All these men are graduate mechanical engineers.

ADVERTISING LITERATURE

Electric Storage Battery Company, Philadelphia, Pa., has issued bulletin 160 on its "Iron-Clad Exide" batteries for storage battery industrial trucks.

Central Electric Company, Chicago, Ill., has issued bulletin No. 45 on its Balco line of detachable plugs and receptacles for shops, round houses, factories, docks and terminals.

Mesta Machine Company, Pittsburgh, Pa., has issued bulletin D on its automatic plate valves for use in both new and rebuilt air and gas compressors, ammonia compressors, vacuum pumps and blowing engines.

Locke Insulator Company, Victor, N. Y., is distributing supplement No. 1 to its insulator book. This book presents ten designs of insulators for voltages ranging from 27,000 to 80,000.

H. M. Byllesby & Company, New York, N. Y., announce that exceptionally complete annual reports showing the progress made by Standard Gas & Electric Company and the Northern States Power Company will be sent to investors.

Railway Improvement Company, New York, N. Y., has issued a booklet on "A Few Words to Motormen About Rico Coasting Recorders." It explains how the avoidance of certain operating faults by motormen will result in more coasting, less energy consumption and greater safety. The illustrations are of cartoon type. The booklet was prepared as a part of the educational service which this company gives to users of Rico coasting recorders, but the company will be pleased to furnish copies on request.

Electric Railway Journal

Published by the McGraw Publishing Company Inc.
Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Vol. XLIX NEW YORK, SATURDAY, MARCH 3, 1917 Number 9

McGraw and Hill Publishing Companies Consolidate

THE McGraw Publishing Company, Inc., and the Hill Publishing Company have been consolidated as the McGraw-Hill Publishing Company, Inc. The new company acquires all the properties and interests of the two constituents, including the following technical journals: ELECTRIC RAILWAY JOURNAL, *Electrical World*, *Electrical Merchandising*, *Engineering Record*, *Metallurgical & Chemical Engineering*, *The Contractor*, *American Machinist*, *Power*, *Engineering News*, *Engineering & Mining Journal*, and *Coal Age*. Two of these papers, *Engineering News* and *Engineering Record*, will be consolidated under the name *Engineering News-Record*, with Charles Whiting Baker, now editor of *Engineering News*, as editor-in-chief.

James H. McGraw will be president of the new company, Arthur J. Baldwin (now president of the Hill Publishing Company) vice-president and treasurer, and E. J. Mehren vice-president and general manager.

IMPORTANT EVENT IN TECHNICAL JOURNALISM

The editors of the ELECTRIC RAILWAY JOURNAL take pleasure in making the announcement printed above. Each of the Hill papers, like each of the McGraw papers, has always been a leader in its field, and with the enlarged facilities for securing technical and industrial news which will be possessed by the combined organization, the ELECTRIC RAILWAY JOURNAL will be in an even better position than ever before to serve its readers. Of the group of eleven papers of which Mr. McGraw is now the head the one with which he has been longest identified is the ELECTRIC RAILWAY JOURNAL. This he acquired in 1889, when it was known as the *Street Railway Journal*. The *Electrical World* was purchased in 1899, the *Engineering Record* in 1902 and the other properties of the McGraw Publishing Company at later dates. The Hill properties were brought together gradually under somewhat similar conditions by the late John A. Hill. The present consolidation is an eminently logical one, as all the periodicals are technical journals and together they cover the five major engineering fields of civil, mechanical, electrical, mining and chemical engineering. They are animated by the same high standards, and can be of great assistance to each other in solving the problem of giving their subscribers and advertisers the best possible service.

GROWING TAXATION BURDEN

The industry is told once again, through the paper of Mr. Rand before the New York Electric Railway Association this week, that the tax question is of great and growing importance to-day. This is a truth that no electric railway will deny. In analyzing the situation, however, there are two points that electric railway officials should bear in mind, *i.e.*, that if the nation's taxes rise legitimately, utilities may justly be expected to bear their just share, and that as much attention should be given to the problem of enforcing more wise and economical disbursements of the tax collections as to that of preventing inequitable extensions of the tax burden. These constitute the broader aspects of the case that are often lost to view. Ours is an expanding nation with growing needs, and many causes of the higher cost of government must meet with the sympathy of the public-spirited man or corporation. But if additional tax collections are made necessary only through extravagant public administration, then there is just cause for complaint. This very condition does exist to some extent without a doubt, and we feel, as Mr. Rand does, that it is encouraged by the lack of attention from business men. It is essential, of course, that electric railway officials and other business leaders should at all times endeavor to prevent the spread of pernicious taxation theories or the inequitable incidents of taxes under existing laws, but they should also feel more concerned about the disbursements. The less public money is expended wastefully the less will be the necessity of guarding against unjust and excessive taxation.

CONDITIONS INDICATED BY BRILL REPORT

The annual report of The J. G. Brill Company is a pretty good barometer of the business aspects of the electric railway industry. It has the advantage of being issued by a company the greater part of whose products are used by electric railways, whereas the business of the large electrical manufacturing companies is affected by many factors outside of the electric railway field. The Brill report was published last week in our department "Manufactures and Markets" and shows a number of interesting facts. One of these was that the sales value of the combined output of the plants of the company during 1916 was considerably larger than during either of the past two years and indeed larger than during any other year since 1907 with the exception of the two years 1912 and 1913. Part of last year's sales, however, were for munitions. On the other hand, the net profit on sales of more than $6,000,000 was only $93,257, or smaller than for a number of years past. This was due to three causes. One was that a number of orders were carried over from the previous year at low prices. Another was the severity of competition, while the third reason was the high prices of material and labor, with the difficulty in getting prompt deliveries. This statement shows that this company, and the same condition probably applies to others, did not find the high prices of last year conducive to large profits and that the railways must reconcile themselves, for some time at least, to paying more for their cars and other equipment. While the competition mentioned in the Brill report will probably keep the profits in such sales to a reasonable amount, there is no reason to expect that the added cost of manufacture will be borne by anyone except the consumer.

DRAINING THE TRACK

Years before electric motive power was applied to car haulage the importance of a thoroughly drained roadbed was well understood by way engineers. Judging from some recent observations, however, not all electric railway operators have profited by the ripe experience of the past. In small cities and towns it is not infrequently the case that interurban roads enter over unpaved streets and that the outlying lines of local street railway systems also traverse unimproved streets. The surface drainage on such streets, as a rule, is very inadequate. Pools of water stand on or close to the tracks, and the pumping action given the ties by passing cars soon reduces the ballast to the consistency of gruel. As gruel was never intended for a track support, rail alignment is soon destroyed, joints and bonds are broken, the cars ride roughly and occasionally derail, schedules cannot be maintained, and the people complain about the service and their run-down-at-the-heel electric railway system. In one case observed the track had been recently realigned and reballasted with a good grade of gravel ballast, but as the result of several heavy rains following each other in close succession the final state of the track was worse than the initial state. In a comparatively few hours the heavy rains and traffic had offset the labors of a large gang of track men for a week.

With the breaking up of winter and the coming of the spring rains the drainage problem is just now one of considerable moment to many roads, particularly those located in the northern part of the country. Electric railways certainly are not responsible to the public for street drainage or the lack of it, but nevertheless, because those who are responsible have either ignored or shifted the burden, the problem is one that must be faced. In many cases the judicious use of a few field tile would go a long way towards solving the problem as far as the railways are concerned, and as such drainage work is cheap in comparison with track maintenance, it would seem to be on the side of true economy to spend for drainage some of the money now spent for track maintenance.

AN IMPORTANT INTERURBAN PROJECT WELL UNDER WAY

In view of the present state of suspended animation in the field of electric railway construction it is refreshing to follow the progress of the $3,500,000 development which will soon furnish high-speed and frequent service between Buffalo and Niagara Falls, N. Y. An electric line belonging to the International Railway already connects these cities and gives through service, but so much of the road is in city streets, involving many stops and sharp turns, that serious competition with the steam railroads has been out of the question. The new line, which is also to be built by the International Railway, is largely on private right-of-way, and the equipment has been selected with a view to making the most of this fact. Unfortunately the line will be obliged to use the city streets at both ends, but in the Tonawandas, located about midway between terminals, a cut-off has been provided, and numerous bridges will eliminate practically all grade crossings.

It is fitting that high-speed electric traction should be adequately represented at one of the show spots of our country. With electrical energy so plentiful and so cheap in this vicinity, it is the appropriate motive power for this interurban service. The International Railway has been doing everything possible with the means at hand to attract visitors to the Falls, but it has lacked an almost essential element in not having quick means for getting visitors over from Buffalo.

From the technical point of view the problems which had to be solved in this project are unusually interesting. For an interurban line it is not usually necessary to combine high accelerating power with high running speed. Obviously the two are not inherently compatible, for high speed means in general a weak motor field, whereas quick acceleration requires a strong one. The tap-field motor, however, provides both of these features, and in the present case the tap-field principle has been utilized to the full, as it can be with the aid of commutating poles. It will, therefore, be possible to accelerate at 1.5 m.p.h.p.s. and yet make a free running speed of nearly 60 m.p.h. The tapping of the fields will be done in this case by means of a tapping unit separate from the power contactors, with separate current-limit relays to provide for independent current settings with full and reduced field. The result will be increased flexibility of control.

An article on this property is of interest just now not only because of its novel electrical features, but because two larger steam lines desire to acquire the stock of the Frontier Electric Railway, on whose right-of-way in part the new road is located, for the purpose of building an electric freight line. The project is under investigation by the Public Service Commission for the Second District, to determine whether or not an additional freight line is needed. If the desired permission is granted the Frontier Electric Railway will become one of the most important short electric lines in the country. The high-speed passenger line is not affected by this project, however, and is being pushed to completion rapidly.

TO-DAY'S STATUS OF THE SMALL WHEEL

An account of the new type of car for St. Paul and Minneapolis, which was published in last week's issue, had a special element of interest in that it displayed the conservative Twin City Rapid Transit Company as adopting the small wheel for new equipment. This makes it timely to review the status of this very important development in city car design.

With the latest additions to the list there are at present eight out of fifty-six cities of more than 100,000 population which make use of wheels 26 in. or less in diameter on regular equipment. Of these, Pittsburgh, Cleveland and San Francisco are the most important. The first-named has used 24-in. wheels since 1912 and the two last-named have used 26-in. and 24-in. wheels respectively for about three years past. In no case has any appreciable difficulty been experienced, and in this connection special emphasis should be laid upon the absence of trouble from small clearances at the center and ends of the car body during the passage of vertical curves, for which both Pittsburgh and San Francisco are notorious. The same satisfactory features seem to apply universally in the case of the other large cities where small wheels have been introduced, as well as to the very considerable number of towns whose lesser population does not warrant their being singled out, and in no case with which we are acquainted has any company, after trying out the new type of equipment, returned to the old-style large-diameter wheel.

The record of the small wheel may, therefore, be said to be perfect, and it is pertinent to consider the reasons why its popularity has not grown more rapidly—since introduction on 12 per cent of the country's large city systems in the course of five years is by no means extraordinary for such an obviously valuable feature. The condition seems to have been largely due to an early distrust of the small-dimension motors necessary to provide clearance over the paving. When the low-floor motor was first developed it looked like a violation of all laws of nature and trigonometry, and a great deal of criticism was in evidence on the grounds that it must have been "skimped" in manufacture. There was also a tendency to lay stress upon the economy in maintenance of two-motor equipments, and since the first of the low-floor motors was a little too small to handle the weights of the then-existing cars on maximum traction trucks, it was argued that extra maintenance would be involved if four small motors were installed per car when two slightly larger ones would do the work.

Neither of these objections was borne out in fact, although they may have been conceived on sound theory, because the apparent skimping of the small motors was really due to the use of commutating poles and ventilation for the first time on 30-hp. equipments, and the extra cost of maintaining a four-motor equipment, say, $20 or $30 per annum with modern motors, becomes insignificant when compared to the savings in power effected by the light motors and small wheels. Nevertheless these objections and other less logical ones, such as the cost of carrying two sizes of wheels in stock, kept the small wheel from receiving general consideration for fully three years after it was first brought into use, and so far as its actual commercial development goes, one may say properly that it is not yet two years old. Under these circumstances its growth has, in reality, been at a rapid rate, and within another half-decade it will undoubtedly be found on the major number of all new cars that are built for city service.

RAPID-TRANSIT PLAN FOR SYDNEY

The proposed rapid transit plan for Sydney, the leading seaport of Australia, which is described in outline on another page of this issue, has met a traffic situation which offers in many respects a small-scale parallel to that of New York City. The business district of Sydney is located on a 2-mile-long peninsula; and because of its topographical limits it is extraordinarily congested. Rush-hour traffic to the residence districts has already reached the limit of the existing surface railway facilities, and even the steam railroad system that handles suburban traffic is nearing the end of its rope. Consequently the necessity for a loop subway under the business district with high-speed lines on the surface branching off to outlying suburbs is almost obvious.

Two features of the plan, however, are distinctly novel—if one excludes the use of bridges instead of subways across the estuaries bounding the city. The first of these is the electrification of the suburban steam railroads now reaching the city and their operation in conjunction with the subway underneath the business district. Suburban trains, therefore, will not be turned at the steam railroad terminal station but will be routed into the subway, around the loop and out into the country again. The primary requisite of this plan is, obviously, that the subway tube must be large enough to take full-sized rolling stock, and this of course means a large construction expense. On the other hand there comes an indirect saving through more rapid movement of cars that may go far to offset the added first cost, and there is also much greater convenience for passengers, who are thus relieved of the customary change of cars from rapid transit service to suburban lines.

The second feature of note is the proposed use of reservoir stations having bifurcated tracks so that alternate trains make their stops on opposite sides of an island platform. The result can be secured obviously either by a track switch which shunts the individual trains first on one side and then on the other or by the use of gauntleted tracks. This plan, which largely doubles the capacity of each track, is not new in theory. It was suggested in 1908 when the construction of the new subways in New York was under consideration but was not adopted, presumably because of complications feared from a transportation standpoint. In consequence, the results attained with it in Sydney should be particularly interesting, when they are available.

Buffalo-Niagara Falls High-Speed Line

Quick Acceleration, High Running Speed and Frequent Service Are to Be Characteristics of New Line on Private Right-of-Way Now Under Construction Between These Two Cities

THE officials of the International Railway, Buffalo, N. Y., hope before the end of the present year to be able to open the high-speed line between Buffalo and Niagara Falls. As shown by the table below, the proposed schedule calls for exactly one hour between termini in the heart of the two cities, a distance of 23 miles. This time allows for eighteen stops and fifty slow-downs, and requires a free running speed of nearly 60 m.p.h.

	Distances and Schedules			
	Miles	Stops	Slow-downs	Time, All, Minutes
Court Street to Main and Erie (Buffalo)	4.9	9	43	25
Main and Erie to Portage Road and Buffalo Avenue (Niagara Falls)	16.64	6	0	27
Buffalo Avenue and Portage Road (Niagara Falls) to Terminal Station (Niagara Falls)	1.43	3	7	8
Totals	22.97	18	50	60

This project involves the construction of a double-track line on the right-of-way of the Frontier Electric Railway, which the International Railway purchased somewhat more than a year ago. It consists of a 66-ft. strip located as indicated in the accompanying map. This parallels one of the existing steam roads for a part of the route, with a detour at North Tonawanda. The double-track line will run from Main and Erie Railroad in Buffalo to Portage Road, Niagara Falls, and will connect with the present tracks in these two cities. All street crossings in Tonawanda will be eliminated and nearly all in North Tonawanda. The maximum grade will be 0.7 per cent, and this grade will be about 3000 ft. long. The construction is now considerably more than one-half completed.

Data on Car for International Railway High-Speed Line

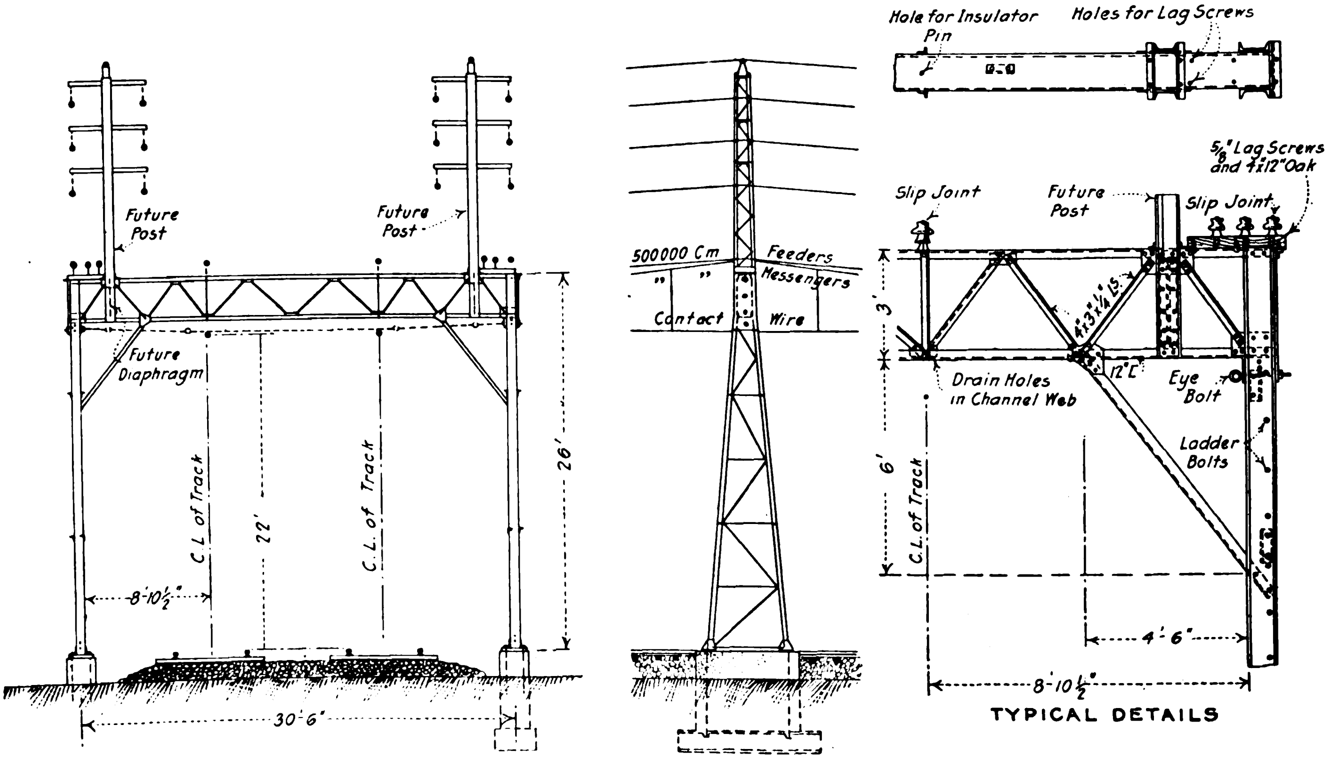
Seating capacity	63

WEIGHTS

Body	27,000 lb.
Trucks	19,000 lb.
Air brakes and auxiliaries	1100 lb.
Motors and control	10,670 lb.
Total	57,770 lb.

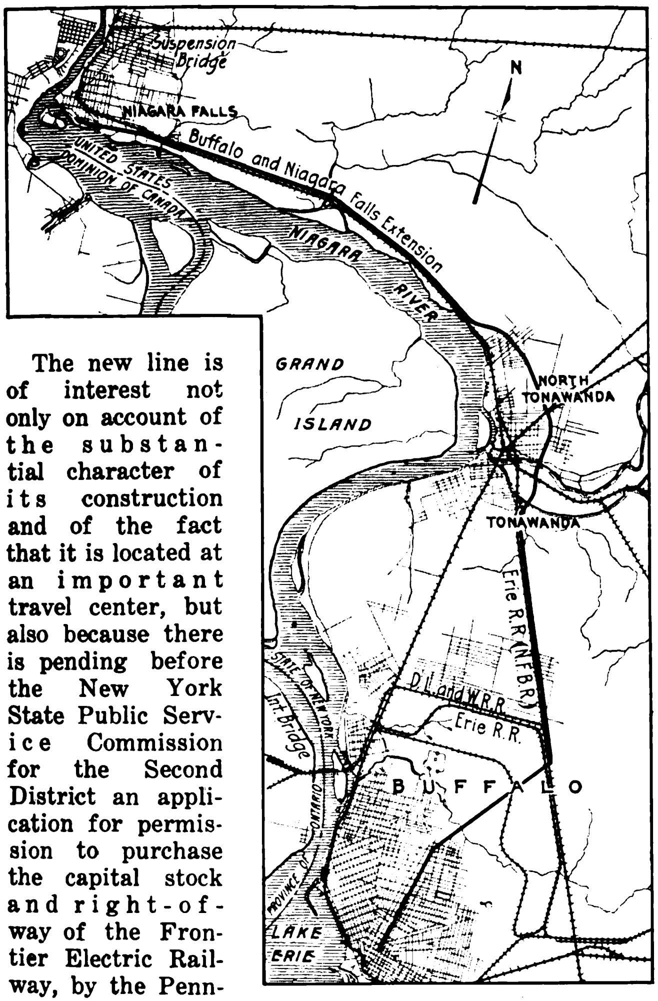
GENERAL DIMENSIONS

Over-all length	54 ft. 7¼ in.
Truck centers	32 ft.
Width over side posts	8 ft. 6 in.
Height rails to underside of sill	2 ft. 10⅞ in.
High rails to copper floor	3 ft. 4⅜ in.
Height rails over trolley board	12 ft. 3 in.
Height rails to first step	13⅜ in.
Width of center door opening	3 ft. 11 in.
Height car floor to ramp of car	10 in.
Ramp from bolster to wall	6 in.
Width of aisle between seats	27 in.
Width of rubber tiling in aisle	24 in.
Length of seats	31 in.
Height of seat backs	19½ in.
Center to center of seats	31½ in.


Future Post
Future Post
Future Diaphragm
C.L. of Track
22'
C.L. of Track
26'
8'-10½"
30'-6"
500000 Cm
Feeders
Messengers
Contact
Wire
Hole for Insulator Pin
Holes for Lag Screws
5/8" Lag Screws and 4x12" Oak
Slip Joint
Future Post
Slip Joint
3'
4x3x¼ Ls.
12" C
Drain Holes in Channel Web
Eye Bolt
Ladder Bolts
6'
C.L. of Track
4'-6"
8'-10½"

TYPICAL DETAILS

BUFFALO-NIAGARA FALLS HIGH-SPEED LINE—DIAGRAM OF OVERHEAD BRIDGE STRUCTURE, WITH DETAILS OF CORNER BRACING AND POSSIBLE FUTURE TRANSMISSION LINE POST



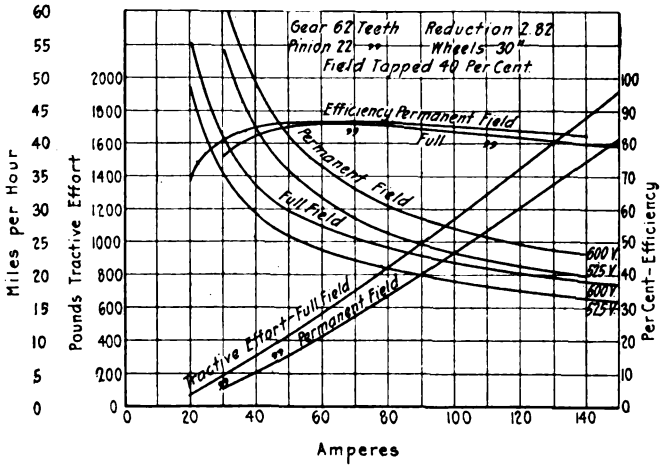
MAP OF REGION, SHOWING NEW LINE AND STEAM RAILROADS

The new line is of interest not only on account of the substantial character of its construction and of the fact that it is located at an important travel center, but also because there is pending before the New York State Public Service Commission for the Second District an application for permission to purchase the capital stock and right-of-way of the Frontier Electric Railway, by the Pennsylvania Railroad and the Delaware, Lackawanna & Western Railroad. These roads propose to build a line contiguous to the high-speed line of the International Railway, this line also to be electrically operated.

WAY AND STRUCTURES ON NEW LINE

Between the two terminal cities the line will cross only two improved streets at grade, these being in North Tonawanda. The elevation of the roadbed through the Tonawandas involves a fill from 16 ft. to 24 ft. high, 2½ miles long. In making this fill, which was practically completed last season, it was necessary to move 600,000 cu. yd. of earth from a cut and embankment at the north end.

At street crossings plate-girder bridges with concrete abutments will be used, the designs being such that very heavy traffic can be carried. Along the line there are also to be four truss bridges, a Scherzer lift bridge over Tonawanda Creek, and several plate-girder bridges in addition to those used for street crossings. Besides Tonawanda Creek the road crosses the New York Central tracks, Mill Creek, Ellicott Street, State Ditch, Cayuga Creek, Gill Creek and the Gratwick Trestle. The work on the bridges, the masonry work and the grading are being done by contract. The American Bridge Company is building the track bridges as well as the catenary bridges for the overhead structure, mentioned below.



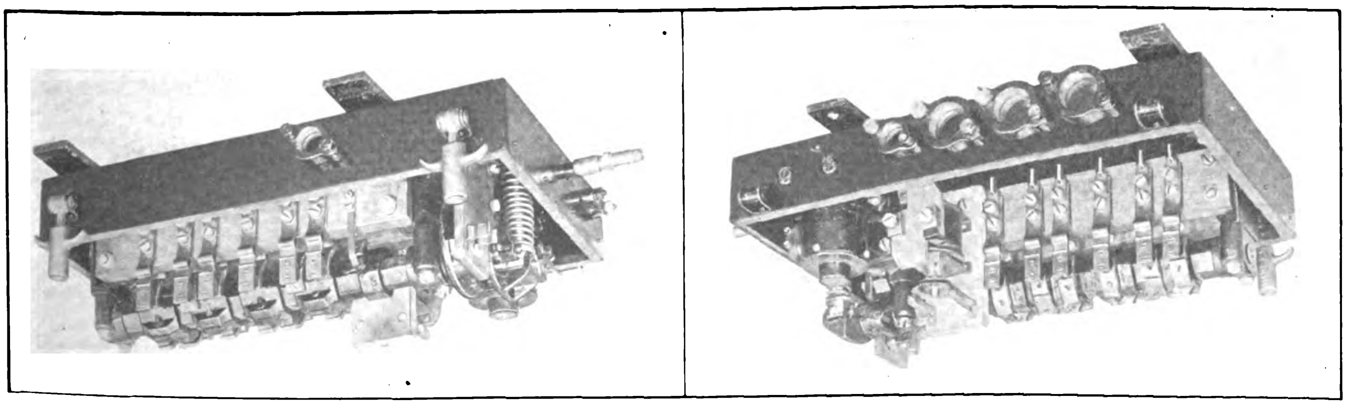
BUFFALO-NIAGARA FALLS HIGH-SPEED LINE—CHARACTERISTIC CURVES OF MOTORS

In the track construction broken stone ballast is to be used, with standard A. S. C. E. 85-lb. rail laid on untreated white oak sawed ties. The joints will be of the Abbot type, made by the Lackawanna Steel Company, and the joints are to be bonded with the Ohio Brass Company's compressed-terminal bonds.

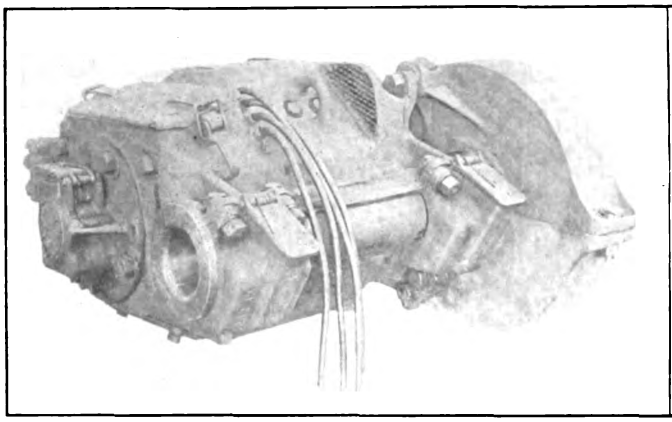
CATENARY OVERHEAD TO BE USED

The overhead construction will be of the standard catenary type with steel towers and bridges spaced 200 ft. apart. The No. 0000 grooved hard-drawn copper contact wire will be suspended 22 ft. above the rail with a hanger spacing of 10 ft. For the hangers a special clip has been designed, the details of which are shown in an accompanying half-tone. At the towers 5/16-in. steel span wires are to be installed to hold the contact wire against swaying, two insulators in series being placed on each side to insulate it from ground.

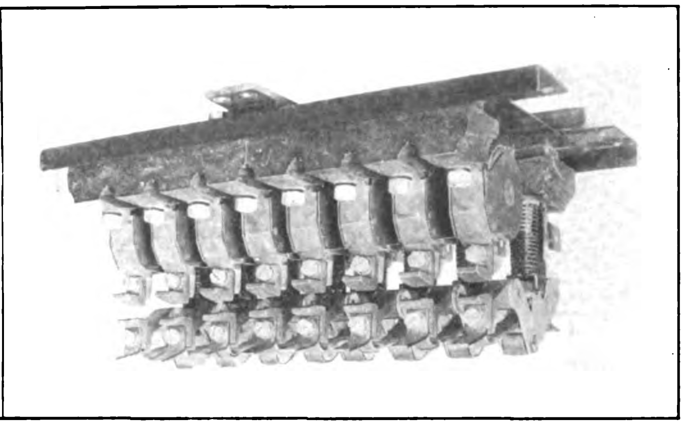
In the overhead construction 1,025,000 lb. of copper will be employed. This includes the weight of a 500,000-circ. mil messenger cable, and two 500,000-circ. mil feed wires as well as the contact wire.



BUFFALO-NIAGARA FALLS HIGH-SPEED LINE—TWO VIEWS OF FIELD-TAPPING UNIT WITH COVER REMOVED, IN INVERTED POSITION AS MOUNTED UNDER CAR



BUFFALO-NIAGARA FALLS HIGH-SPEED LINE—VIEW OF MOTOR SHOWING SCREENED VENTILATING OPENING



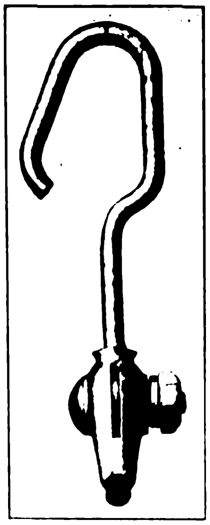
BUFFALO-NIAGARA FALLS HIGH-SPEED LINE—CONTACTOR UNITS OF CONTROLLER

On the bridges insulators standard with this company are to be used. Details of these are shown in the accompanying drawing. For dead-ending on bridge trusses lignum vitæ spools will furnish the necessary insulation, while the regular bridge insulators contain porcelain spools.

Power Supply

The contact line voltage is to be 600 and the high-tension transmission voltage 11,000, although provision is made at the substations for doubling this if necessary. The power supply is from the Niagara Falls Power Company and the railway company's power plant in Buffalo. The latter is now being enlarged by the addition of a 5000-kw. steam turbine.

A new substation will be built in Niagara Falls and will contain two 1000-kw. and four 400-kw. General Electric rotary converters. These will have a capacity rating of 50 per cent overload for two hours and 200 per cent momentary overload. They will be provided with the necessary auxiliaries, including three-phase oil-cooled transformers, with primaries wound for 22,000 and 11,000 volts, and secondaries wound for 430 volts. At the Tonawanda substation, located midway between Buffalo and Niagara Falls, three present 400-kw. rotaries will be replaced with three 1000-kw. rotaries similar to the above. The Fillmore Avenue substation at Buffalo has also been re-equipped so that there are now three 1000-kw., one 400-kw. and one 2000-kw. rotaries in place.



CATENARY HANGER AND CONTACT WIRE CLIP

Connecting the new line with the substations there will be two 1,000,000-circ. mil feeders from Buffalo, four of the same size from Tonawanda and two of the same size from Niagara Falls. From the substations to the line the feeders will be carried underground.

In its application to the commission for permission to build this line, the International Railway estimated the following as the costs of construction: Right-of-way and real estate, $850,000; bridges and culverts, $514,060; buildings, including one substation, three stations, two waiting rooms and one shelter house, $122,900; track, line, grading, and contingencies, $1,800,000, and substation equipment, $110,500. An allowance of $160,000 was also made for the sixteen cars described later, making a total estimated expenditure of somewhat more than $3,500,000.

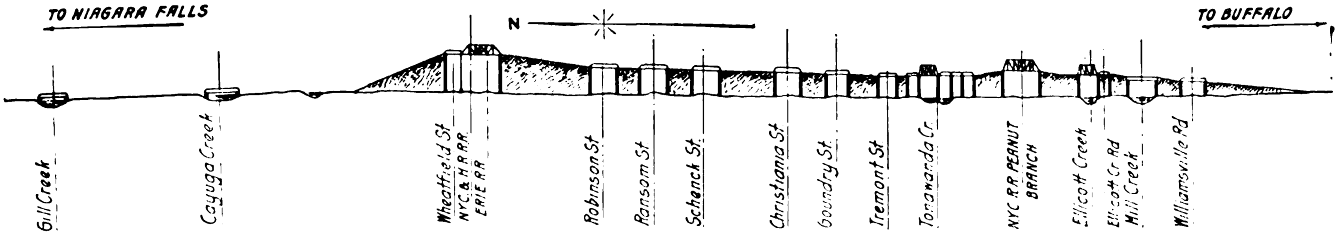
Rolling Stock

A tabular statement of the details of equipment of the cars for the high-speed line was given in the issue of the Electric Railway Journal for Jan. 6, 1917, page 61. Some of the more important dimensions and weights are given in the table on page 378.

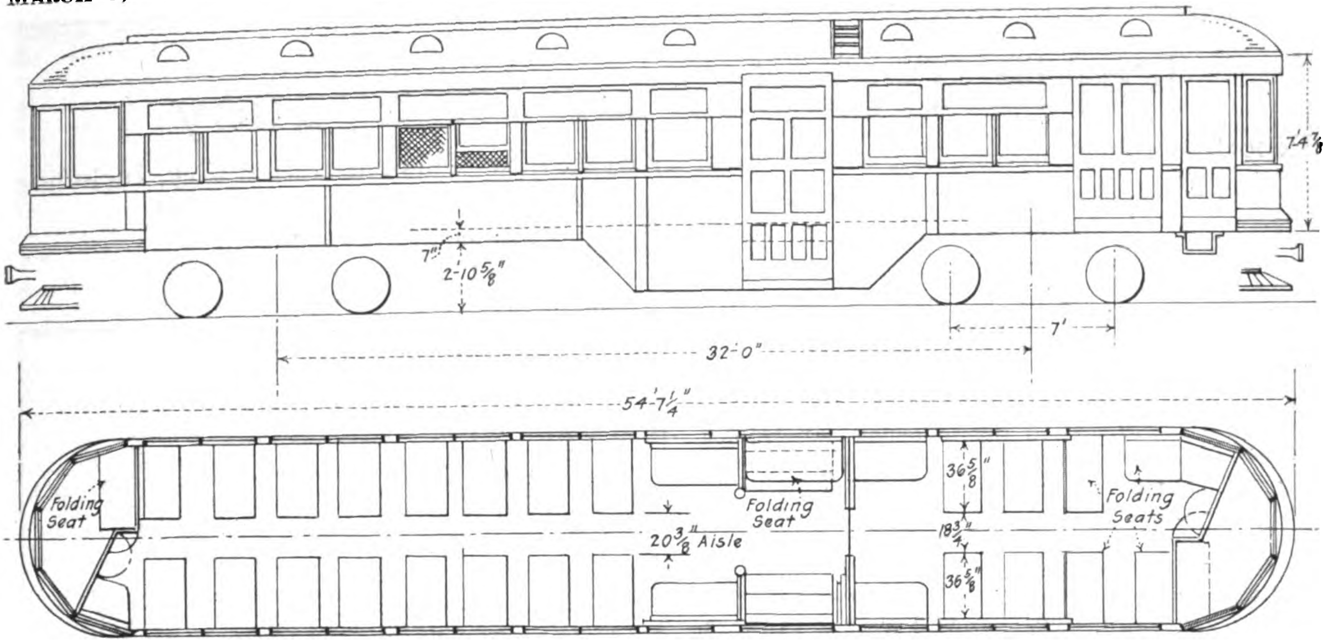
The cars are to be of semi-steel construction, equipped for double-end operation. The center-entrance type was selected in order to secure quick loading and unloading. The bodies will be divided into three sections, one for baggage, one for smokers and one for non-smokers. They will be arranged for the possible later installation of toilet rooms which may be located either near the center entrance or in a corner of the baggage compartment.

The bodies will have steel underframes, side, corner and vestibule posts, carlines and top plates. The inside trim and partitions will be of mahogany and the head-lining of Nevasplit. Under the seats, all of which excepting those near the entrance-exit are to be of the cross type, the floor will be double with 13/16-in. yellow pine top and 13/16-in. maple bottom. In the aisle the top will be of 5/16-in. interlocked rubber tiling, 24 in. wide, which will run the full length through the center of the car from the baggage compartment to the motorman's compartment at the opposite end.

Without going into superfluous detail, the following items may prove of interest in visualizing this car: The roof of the car will be of the arch type with detachable



BUFFALO-NIAGARA FALLS HIGH-SPEED LINE—LONGITUDINAL SECTION OF FILL AND APPROACH, WITH BRIDGES, NOT TO SCALE

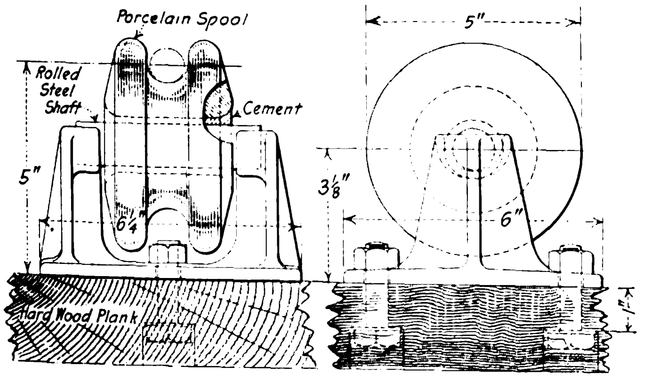


BUFFALO-NIAGARA FALLS HIGH-SPEED LINE—PLAN AND ELEVATION OF CAR

hoods. The underframe will be continuous under the platforms, and Hedley anti-climbers will form the bumpers. Three entrance steps are to be provided with ends inclosed, and there will be two-rung ladders immediately below the motorman's exit doors. On the roof will be copper gutters over the door openings, and two trolley boards will run the full length of the body supported on oak brackets over each steel carline.

Motors and Control

The motor equipments for the new cars will consist each of four GE-203-P, ventilated, commutating-pole motors, having a normal one-hour rating of 50 hp. at 600 volts. The gear ratio used is to be 62:22, equivalent to 2.82. The control will be of the standard PC-5 type, cam-operated, by means of which the individual contactors are actuated by a camshaft and, therefore, open and close in a definite sequence. A current-limit relay, which is located in the control box, can be so adjusted that the control circuits are completed at proper intervals to maintain the necessary motor current to secure uniform acceleration of the car.



BUFFALO-NIAGARA FALLS HIGH-SPEED LINE—INSULATOR FOR USE ON BRIDGES

Maximum speeds are to be obtained by tapping the motor fields in the full multiple connection. The apparatus to be used for tapping the fields is entirely distinct from the main control and consists of a field-tapping unit, including an air-operated cylinder and a current-limit relay mounted in a metal containing box. This unit is shown in two accompanying reproductions from photographs. The cylinder is held in the "off" or full-field position by a substantial coil spring. The admission of air to the operating cylinder is effected by a small magnet valve energized from the control circuit. Upon the admission of air, the spring is compressed and the cylinder moved to the "on" or tapped-field position. Upon the failure of either the control current or the air pressure the connections are returned to the full-field position.

In order that the motors may be tapped at an opportune time the control circuit which actuates the air valve is completed on the full parallel position of the motor controller, after the motor current in the field-tapping relay coil has dropped to a predetermined value. As the field-tapping switch includes a separate current-limit relay, this allows the motors to be operated at a different current setting from that used in the full-field position. Either the current-limit relay in the motor controller or the relay in the field tapper may be adjusted to any current values within reasonable range, and will thus automatically control the acceleration of the equipment. The normal adjustment is designed for an acceleration of 1.5 m.p.h.p.s.

The gear ratio of 2.82 with these motors provides for a free running speed of nearly 60 m.p.h., at the same time allowing the use of the high rate of acceleration by the use of 40 per cent of field tapping. High running speed and quick acceleration were necessary to provide the required high-speed service, in view of the number of stops and slow-downs called for by the schedule.

Other Details of the Car

For illumination there will be a circuit of six 94-watt lamps, one in the baggage compartment, two in the smoker, and three in the main compartment. Five will be in series with a selector switch to insure that this number will be burning at any one time. There will also be an 8-lamp circuit of 36-watt lamps arranged so that five will be burning at any one time. The electric heaters will be of the truss-plank type. An electro-pneumatic air signal will be installed in the motorman's cab. The air-brake equipment is to be of the automatic type with cooling coils arranged in manifold, and includes automatic slack adjusters.

Rapid-Transit Plan for Sydney

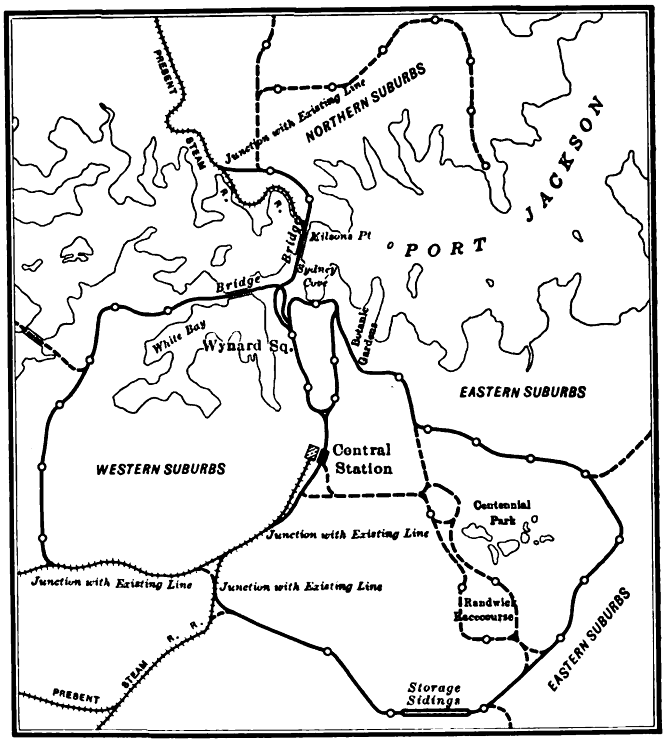
A Report on the Projected High-Speed Railway System for This Australian City, Including Electrification of Suburban Steam Railroad Service, Has Been Prepared by the Department of Public Works of New South Wales and an Abstract Is Published

A REPORT on the projected rapid-transit system for the city of Sydney, New South Wales, Australia, has been prepared by the Department of Public Works, and its salient points have been abstracted and rearranged in the following paragraphs. The work recommended in this report includes the following items, which are to be undertaken in the order shown: The electrification of the inner-zone suburban service for a distance of approximately 15 miles on the steam railroads radiating from the city; the construction of an underground rapid-transit loop serving the city's business district together with electric railways in tunnel, on viaduct and on the surface in private right-of-way that will give high-speed service to the eastern, western and northern suburbs; the construction of two long-span cantilever bridges across arms of the harbor lying to the north and west of the business district of the city; the electrification of the outer zone suburban railways for a radius approximating 40 miles from the city, and the construction of an underground loop line for tram cars to reduce the congestion at the street surface within the business district. The ultimate cost of all this work will amount approximately to $100,000,000 exclusive of real-estate payments.

At the present time the work in hand, which is to be completed in 1919, includes the construction of the underground rapid transit loop, which is called the City Railway, and about half of each of the railways to the eastern and western suburbs, as well as the provision of additional power to the extent of 45,000 kw. in the present power station at White Bay, the estimated cost of this part of the work being $32,000,000. The authorizing act provides also for the electrification of certain of the inner-zone suburban traffic on the steam railroads, together with the installation of the necessary power and rolling stock, thus involving a further expenditure of some $18,000,000, making up in all about half of the estimated cost of the whole project. The method of procedure provides for the immediate electrification of 15 miles of one of the steam railroad lines so that this can be worked electrically to familiarize the department officials with electric operation for a year or more prior to the introduction of complete electrification.

EXISTING TRAFFIC CONDITIONS IN SYDNEY

The passenger traffic of the metropolitan area of the city of Sydney, which ranks as the fourteenth seaport of the world, based on inward-bound shipping, is at present carried on in part by steam railroads terminating at Central Station on the south side and at Milson's Point across the bay to the north of the city, whose business district is in the form of a peninsular that runs due north and south for about 2 miles and is bounded by a harbor to the west and by a large park to the east. Steam ferries convey passengers not only to the suburbs on the northern side of the bay but also to other points along the estuary extending for many miles east of the city. The traffic of suburbs that are not served at present by these steam railroads or ferries is carried by electric tramways. The tramways are required also to convey the railway and ferry traffic through the congested business district of the city.



SYDNEY RAPID TRANSIT—PLAN OF CITY AND IMMEDIATELY-ADJACENT SUBURBS SERVED BY NEW SYSTEM

During the past four years traffic on the tramways has increased at the rate of about 12 per cent per annum and has now reached the saturation point. It is almost impossible to accommodate more cars on some routes during the evening rush hour. The combined steam-railroad, ferry and tramway traffic in the metropolitan area during the year 1914 amounted to 394,000,000 passengers, a daily average of 1,163,000. Of these the suburban steam railroads handled 73,000,000; the ferry steamers 35,000,000, and the tramways 286,000,000.

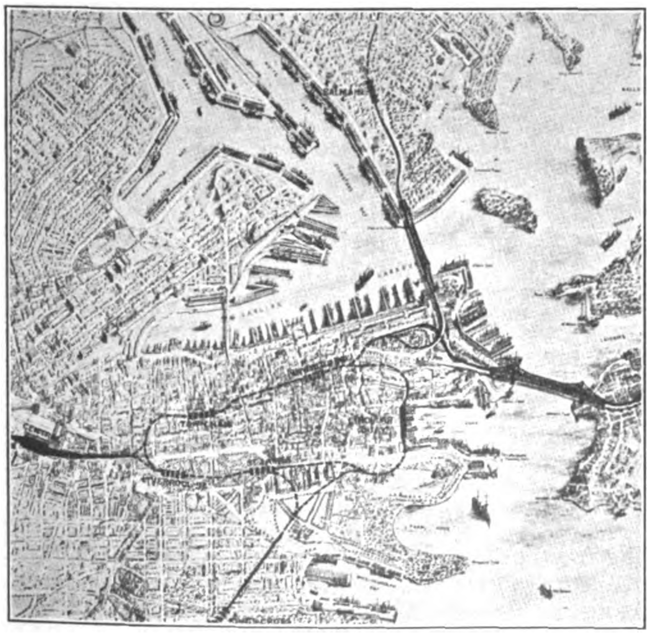
On the steam railroads terminating in the city of Sydney the suburban operations greatly exceed those train movements classified as through service. Special loop lines for freight are now under construction, and soon all freight traffic will be practically dissociated from the inner-zone suburban passenger traffic. Even so, the traffic at Central Station is extremely congested, since about 312 trains depart and the same number arrive daily, in addition to about sixty empty passenger trains in each direction. The peak load at the station occurs between 5 p. m. and 6 p. m., the average for the hour being about ninety-six trains. At Milson's Point the traffic is relatively light, approximately fifty trains arriving and fifty departing each day.

DETAILS OF PROPOSED RAPID-TRANSIT PLAN

As shown in the accompanying diagram, the new rapid transit plan includes a two-track subway loop extending completely around the business district of the city. From this a two-track loop line branches off to serve the western suburbs and another to the eastern suburbs, while a two-track line runs to the north and joins the steam railroad now terminating at Milson's Point. The two lines that branch off to the north and west cross the harbor on bridges 170 ft. above high-water level, and all three of the exterior lines, after branching off from the subway loop, are run generally in the open air, making use of viaducts, embankments, open and covered cuts and tunnels according to topographical features of the private right-of-way. Extensions will be required at a later date, as shown by the dotted lines on the map, and in addition a double-track underground tramway will have to be installed in the business district to remove some of the traffic from the surface. This underground tramway will form a loop inside of the City Railway, but at the south end it will branch off to east and west for about 1 mile before coming above ground and connecting with the existing surface tramway system.

The unusual procedure of adopting underground tramways has been recommended, not so much as a means for satisfactorily relieving the dense passenger traffic, but rather as a means for facilitating the vehicular and pedestrian traffic by the removal of the tram cars from the streets in the business district. The cost of the underground tramway can be justified for this latter purpose, but not for the former, since the volume of traffic that could be taken by the two-car tramway units is small compared with what could be taken by electric railway trains.

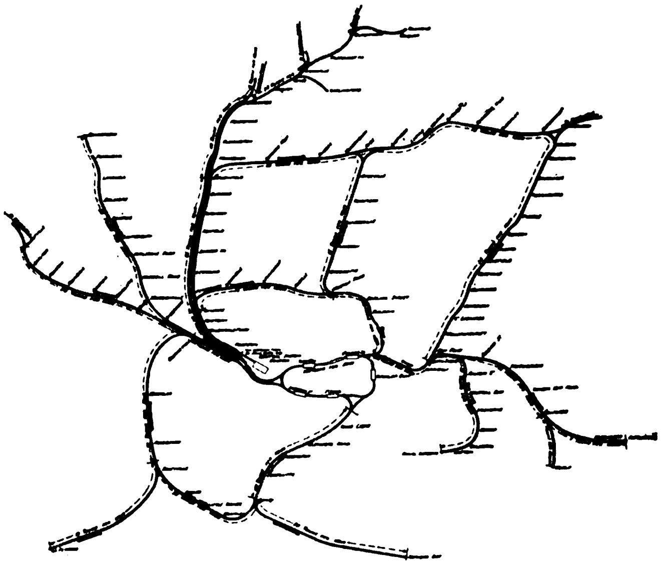
Thus in the city proper the railways and tramways will be wholly underground, while the railways of the northern, eastern and western suburbs will be on private right-of-way and will not obstruct the streets or be any detriment to the adjoining property. The railway stations have been so located that the outlying tramways will act as feeders, and it is planned that passengers can obtain daily or season tickets to cover both railway and tramway journeys.



SYDNEY RAPID TRANSIT—BIRD'S-EYE VIEW, SHOWING PROPOSED SUBWAY LOOP IN BUSINESS DISTRICT

By the unification of operations for both tramways and rapid-transit trains it is planned not only to reduce the total cost of each passenger journey by an appreciable amount, but in addition to cut the time of the journey very materially in many cases by more than 50 per cent.

The present steam-railroad suburban service to and from the city is, as before mentioned, to be electrified as part of the general plan. By this means the train capacity of Central Station should be increased by 60 per cent, and by providing suitable rolling stock the passenger capacity of trains could be increased 100 per cent, making a total increase in capacity for Central Station of 220 per cent and enabling 78,000 passengers to be dealt with during the rush hour instead of 24,500 as at present. When it is electrified this suburban service will not terminate at Central Station, but will be routed over the City Railway through the subway around the business district of the city. In consequence, a four-track line branches off from the existing railroad system at a point about ½ mile south of the terminal at Central Station and runs northward approximately parallel to the railroad tracks to the eastern side of the present building, where an eight-platform open-air station will be provided. The through traffic will be handled from stub end tracks, as at present, but the four-track electrified line will continue northward through the station and will join the subway loop of the City Railway at its southerly end.



SYDNEY RAPID TRANSIT—GENERAL PLAN OF COMPLETED SYSTEM

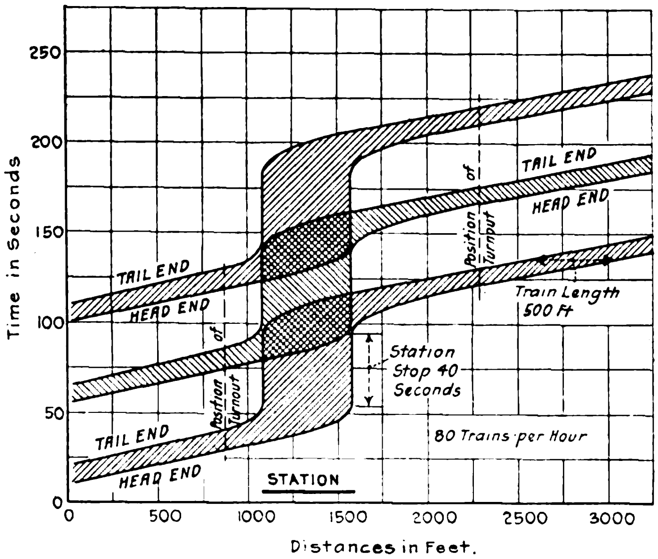
OPERATING PLAN FOR NEW SYSTEM

The City Railway loop will have five stations, of which one, Wynyard Square, is especially important and will have two levels. On the lower level the City Railway trains will be accommodated, while the suburban trains from the northern suburbs that pass across the high-level bridge at Milson's Point will be served by the upper platforms. Some of the latter trains will connect also with the City Railway loop at a point south of Wynyard Square so that they may serve the Central Station and stations on the subway loop.

North of Wynyard Square station the subway is changed to overhead construction for a short distance to serve the ferry terminal in Sydney Cove at the northern end of the city and to provide approaches for the line that will cross the bridge to serve the northern suburbs. In addition there is a branch from the subway leading up to the approaches of the other high-level bridge, which serves the western suburbs. On the eastern side of the City Railway loop another line branches off to the eastern suburbs, coming above ground about ½ mile away. The main loop is approximately 1 mile from end to end and about ½ mile across. About 16 miles of track, of which half is above ground, are included.

On the City Railway the stations provide for island platforms 520 ft. long. Bifurcation of track at the platforms has been adopted to eliminate the effect of the station stop on track capacity, while congestion is avoided by separating the incoming and outgoing traffic as it moves from the platform to the street and vice versa. A maximum speed of 35 m.p.h. will obtain on straight level track and down grades, and the schedule speed, including station stops, will be half the maximum speed, or 18 m.p.h.

With regard to the use of bifurcated tracks, the report states that the capacity of a rapid-transit railway is measured by the number of trains that can traverse a single track during the evening rush-hour. The number of trains depends primarily upon the length of station stops, and if the effect of the stop can be eliminated the capacity is increased. This can be done by bifurcating the tracks at each station and providing for alternate trains to stop at opposite sides of an island platform. The capacity of the line is then governed practically by the minimum possible headway between trains on a single track. At Wynyard Square Station, where it is estimated the station stop will be forty seconds in duration, there will be handled by far the greatest part of the traffic on the City Railway, and the length of stop at this point will determine the train capacity of the whole railway, the stops at the other stations being estimated at only fifteen or twenty-five seconds.



SYDNEY RAPID TRANSIT—DISTANCE-TIME CURVES, SHOWING EFFECT OF BIFURCATED TRACKS AT STATIONS

The accompanying distance-time curves display the effect of the bifurcated track. In these the length of station stop has been taken at forty seconds. The average acceleration has been taken at 1¼ m.p.h.p.s., the maximum speed 35 m.p.h., and the average rate of braking 1¾ m.p.h.p.s. Operating under these conditions the capacity of a single track not bifurcated at platforms is, with automatic speed control, forty trains per hour and, with visual signaling, thirty-four trains per hour. With tracks bifurcated at platforms some eighty trains per hour with automatic speed control, or sixty-eight trains with visual signaling, can be operated on a single track. These figures are determined by the shortest necessary running distance between trains. This minimum distance is about 800 ft., and it must be maintained for an appreciable interval of time after one train has completed acceleration and just before the other train commences braking. The schedule, as called for in this case, requires that both trains shall maintain almost full speed during this time interval, which would be impossible without automatic speed-control brought about by combinations of contact ramps. Cab signals and automatic speed-controlled train stops would also have to be provided.

Paradoxical as it may seem, a train under this plan is approached less closely by the next train behind it than by the third train in the line. This is because the second train has passed to another track when the first train is accelerating after a stop. The minimum space between a first and a second train is 1175 ft., while that between the first and third trains is 800 ft. Bifurcation of tracks on a double track loop gives one-third greater capacity than a plain three-track loop.

Thus, the two-track loop subway, with automatic speed control, will have a maximum theoretical capacity of 160 trains per hour into the city and 160 trains per hour out of the city. With visual signaling 136 trains per hour in each direction will be possible.

With the completion of the rapid-transit plans the actual rush-hour capacity of the whole system in all directions to and from the city will be 280 trains, or 336,000 passengers, per hour, 200 of these trains passing through Wynyard Square Station. Based on the daily distribution of railway traffic that obtains in all large cities, the evening rush-hour traffic is about 15 per cent of the total daily traffic (in Sydney at the present time it is 14½ per cent), and 336,000 passenger journeys during the rush hour would, therefore, represent a total daily number of passenger journeys in both directions of 2,240,000, or a yearly number of 759,000,000 journeys, reckoning 339 days to the year. This is practically double the number of passenger journeys by railways, tramways and ferries for the city of Sydney as of date of the report. It amounts to 544 rides per head of population per annum. This is abnormally high as compared with other cities and is due to the fact that many of the passengers at present change from the trains at Central Station and from the ferries to the tramways and are thus duplicated in the returns. However, since the normal number of rides per head of population increases as the population increases, it may be assumed that the average number of rides per head of population per annum will average 500 by the time the system is worked up to capacity. According to the present growth in population this point should be reached about the year 1935 if all passengers are provided with seats during the rush hour. If allowance is made for two seated passengers to each standing passenger, the two-track loop of the City Railway should suffice until about the year 1950, and attention is called to the fact that, on the subways of the United States and Europe between 26 per cent and 33 per cent of the passengers obtain seats during the peak.

PERMANENT WAY AND EQUIPMENT

The most prominent feature in connection with the permanent way is the use of high-level bridges for crossing the estuaries to the north and west of the city. Bridges were adopted in place of subways under the harbor primarily on the grounds of cost, and the report states that foreign engineers freely expressed the opinion that a proper selection had been made in recommending a one-span bridge in preference to a subway and also in recommending the cantilever type of bridge with horizontal lower chord in preference to the somewhat cheaper design with curved lower chord. The plan of purchase for these bridges is to have alternative tenders submitted, for local manufacture and for importation, on plans and specifications that fix the essential features only and leave the details of construction and the choice of steel to the tenderers, the successful tenderer to complete the working plans to the satisfaction of the purchaser.

For electric operation the use of direct current at 1500 volts has been adopted, and the report discusses at length whether this should be supplied to trains by overhead wire, by third rail or by both. The additional cost of providing headway in the subway for overhead construction is estimated at about $1,000 per mile. In addition the overhead wiring will probably cost the same amount more than third-rail construction. However, the amount involved would not warrant the adoption of a third-rail on the City Railway because this would always be a source of danger alike to employees and to the public.

On the suburban railways the overhead construction would cost about $2,000 per mile more than third-rail construction if there were no other considerations, but the adoption of third-rail would mean that in many places the space between the existing tracks would have to be widened to provide room for the third rail and would involve heavy costs. When all things are considered, overhead construction estimated at $10,000 per mile of single track would not cost more than third-rail construction and would afford the advantage of absolute safety. In consequence, a double trolley wire of hard-drawn copper is to be used. This will be supported from a catenary messenger cable, which in turn will be supported by structural steel brackets and will be provided with double insulation.

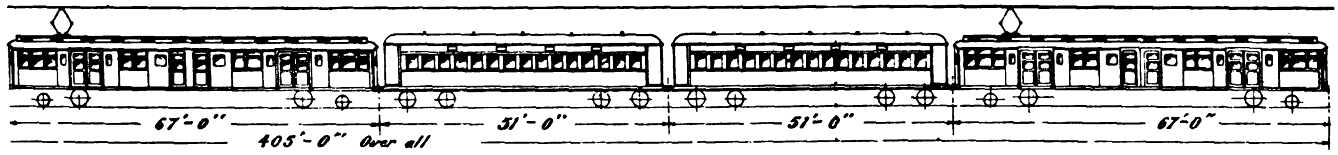
The use of direct current at 1500 volts was decided upon for several reasons, the report stating that, in the United States, several single-phase railways have been converted to high-tension direct-current railways, but in no instance has a high-voltage direct-current railway been converted to single-phase. Rolling stock equipped for single-phase is 20 per cent heavier than that equipped for direct current, and the staff required for inspection of equipment is approximately doubled. Where traffic is very heavy, as on a suburban railway, the large working expenses of single-phase systems more than counterbalance the additional first cost of the substations and transformers required for direct current, although where the traffic is less frequent and of a heavier character, as on trunk lines, the single-phase system may prove the more advantageous. However, in view of the exigencies of the immediate problem, direct current at 1500 volts is considered to be the best for the entire system.

POWER EQUIPMENT AND ROLLING STOCK

Power for the new lines is to be generated at the existing station at White Bay by units not exceeding 15,000 kw. capacity, operating at 11,000 volts, 25-cycle, three-phase, and having steam pressure at 200 lb. per square inch or more. The new units, which will have for the initial installation a total capacity of 90,000 kw., will be tied in with the existing equipment that supplies the present tramway system with power. This initial demand of 90,000 kw. will be required to give at the outset a one and one-half-minute service each way on the subway loop, a three-minute service to the eastern suburbs, a six-minute service to the western suburbs, and the present service (electrified) on the suburban zones of the steam railroads. As the initial service is increased the demand will be increased to an ultimate figure of the order of 200,000 kw.

With regard to cars for the new service the report states that the end-platform type of car now in use in the Sydney suburban service is quite unsuitable. The movement into and out of the car along the long center aisle is too congested and slow, the end doors do not afford sufficient facility for entrance and exit, and the platforms take up space which could be better used for accommodating passengers. Also, the type of car that is to be used on the Melbourne suburban railways when these are electrified has nine sliding doors on either side, and this would be detrimental to quick starting and would reduce the carrying capacity of the car. In consequence, the recommendation is for the use of an all-steel car similar in dimensions in seating capacity and door space to the equipments designed for the New York Municipal Railway. This car is cited in the report as the most desirable design in rapid-transit service to-day on grounds of efficiency, safety and economy. It has been described in several past issues of the ELECTRIC RAILWAY JOURNAL.

All new cars are to be fitted with two motors, one over each truck. It is possible that the cost of transportation and the high tariff in Australia will necessitate units consisting of a four-motor car and a trailer, which would save about $1,200 per car, but eventually, the advantages of having all cars equipped with motors are expected to outweigh the additional first cost. It is estimated that about 360 motor cars of the New York Municipal Railway type will be required at the outset to provide for the estimated railway passenger traffic and a reasonable margin for immediate growth. The existing rolling stock is to be used as trailers for these motor cars in seven-car trains, four trailers to the train, and as trailers for steam locomotives, since a steam service will have to be maintained to and from Central Station until the inner and outer zone suburban traffic is electrified. When the existing rolling stock has reached the limit of its usefulness it is to be replaced preferably by motor equipment.



SYDNEY RAPID TRANSIT—ARRANGEMENT OF FOUR CARS OF SEVEN-CAR TRAIN MADE UP WITH PROPOSED NEW TYPE OF MOTOR CARS AND EXISTING STEAM-RAILROAD CARS USED AS TRAILERS

Reduction in Accidents Effected by Door Control Mechanism

At a recent meeting of the Public Service Commission it was testified that between July and December, 1913, the Third Avenue Railway of New York reported 1457 boarding and alighting accidents in the transportation of 65,830,328 passengers. In 1915 for the same length of time between January and June, when the cars were equipped with folding doors and steps, 434 similar accidents were reported in the transportation of 66,853,831 passengers. This decrease of about 24 per cent of the total number of accidents is attributed largely to the use of doors interlocked with the control circuit.

Procedure in Chicago Elevated Valuation[*]

Author Describes the General Plan Followed by Chicago Traction & Subway Commission in Laying Basis for Unification—Interesting Details Are Given for Various Official Accounts

By F. J. BACHELDER

Consulting Engineer, and Valuation Engineer Chicago Traction & Subway Commission

THE ordinance of Jan. 31, 1916, directed the Chicago (Ill.) Traction & Subway Commission to develop a financial plan as a basis for the unification under one management of the surface and elevated lines, and, if necessary, to place a valuation upon the properties of the elevated companies. In the financial plans developed by the commission in accordance with the instructions of the ordinance, the value placed upon the elevated railroad properties is used as the figure to be added to the purchase price of the surface lines, as fixed by the 1907 ordinances, together with new capital supplied by the companies, to form a new purchase price for the entire consolidated and unified system.[†]

GENERAL PROCEDURE IN FIXING COST OF PHYSICAL PROPERTY

Reproduction cost new of the property was fixed as of June 30, 1916. To the construction cost thus obtained there were added carrying charges, interest and taxes during construction and allowances to cover the engineering, contingencies, legal, administrative, and all other preliminary expenses of the company, as later detailed. After establishing the cost new of the property, it was depreciated, according to age and physical condition, the result thus produced being its present value.

Construction Period and Unit Prices:

Three years was determined upon as a reasonable average period for the construction of the whole property. An extensive study of the market quotations on material indicated that a ten-year average was the fairest basis of price for the fluctuating items. As far as it was possible actual contract costs were used. From study of the diagrams on page 387 showing the range of copper and structural steel prices for the last twenty years, can be seen the reasonableness of choosing this average. These diagrams are representative of the market trend of other materials.

Depreciation and Scrap Value:

Depreciation in most items was determined by the straight-line method. Where the material entering into the structure had a scrap value, depreciation was only applied to the wearing value, or difference between the scrap value and the cost new.

Scrap prices of material were obtained from market quotations and ten-year averages of market prices. The cost of handling or dismantling was deducted from the scrap prices, the difference representing the net salvage value applied. In determining salvage values of structural steel, it was assumed that an acetylene torch would be used for cutting the metal apart and a locomotive crane for loading the dismantled structure into cars.

Salvage values of rolling stock were obtained by applying the ten-year average market price of the various metals obtained after dismantling the cars and deducting the cost of labor of dismantling. Actual weights of the metals obtained in each class of equipment were used. Wooden car bodies received no salvage allowance. This method resulted in the following weighted average salvage value, expressed in per cent of cost new: Wooden cars—motor, 2.6 per cent; trailers, 1.7 per cent; composite cars—motor, 3.2 per cent; trailers, 2.1 per cent; steel cars—motor and trailers, 3.6 per cent. A salvage value for power station equipment was applied at the rate of $1.50 per kilowatt on the manufacturers' rating of generating units.

Following is a table giving the ten-year average market price for scrap and salvage value of the metals involved in this valuation (cost of dismantling has been deducted in each case):

	Scrap Price	Salvage Value
Aluminum	17.13c. per lb.	16.24c. per lb.
Copper—wire	14.28c. per lb.	14.28c. per lb.
Copper—heavy cut	14.73c. per lb.	12.93c. per lb.
Lead—heavy scrap	4.29c. per lb.	4.24c. per lb.
Steel—heavy melting	$12.50 per ton	$3.75 per ton
Rail—running and third-rail	$14.50 per ton	$12.18 per ton
Frog and switch scrap	$12.50 per ton	$12.50 per ton

Life of Structure and Equipment:

The life of structures and equipment was taken to be dependent upon physical wear, decay, obsolescence and inadequacy. In addition to the life of equipment or structures whose useful life was determined by physical wear, obsolescence or inadequacy, the per cent condition of some parts of the property was determined from inspection where unusual conditions made such a method necessary, as described under special work.

Contingencies:

To cover omissions and miscellaneous construction costs where it was not possible to identify such costs in detail, 5 per cent was applied on the cost to reproduce new. Such costs were depreciated along with other costs.

Plant Development Costs:

Plant development costs were allowed where actual money was spent in perfecting the more permanent physical structures not subject to frequent renewals. This includes such items of expense as raising the structure where steam roads carried out track elevation work, including the cost of the temporary structure, where such temporary structures were necessary for keeping the road in operation, but not including the cost of structural steel or foundations. This cost was placed at a reasonable figure to cover such expense. Expenses incident to improving car equipment and other similar items were not included.

DETAILS OF VARIOUS ACCOUNTS

In addition to the foregoing remarks concerning the general procedure followed in the valuation of the elevated properties, it might be interesting to point out certain details of some items in the official classification of accounts.

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[*] Abstract of paper presented before the Wisconsin Engineering Society at Madison, Wis., on Feb. 15.

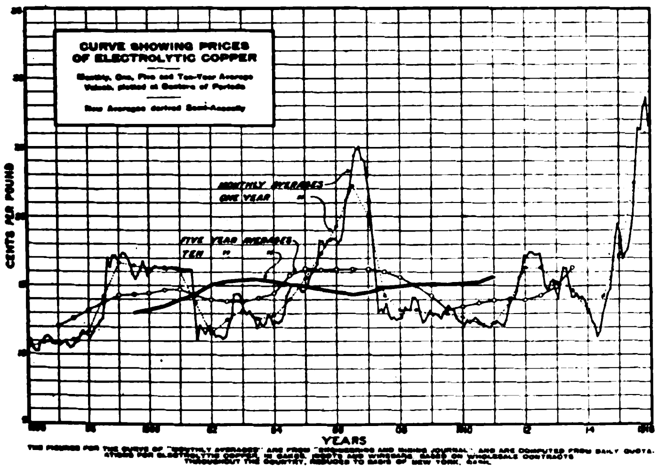
[†] The general conclusions of the Chicago Traction & Subway Commission in regard to the valuation of the elevated properties were published in the ELECTRIC RAILWAY JOURNAL of Dec. 23, page 1297.—[EDS.]

Engineering and Superintendence:

For the item of engineering the following percentages were applied: (1) Two per cent upon the value of the total rights-of-way, lands used and useful in operating the road, buildings and easements, this engineering not being considered depreciable. (2) Five per cent on the reproduction cost new of physical property other than rights-of-way, buildings and easements, plus the item of contingencies.

Right-of-Way—Acquisition Costs:

To cover costs of condemnation, surveys for titles, securing abstracts and titles, commission on real estate purchases in acquiring lands, buildings, leaseholds and special assessments for local public improvements during the construction period, an item of 10 per cent was allowed on the naked land value of all lands owned and used or useful for railroad purposes, together with buildings and excess value of leaseholds.



THE FIGURES FOR THE CURVE OF "MONTHLY AVERAGES" ARE FROM "ENGINEERING AND MINING JOURNAL", AND ARE COMPUTED FROM DAILY QUOTATIONS FOR ELECTROLYTIC COPPER, IN CAKES, INGOTS AND WIREBARS, BASED ON WHOLESALE CONTRACTS THROUGHOUT THE COUNTRY, REDUCED TO BASIS OF NEW YORK, CASH.

CHICAGO VALUATION-CURVE SHOWING TWENTY-YEAR PRICES OF ELECTROLYTIC COPPER

Rails, Rail Fastenings and Joints:

Studies were made of rail wear, both on curves and tangents, with a view of determining the life. Sections showing wear of rail for various degrees of curve and life were taken at eighty-two locations with a railograph machine, supplemented with caliper measurements. In taking these sections of running rail, showing wear, representative points were chosen; that is, sections in either the center or quarters of the rail length, avoiding points where the track was out of line. Diagrams were prepared for curved track on main line and branch line curves, and the data on wear were found to be reasonably consistent. Track fastenings were figured with the same life as the rail to which they were applied in each case.

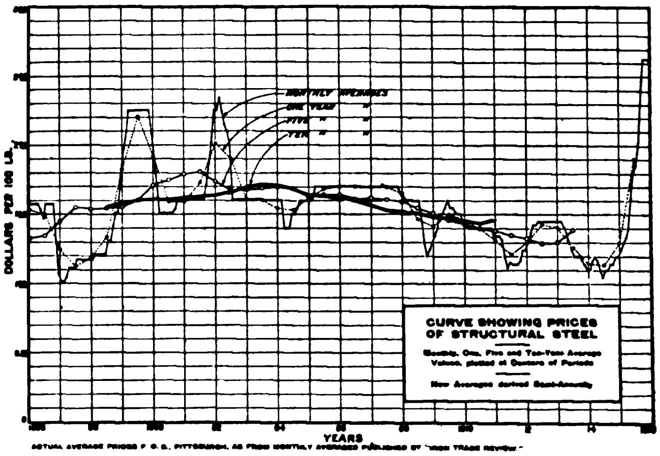
Special Work:

A condition per cent of the special work was determined from measurement and inspection, as the records of installation of these items were not complete enough and the traffic conditions varied so greatly that a uniform life could not be placed on each type of construction. Instead, information was gathered from measurements of the wear on the various items making up the special work.

The life of frogs was determined from the amount of wear on the face and points of the frog, at the same time consideration being given to the general conditions as to loose bolts, sheared or loose rivets, condition of stops and hold downs, and other parts of the frog. A wear of 0.5 in. at the point of the frog was considered the maximum allowable, and the condition taken from measurements was determined in proportion to the amount of wear in each case. The same method was used in determining the condition per cent of crossing frogs. Condition per cent of switch points was determined by the amount of wear to produce a blunt switch point, which would be unsafe to operate or keep in service on account of the danger of catching wheel flanges. Fastenings, guard rails, etc., received the same life as frogs and switches to which they were applied.

Elevated Structures and Foundations:

Structural steel of the elevated railroads was classified as follows: plate girder, incline, truss girder and truss bridge construction. Average costs per ton were determined for each type of construction, a base price being used for structural steel shapes, determined from average market prices for the ten-year period ended June 30, 1916. Following are the unit costs as placed in the valuation of structural steel as erected: Plate girder construction, $69.50 per ton; truss girder construction, $72.20 per ton; truss bridge construction, $73.50 per ton, and incline construction, $71.50 per ton. Depreciation on the elevated steel structure was based on a life of 100 years.



ACTUAL AVERAGE PRICES F. O. B., PITTSBURGH, AS FROM MONTHLY AVERAGES PUBLISHED BY "IRON TRADE REVIEW."

CHICAGO VALUATION-CURVE SHOWING TWENTY-YEAR PRICES OF STRUCTURAL STEEL

Distribution System:

Depreciation of third rail was determined entirely from the wear from contact shoes. The limit of wear was chosen as representing, in actual practice, the average to which third-rail is worn, and this formed the basis of the condition per cent as used. In order to obtain representative limit of wear, sections were taken with a railograph machine at least 300 ft. from stations, and where trains were under power. To ascertain that the graphs were really representative of the average condition of the rail, a series of caliper measurements was taken of the rail heights at intervals, the mean of which heights checked the mean of the rail graphs within one-sixty-fourth of an inch.

Depreciation of overhead trolley is almost wholly due to the wear from the trolley wheel. Condition per cent of the trolley wire was determined from actual measurements in the field, on the assumption that any trolley becomes dangerous to operation when the trolley section falls below 100,000 circ. mil. Tables were prepared to show the data obtained and the condition per cent as determined from the measurements made.

From an examination of aluminum cable actually removed from the elevated railroads this year, a life of twenty-five years was adopted for all bare aluminum cable. Contrary to general opinion, bare aluminum cable on being removed showed serious effects from the action of the elements. Studies of depreciation of bare copper cable showed that no actual physical depreciation occurred or could be measured in the case of negative and positive feeder cables. Strands of these cables were carefully measured with a micrometer caliper, and they did not show any appreciable reduction that could be thus detected in the area of the section as a result of exposure to the elements.

Passenger and Combination Cars:

This item covers all the parts and equipment of rolling stock except the motor and control equipment. Consideration was given to the type of the car and the class of materials entering into its construction, and the value obtained was the result of the detailed analysis of the cost according to the specifications for each type, fair average prices being used. A study of the physical condition of the cars was made, the study including an examination especially of wooden and composite cars. In some cases siding was stripped from the passenger cars to reveal the physical condition and decay of the sills and other parts. Furthermore, an examination of the interior finish, trucks and other parts was made. As a result the following lives of rolling stock were assigned: Wooden cars, forty years; composite cars, forty-five years, and steel cars, fifty years.

Power Plant Buildings and Equipment:

Power plant buildings were valued on a cubic-foot basis according to the character of construction. They received a life of sixty-six years, and were depreciated on this basis. Where buildings were on special foundations, the value of such foundations was added. Included in this account are the water tunnels from power plants to various sources for condensing water supply. These were estimated on the basis of the cubic yard of brick work and excavation and were depreciated on the basis of a 100-year life.

Values of power-plant equipment were obtained from manufacturers' prices and the experience of the commissioners and staff, and they included the cost of installation. Salvage values of the equipment were assigned from actual sales of similar equipment. Most of this equipment of the elevated railroads has been leased to and is operated by the Commonwealth Edison Company, which in turn furnishes the power for operating elevated trains. While these plants are not of the most modern design, they are serviceable for the peak-load operation required of them. On this account they received a life of ten additional years; that is, a total life of from twenty-five to thirty-two years.

Substation Equipment:

Values of substation equipment were obtained in the same way as those of power-plant equipment. Electrical equipment, such as rotary converters, boosters, etc., received a life of thirty-three years. Batteries had a condition of 80 per cent, which represents a fair permanent condition under their maintenance guarantee. Salvage values of the batteries were obtained by applying a ten-year average market price of the scrap metals in the battery plates, busbars, tank linings, etc.

Franchises:

No allowance was made in the valuation for the value or cost of obtaining franchises. The commissioners considered the franchise value of the elevated railroads taken as a whole, purely upon the basis of their combined earnings, as properties continuing to operate in competition with the present and future surface lines. While some of these roads, taken separately, might have a franchise value, yet, when all the roads were considered collectively as a single property, no franchise value was found and no allowance was made. This item was left for consideration by the City Council.

Interest and Taxes During Construction:

It was assumed that before the construction was started practically all of the right-of-way had been acquired, and that it was, therefore, necessary to pay interest at 6 per cent on the real estate investment for the whole three years of the construction period. This interest was applied on the total value of right-of-way and buildings. For the other physical property it was assumed that it would be necessary to pay interest on the value of the property for one-half of the construction period. Interest at the same rate was also allowed on the amount of taxes actually paid during construction.

Taxes were assumed to be paid on right-of-way and other land from the beginning of the construction period. Taxes on other physical property were assumed to be paid on one-half of the value of the property. The tax rate was determined from actual tax rates paid in Chicago for the year 1913-1914 and 1915. An average for the various city districts through which elevated railroads were constructed was found to be 18.63 mills per annum.

Miscellaneous:

This account includes expenses of a special or incidental nature prior to or during construction, such as preliminary expenses, promotion expenses, organization expenses, preliminary right-of-way expenses and insurance.

Insurance during the construction period must be paid on buildings and structures turned over to the corporation by contractors prior to the full completion of the road. To cover this cost 0.069 of 1 per cent was allowed on $46,159,555, or the reproduction cost new of other physical property plus contingencies. This expenditure was regarded as not depreciable.

After obtaining the aggregate cost of total right-of-way and other physical property, including easements, plant development costs and all incidental percentages, the commissioners concluded upon an "agreed general allowance of 11 per cent on the sum of all previous items ($73,664,666) to cover all items, which in the absence of specific information as to the actual costs thereof to the company it was not possible to determine separately in connection with the organization of the companies and the development and production of the complete operating property, such as preliminary, promotion, organization and financial expenses and working capital." This item of 11 per cent for the general allowance was depreciated at the same rate as the total property was depreciated.

Materials and Supplies:

Book inventories furnished by the elevated railroads of the materials and supplies in the storehouses and on the line of road were accepted for the purposes of this valuation. A comparison was made with book values for the last two or three years, and the total of this account checks reasonably with stocks of previous periods. It was felt that the expense of making a detailed inventory of materials and supplies was not justifiable at this time, as this should be done when final consolidation takes place. No allowance was made in this account for engineering drawings, which represent a considerable expenditure, as this cost was included under the account of engineering.

Recent Tendencies in Taxation*

Author Discusses Changes in Revenue Producing Methods—Criticizes Various National and New York State Tax Laws—Railways Should See That Money Raised Is Spent Wisely and Economically

By R. L. RAND

Vice-President Richmond Light & Railroad Company, New Brighton, N. Y.

FROM the primitive condition under which the poll or capitation tax was general, progress has been made by halting and unequal steps through various forms of property taxes, consumption and privilege taxes and latterly income and inheritance taxes. The poll tax failed because it ignored the unequal distribution of wealth brought on by conditions of advancing civilization. Substitution of the property tax, on the theory that the more property possessed the more able was the possessor to bear a portion of the public expense, was a step forward. But the unfairness of this method evidenced itself as forms of personal property multiplied, for in laying an equal burden on all property according to its value, the general property tax ignored the varying rates of income produced by different classes of property. The next expedient was the consumption tax. As a regulatory or police measure in the form of an excise on liquor or tobacco, this is successful, but as a revenue producing measure it is the most unfair of all taxes. The injustice results from the fact that it takes no measure of ability to pay. Then, too, a tax paid with open eyes is morally and economically superior to one filched in driblets. Thus one comes to the present tendency to shift taxation from things to faculty, from property to income.

PUBLIC EXPENDITURES ARE GROWING

The changes in the method of securing public revenues are the result of logical development that is only being hastened by current events. The object lesson of the great war has brought on the preparedness movement with its corresponding huge increase in expenditures for the army and navy. The Mexican situation has caused a large expenditure. The rapid assumption of new functions and duties by the government, the purchase of the Danish West Indies, and huge new public works planned and under way are introducing a new era. The country will have and continue to have taxes such as have hitherto been unknown. With many of the expenditures that are causing the increased demands, we are thoroughly in sympathy, but it is our duty to see that the money raised by the new levies is spent wisely and economically. Extravagance in public administration is encouraged by the lack of attention given it by business and business men.

UNDESIRABLE TAXATION METHODS

One of the most pronounced manifestations of the new tendency is the increasing of the rate of return on the income tax from 1 per cent to 2 per cent. In doing this Congress played politics and left the farmer secure in his practical immunity from the tax. This was indefensible class and sectional legislation. Then, too, the exemption should have been lowered before any increase in the normal rate was made. An exemption of $2,000 with an additional $500 for each dependent would not only result in increased revenue but also would work out more justly than the present flat exemptions of $3,000 and $4,000. If in addition to this change the farming element were required to bear its fair portion of the public expense, the increase of rate would have been unnecessary.

In the act of Sept. 8, 1916, Congress is experimenting with some hitherto untried sources of revenue. In one case it has been guilty to some extent of breaking its faith. I refer to the new capital stock tax. This is, in effect, as far as a profitable business is concerned, an additional tax on income, for it is income-producing ability or earning power that establishes the value of non-speculative stocks such as those of street railway companies. The real objection to the capital stock tax is that it taxes unprofitable corporate business. This is where Congress has broken its faith, for in debate on the original income tax act of 1913 Congressman Hull, who wrote the act, said: "In any event the proposed tax is measured by net profits or gains and is not imposed upon gross income or capital or other property. If a citizen has not been successful in his efforts to accumulate profits, he is not required to pay the tax." Now, however, corporations in contravention of Congressman Hull's remarks are required to pay a tax whether or not they have been successful in accumulating profits. As one authority has expressed it, "corporations are not supposed to be voters, and this may be the reason for the abandonment of principles .... expressed with so much eloquence."

One proposition for increase in federal revenues that has raised its head quite too often of late is that to tax inter-state commerce. Such a tax would be burdensome in the extreme. Railways must of necessity distribute their purchases over the country as their multitudinous requirements are produced in many different states. A tax placed on interstate commerce would be equivalent to a tariff wall at the border of every state, and would result in materially increased expenses of operation. This prospect we can only regard with the gravest concern and apprehension.

RECENT TENDENCIES IN NEW YORK

As at present interpreted, the net earnings rule, applied to determine the intangible values of railway franchises in New York State, penalizes the luckless investor who is unfortunate enough to have money in a street railway. It, in effect, says to the stockholder, "You may earn 6 per cent on the capital you have invested but no more. If you earn more, it will be taxed away from you, and if you earn less, it is your own concern and your own loss." This is a condition that may not yet have been brought home to all railway operators, but it will be the next time they have to seek new capital for improvement or expansion.

If a balance were maintained by allowing the intangible portion of the franchises to have a minus value when operation under them was proved to be unprofitable, there would be less unfairness in the interpretation. The public demands that service once established be continued whether or not it is profitable. Why is it radical to suggest that they indirectly pay part of the loss of that service through a credit on the tangible value of the franchise for the negative intangible value? If the service were maintained directly by the public, they would have to pay for its losses through the medium of increased taxes. It is true that railways in common with other public utilities owe a certain debt to the community in which they operate. Yet the public owes a debt to street railways. Look at the property development that has been caused by increased transit facilities. The capital for those facilities had to be hazarded in the hope that profits would result. Sometimes they failed to materialize. Then who stood and is standing the loss, the public or the investor? Where, then, is the unfairness in the suggestion that the public stand some of the loss on unprofitable service maintained for their benefit?

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*Abstract of a paper presented before New York Electric Railway Association on March 2, 1917, in New York City.

As for other benefits to the public from the operation of street railways, there is snow removal. The municipality leaves to the plows and sweepers sent out to clear the railway tracks the entire burden of maintaining a passage through its residence streets. Then there is paving. Why the railways should continue to install and maintain paving for decades after the discarding of horse cars is beyond my comprehension of justice. The paving now is for the use and convenience of automobiles, trucks and jitney buses. This burden should be transferred to them. I do not mean to contend that the railways should not replace in its original condition paving torn up when making repairs or extensions of their tracks, or that they should not bear their just proportion of the total cost of paving equally with other taxpayers and property owners. But when it is decided to change the style of paving or to replace it when worn out (to which wear they have not contributed), no portion of the expense should be charged to them.

Although it is a digression, I would like to mention here the fact that in a report to the 1917 Legislature by the Massachusetts Public Service Commission, it was recommended that "cities and towns should relieve railway companies of unjust and unnecessary burdens of street maintenance." This is the most encouraging incident I have heard of for some time. If only our New York State public service commissions would emulate the example.

Not only is the compensating benefit of paving not considered, but the State Tax Commission actually penalizes the railways for their compliance with franchise obligations. For in figuring the intangible value of franchises, it allows an earning capacity of 6 per cent on all property excluding paving. And in doing so it has been sustained by the courts. When it is considered that companies could use the capital now invested in paving in buying equipment which would benefit their patrons more directly through the improvement in service secured, it seems that the taxing power is following a short-sighted policy in continuing the obligation and penalizing railways for complying with it.

CENTRALIZING ASSESSMENTS

The creation by the Tax Department in April, 1915, of the bureau of special franchises to give individual attention to this important subject was in a way a measure of relief, more in potentialities, however, than in actual accomplishments up to the present time. One important phase of their work needs especial missionary effort on our part. I refer to the subject of valuation. Their methods at present are exceedingly crude and in addition disagree with those in use by the Public Service Commission. We now suffer by this disagreement in both taxation and rate cases. It would seem logical that the work of these two divisions of the State government be co-ordinated in the interest of justice.

The very establishment of the Tax Commission was a tendency toward centralization of assessment. It is to be noted with encouragement that the commission is aiding in the development of that tendency. Last year for the first time the companies were provided with a report to be filed in duplicate. This was a summary of real estate owned, and the duplicate went to the local assessor. We should be glad to see the day when the local assessor is eliminated and the State Tax Department entirely assumes his work. The possibility of getting a fair assessment roll would then be considerably increased. When private property, now assessed at a low rate through political influence, is brought to contribute its fair share of the expense of government, a partial relaxation of the pressure on incorporated business will result.

This tendency toward centralization took its most pronounced step forward in Ohio in 1913, when the Legislature provided for the assessment of all property by the central tax authorities. This law was a little too progressive, however, and was repealed two years later. It is believed that its repeal was largely due to political influence and not to dissatisfaction with its workings. As such, it was only a temporary setback. The law still stands as a sign of the times showing the tendency toward equalization of assessment.

REPORT OF NEW YORK CITY COMMITTEE

The final report of the committee on taxation for New York City, submitted in January, 1916, is worthy of mention as indicative of recent tendencies. In reporting against untaxing buildings it puts, one hopes, a final quietus on the single tax theories of Henry George. For that theory means practical confiscation of railway-owned realty and the taxing of franchises at a rate far higher than at present in vogue. Even the single taxer does not "let up" on the public utility, but expects it with land to provide all revenue necessary for the government.

The recommendation that municipal income taxes and occupation taxes be substituted for the personal property tax is well in accord with recent developments. For the personal property tax falls into that old error of ignoring the varying rate of return on different classes of property. The sanction of a tax on increments of land values is a dangerous inconsistency. It is a sort of half-compromise with the theory of a super-tax on land which the same report refuses to endorse.

But the section of the whole report which engages one's most earnest attention is that calling for repeal of Section 48 of the tax law, providing for the deduction from a special franchise tax of the amount paid by the owner as rental for the franchise and any sums paid which are in the nature of taxes, such as car licenses, etc. One electric railway has already been the object of special attention, a law having been passed preventing the deduction of bridge tolls from the franchise-tax payment. Now it is recommended that this treatment be extended to include all utilities. An especial hardship would be worked on companies which are paying old village or town franchise taxes under original grants. At present these are deductible. The repeal of the section would in many cases almost double the tax imposed and would tax the railway twice for the same privilege.

Consideration of evidence from all quarters leads to but one conclusion, *i.e.*, that for all street railway executives the consideration of tax matters is of prime importance. In earnest co-operation lies the only hope for the future.

Redeemable Cash-Fare Receipts*

Cash-Fare Receipt with Redemption Value in Proportion to Fare Would Check Train Cash-Fare Collections — With Ticket Having Receipt Coupon, Chances for Manipulation Would Be Reduced to Minimum

By R. W. PALMER
General Manager Auburn & Syracuse Electric Railroad, Syracuse, N. Y.

ONE of the most difficult problems confronting the management of an interurban railway is the proper and accurate checking of passenger fare collections. Provided all train fare collections were in the form of tickets, the proposition would be very much simplified. On account of the very nature of the business, however, interurban cars make frequent accommodation stops at points along their line, in addition to the regular station stops where ticket agencies are maintained. As it is impracticable to maintain ticket agents at all stops, a considerable portion of their business is on a cash-fare basis, especially when the cash-fare and ticket rates are the same.

CASH-FARE RECEIPTS SHOULD HAVE FACE VALUE

The proper accounting for cash-fare collections has been recognized by railway managers as a weak link in their system, and a number of devices and methods have been tried out and adopted. The two most widely used are the register and some form of cash-fare receipt, the purpose of this paper being to deal with the latter. In the writer's opinion a cash-fare receipt to have any auditing value must have a face value, so that the passenger receiving such receipt will save it and turn it in for redemption in place of throwing it on the car floor.

Did you ever notice anyone throw away trading stamps or tobacco certificates? If you did, you can rest assured that they will soon be picked up. Even though the value of these certificates is extremely small, they are always saved and a customer is careful to note that the value of the certificates received is in direct proportion to the amount of money expended. The trading stamp and certificate issuing proposition has a bearing on the subject of cash-fare receipts in showing that if the receipt has a value it will be retained and cashed in.

REDEMPTION VALUE SHOULD NOT BE FIXED

In order to induce the passenger to retain and turn in his receipt so that the company may use it for auditing purposes, some electric railways and a large number of steam railroads charge an excess of 5 cents or 10 cents covering all cash fares paid on trains. This amount is refunded on surrender of the receipt to any ticket agent of the company. Where this system is in use the company secures the return through their agents of a large percentage of the receipts issued, as shown by the fact that four companies have secured returns of 97 per cent, 95 per cent, 94 per cent and 88 per cent.

Fixing the value of the receipt at 5 cents or 10 cents is all right as far as it goes. Inasmuch, however, as each receipt has the same redemption value, there is no special incentive on the part of the passenger to see that the receipt indicates the exact amount of fare collected, or that it properly indicates the stations between which such fare is paid. This is the point in which we are all most interested. In order to accomplish the desired result, the redemption value of the receipt should increase in direct proportion to the amount of fare paid.

On a mileage basis this could be handled very nicely by adding a fraction of a cent per mile to the fare collected, which amount could be refunded on surrender of the receipt. For example—provided the ticket fare is 2 cents per mile, the train fare could be made 2.5 cents per mile with a refund of 0.5 cent per mile on surrender of the receipt. Where the 5-cent zone system is used, 1 cent could be added to cover each zone collected. In other words, the train fare for any distance covered by a 10-cent ticket fare would be 12 cents with a 2 cent refund, etc.

The receipt issued by the conductor should be in the form of a duplex so arranged that the amount of refund would appear directly opposite the amount of fare paid. In this way the passenger would know the exact value of the receipt. This arrangement would also show the agent at a glance the amount to be refunded, and the receipt would be handled as cash and turned in by the agent as such with his remittance, after having been stamped "Redeemed."

Along the same lines, I understand that a certain company handling patented cash-fare receipts has in the course of development a system whereby the exchange value of the receipt increases in proportion to the amount of fare paid. The company purchases useful articles of merchandise and sells them direct to the holders of cash-fare receipts at the wholesale cost plus a certain number of cash-fare receipts, as specified in a catalog. Under this plan an amount equivalent to the difference between the wholesale and the regular retail selling price of the article has been paid in cash fares to the railway. For example, a pot-type coffee percolator, standard make, with a regular selling price of $8, would be delivered for $5.04 in cash and a sufficient number of cash-fare receipts, indicating that $2.96 or more had been paid for transportation. The receipts redeemed in this way would be turned over to the company for auditing purposes.

AUDITING CASH-FARE RECEIPTS

In connection with the auditing of cash-fare receipts which have been turned in on account of their refund value, it is not absolutely necessary that each receipt be matched up with the conductor's stub bearing the same serial number, as by picking out any particular month and matching up all the receipts turned in with the stubs a reasonable check can be made. As the receipts are collected from the agent and audited as cash, they can be separated as to the months they were issued. As the conductor's stubs would also be filed under the heading of each month, a check could be made as often as deemed advisable.

TICKET SALES INCREASED

In addition to safeguarding the cash-fare train collections, the rebateable receipt tends to induce passengers to purchase tickets at agencies along the line, thereby eliminating to a great extent the cash handled on the cars and allowing the conductor more time to look after the operation of his train and the comfort of the passengers. This is shown by results obtained on the Cleveland & Erie Railway, Girard, Pa., which property the writer operated up to June 15, 1916. On this road the division of fares for June, 1913, was 49 per cent cash and 51 per cent ticket collections. On Dec. 1, 1913, the rebatable cash-fare receipt (Macdonald System) was adopted, after which time the ticket sales increased so that for June, 1915, the division was on the basis of 67 per cent ticket collections and 33 per cent cash fares handled on the cars, an increase of 18 per cent in ticket sales. On another property, prior to adopting the rebateable cash-fare receipt, the cash-fare collections amounted to 80 per cent of the total fares collected, while under the new system the ticket fares run approximately 80 per cent of the total collections.

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*Abstract of paper presented before New York Electric Railway Association on March 2, 1917, in New York City.

NO HARDSHIP TO PUBLIC

The argument is sometimes advanced that a passenger boarding a car at a non-agency station should not be required to pay an increased fare over the passenger who on account of living near an agency station has an opportunity to purchase a ticket. This argument implies that there is a discrimination, or that the passenger is penalized by being required to pay the increased rate. The majority of interurban roads, however, have reduced forms of transportation, mileage and commutation books on sale at all ticket offices, which can be purchased for a few dollars. In addition to placing on sale at agencies regular card tickets covering points between which travel is frequent, a special blank or punched form of ticket could be sold by agents entitling the holder to travel between any two points which may be indicated on this special ticket at a rate of 2 cents per mile for the distance actually traveled, the minimum fare in all cases being 5 cents. The above forms of transportation should be sold with a liberal expiration-date allowance, or preferably with all time-limit restrictions removed.

Provided a railway maintains a reasonable number of ticket offices where tickets can be purchased for use between all points on its line, and also has on sale mileage and commutation books, it cannot be considered a hardship on the traveling public to collect a slight increase per mile covering all cash fares collected on trains, if this difference is refunded to the passenger on surrender of the receipt issued by the conductor. The whole intent of the rebateable cash fare receipt is to have the receipts returned for auditing purposes, as it is not the desire of the company to increase its revenue by making a difference in the train fare collections over the regular ticket rate.

In addition to the redeemable cash-fare receipt and as a further protection to prevent the possible manipulation or reselling of uncanceled tickets, all tickets could be made with a detachable receipt to be detached by the conductor and turned over to the passenger as a hat check, such tickets being void if presented for passage with coupons detached. Conductors would be instructed, however, to punch both ticket and coupon so as to prevent any possibility of the passenger attempting to use an old receipt, in which case the conductor's punch mark would be of value.

The issuing of a cash-fare receipt having a redemption value which increases in direct proportion to the amount of fare paid would serve as an absolute check on all train cash-fare collections over 5 cents. Provided a ticket having a receipt coupon is also used, it would seem that the chances for manipulation of cash fare or ticket collections would be reduced to a minimum.

Indemnity and Surety Bonds*

Expert Explains Bonds Conditioned Upon Fidelity of Employees and Bonds for the Performance of Contracts

BY WILLIAM N. TOMLINS
Vice-President American Surety Company, New York, N. Y.

THE surety business, though still in its infancy, has grown to large proportions during the past decade. Those branches of the business which most concern electric railway officials are what we know as fidelity business and contract business; that is, bonds conditioned for the fidelity or honesty of a principal and bonds conditioned for the performance of contracts to construct some piece of work.

There are substantial differences between suretyship and insurance. For instance, insurance may be oral, but suretyship for another must be in writing. By insurance, the insurer takes the hazard without expectation of indemnity, while in suretyship the surety in every instance has the right of recovery from his principal. In insurance there are only two parties, the insurer and the insured, while in suretyship there are three parties—the principal, who is or may become a debtor and must indemnify the surety, and the one who is or may become a creditor, and the surety. In insurance the insurer is bound on the happening of the event insured against, while in suretyship the surety is only bound in case the principal fails to discharge his obligation.

FIDELITY SURETYSHIP

In general, the purpose of fidelity suretyship is to indemnify the employer against loss from the dishonesty of an employee. The methods used in judging of the acceptability of an applicant for suretyship are practically the same in all companies. The principal features include the receipt of an application wherein the following information is given: (1) The names of former employers for a period of at least ten years: (2) the names of from five to seven references; (3) information of his financial responsibility, the amount of his salary, his debts and the number of persons depending upon him for support. We also make it a point to inquire about the employer's standing, both moral and financial, and particularly with reference to the safeguards surrounding the employment, the system in use by the employer to prevent losses and the frequency with which the applicant's books are examined.

A source of trouble in the past in connection with fidelity bonds has been the statement required from the employer about the methods of business and the safeguards thrown around the employee. It is necessary for the surety to have something of this kind, but the practice grew up, with some companies at least, of so framing those certificates as to justify the assertion when a loss came that unless the employer had exercised the oversight mentioned the surety could not be required to pay. Experiences have convinced most, if not all, of the surety companies, however, that even in those cases where they take such a certificate it shall not constitute more than a mere statement of the employer as to the methods of transacting that part of business with which the employee is connected. Hence, if through inadvertence some one of those methods is overlooked or perhaps intentionally dispensed with, it will not interfere with the employer's right of recovery from the surety if loss is suffered through the wrongdoing of the employee.

The safety of such a business consists in inducing those who are covered by bonds to believe that honesty is the best policy and to live and act accordingly. It recognizes the market value of a good reputation, right living, creditable family connections and a good home. It is undoubtedly true that placing an employee under bond throws around him a wholesome restraining influence, for he thus knows that an obligation besides faithfulness to his employer rests upon him.

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*Abstract of paper presented before New York Electric Railway Association on March 2, 1917, in New York City.

CONTRACT BONDS

Contract bonds are a prolific source of income to the various companies, and in the last few years have assumed large proportions, both as to premium and losses. In bonds conditioned for the performance of contracts to do different kinds of work, one may be interested from either of two standpoints: the first, where he is required to give a bond, as, for instance, where he is doing the work for someone else; and the second, where he takes a bond from someone who is doing work for or under him, as, for instance, where he sublets portions of a contract.

Curiously enough, the form of bond required has outgrown all proportions, until now one is frequently asked to give bonds conditioned not only for the performance of the contract, but also to protect the owner against many imaginary losses for which he cannot be held liable. The excessive liability of such bonds leads the surety company to charge more, because the terms lead to successive trouble and litigations, all causing unnecessary expense. All this might easily be avoided by simply giving one's bond covering his failure to perform his own contract, which is all that the owner could possibly require.

Contractors of doubtful responsibility sometimes advocate the giving of a bond which shall constitute a direct promise for the payment for materials and everything else to the end that they may buy on credit, finish the job perhaps at a very low figure, collect everything collectible and then decamp. All of this is to the detriment of the contractor who tried to get fair pay for his work and who of necessity must get fair pay to the end that he may meet his own obligations.

Corporate suretyship, whether of the fidelity class or the contract class or otherwise, is far more to the purpose than the suretyship of the individual.

Railway Club of Rochester Meets

The transportation representatives in Rochester, N. Y., covering steam and electric railroads, and express companies and fast-freight companies, have organized under the name of the Railway Club of Rochester. The objects of the club are to promote understanding of railway problems and increase professional and social intercourse among its members.

The club meets on the last Monday evening of each calendar month. Papers on some subject of interest to members are presented by previously designated members and the discussion of the papers is participated in by the members. On Jan. 29, Dr. P. H. Conboy, company oculist of the Buffalo, Rochester & Pittsburgh Railway, presented a paper, "The Selection of Employees for the Transportation Department," and J. E. Burnes, supervisor of car service for the same company, presented a paper, "Per Diem Charges."

The officers of the club are Robert W. Davis, freight traffic manager, Buffalo, Rochester & Pittsburgh Railway, president; S. J. Kearns, superintendent, New York Central Railroad, first vice-president; E. J. Cook, general manager, New York State Railways, second vice-president; J. P. Barnes, general manager, Buffalo, Lockport & Rochester Railway, third vice-president, and E. F. Kelley, purchasing agent, Buffalo, Lockport & Rochester Railway, secretary and treasurer.

Outlook Hopeful Through Publicity and Square Dealing

Addresses in Boston Last Week by Mr. Dreier and Former Governor Cobb of Maine Point the Way Toward Better Public Relations

Electric railway men who attended the meetings of the Massachusetts Street Railway Association and of the New England Street Railway Club at Boston last week went home with renewed courage to attack the service problems, for at each meeting the optimistic note was struck that given frank publicity and square dealing the public utilities are sure in time to win. The Massachusetts meeting Feb. 21 was addressed by Thomas Dreier, assistant to the president Bay State Street Railway, who likened the present financial situation of many street railways to the condition in which Robinson Crusoe found himself after landing upon his island. The whole theory of Crusoe's activity was to use what he had to get what he needed. To-day the street railway is situated on an island surrounded by a sea of legal restrictions. Complete service to the public must be the basis of any success in overcoming the present difficulties. The time has come, the speaker said, for the companies to inculcate the facts relating to their business, notably among their men, and this could well be done through company publications in which officials and employees could express their ideas. The bulletins of the Brooklyn Rapid Transit Company were commended for their frank treatment of transportation problems, courtesy, stealing of fares, poor appearance, etc.

Mr. Dreier said that frequent talks by officials of the company and by outsiders in sympathy with its work and problems are helpful. Letters of praise for good work should be published, and whenever such a letter is received it should be read to the employee concerned. More attention to publicity and less hiring of lawyers to get companies out of trouble are desirable. In conclusion Mr. Dreier urged companies to tell the public about the good work they are doing.

EX-GOVERNOR COBB ON PUBLIC RELATIONS

At the New England Street Railway Club meeting Feb. 22 former Governor William T. Cobb of Rockland, Me., who is at present affiliated with various public utility interests, spoke on "Public Relations." He said that public utility development could never have been started if the promoters of the early companies had not been convinced that more than 5 per cent interest would be the reward of their enterprise, energy and faith. "The present situation cannot go on," said the former Governor. "Men won't put their money into these enterprises unless guaranteed a fair and a safe return. But, in the end, I believe that the sound common sense of at least a New England community will see that these corporations get a fair and honest deal."

In closing, the former governor said that inasmuch as the money of the companies must come from the public, it is time to stand up and insist upon company rights. The public are the customers of the companies, not their patrons. It is time to let the public know that the companies are honest, decent and fair-minded. "Nine-tenths of our electric railway managers are afraid to go before the commissions and demand their just dues," said the speaker, who deprecated delegating these tasks to lawyers. "A better day is coming. The corporations are doing right to-day, and I believe that the public will do right, too, ultimately. The public is treating us unfairly, almost dishonestly to-day. We have got to get better rates, and then our troubles will largely be over."

American Association News

A. E. R. A. Joins Chamber of Commerce of United States—Transportation-Accounting Committee Meets in New York—President Storrs Appoints Committee on Accident Reduction—Application of Safety Code Urged by A. E. R. E. A.—Activity in the Company Sections

Association Joins National Chamber

As a result of the action of the executive committee of the American Electric Railway Association, that organization has become a member of the Chamber of Commerce of the United States. Gen. George H. Harries will represent the association as national councilor. In addition, the association is entitled to ten delegates at the annual meeting. At the meeting recently held in Washington J. H. Hanna, of Washington, sat in the National Council as a substitute for General Harries, who was unable to attend, and C. Loomis Allen was present as a delegate.

Transportation-Accounting

On Feb. 19 the transportation-accounting committee of the American Electric Railway Association held a meeting at headquarters in New York. Those in attendance were Chairman A. E. Dedrick, auditor Mahoning & Shenango Railway & Light Company, Youngstown, Ohio; G. E. Kalweit, auditor Milwaukee Electric Railway & Light Company, Milwaukee, Wis., and W. O. Ingle, auditor New York State Railways, Rochester, N. Y.

The meeting was held for the purposes of carrying on a general discussion and forming plans to collect data on the following subjects:

1. Determination of a formula to show the cost per annum for hauling 1 lb. or 1-ton car weight.

(To continue the following subjects assigned the 1916 committee):

2. (a) Investigation of cost of handling baggage free to determine whether the cost of handling this baggage wipes out the profit resulting from the fare received.

(b) Investigation of sub-division of power cost between maintenance, construction and operation.

3. Forms of graphic presentation of transportation data and statistics.

The committee will at once begin the collection of data along these lines.

Manila Section Awards Medals

At the meeting of joint company section No. 5 held in Manila on Jan. 9, 1917, the feature was the award of medals by the company to the writers of the best three papers presented before the section during the past year. The awards were made to the following: C. H. Van Hoven, claim agent, gold medal for his paper on "How the Claim Agent Earns His Salary"; E. I. Jefferey, assistant chief engineer power plant department, silver medal for his paper entitled "The Power Plant Employee and His Qualifications," and Eugene Wagor, traffic inspector transportation department, bronze medal for his paper on "Duties of Trainmen." The abstracts of these papers were printed respectively in the issues of the ELECTRIC RAILWAY JOURNAL for Aug. 5, 1916, page 235; June 24, 1916, page 1187, and Sept. 23, 1916, page 538. F. P. Santiago, the new president, assumed office at this meeting and appointed committees for the year, after which a game of volley ball was played. As usual the transportation department orchestra furnished music during the evening.

Committee on Reduction of Accidents

President Storrs has appointed a committee of the American Association to report upon ways and means for securing a reduction in accidents at grade crossings with steam railroads. The committee will take up the entire question as regards education, protective appliances, apparatus and legislation.

The members are: B. I. Budd, chairman, Chicago; Henry G. Bradlee, Boston; R. B. Stearns, Milwaukee; A. M. Patten, Topeka; E. C. Faber, Aurora; T. W. Wilson, Wilmington, and E. W. Wakelee, Newark.

A. E. R. E. A. Urges Application of National Safety Code

The second edition of the National Electrical Code has been issued by the Bureau of Standards "for examination, trial and constructive criticism." The results of its tentative operation will be investigated by a special committee appointed by the Association and which will represent the Association in matters pertaining to revision of the code after a period of actual trial. Secretary E. B. Burritt has sent letters to member companies in an effort to emphasize the importance of a thorough trial application of the code and of suggestions for changes before its final form is recommended for adoption. Another letter has also been sent to members of various committees urging them to develop helpful criticism and suggestions.

Dean Frank H. Sommer Speaks at Newark

A convincing address on the topic "The Man on the Outside and the Man on the Inside—What is Needed to Bring Them Together?" was delivered at the meeting of the Public Service Railway Company section at Newark, N. J., on March 1, by Frank H. Sommer, dean of the New York University Law School. He outlined the fundamental principles involved in the administration of private property devoted to public use and pictured the conditions under which the public and the utilities must come together for adjustment of their points of view.

Before the address a splendid tribute was paid to the memory of the late J. J. Burleigh, until his death second vice-president of the Public Service Corporation, by J. L. O'Toole, of the publicity department. Mr. Burleigh had been one of the most active supporters of the company section and was in close touch with the personnel of the organization through the welfare work of which, among other things, he had charge.

Section President A. T. Warner stated that the membership is now 445. He explained a plan for securing constructive criticism of the proposed standard definitions which the T. & T. Association has in preparation.

The plan in brief is that copies are to be distributed to all interested members, comments are to be received by the secretary and turned over to a special committee, and finally the committee is to edit the comment and forward a report to Secretary E. B. Burritt. Mr. Warner commended the new scheme for securing the assistance of the company section membership in association committee work.

Section No. 4 Discusses Fare Increase

At the meeting of the Washington Railway & Electric Company section held on Feb. 19, Clarence P. King, president of the company, addressed the local members recommending a straight 5-cent fare. Mr. King said it is a very difficult problem to improve the service under the prevailing conditions of tremendously high prices of materials and labor and that he believed the public would not object to paying the straight fare if better service could be given.

Col. Robert N. Harper, chairman of the inaugural committee, also spoke at the meeting. He urged that courtesy on the part of the company employees be shown to inaugural visitors at the capital as this would go far toward creating a widespread favorable opinion of public utilities. Other speakers were representatives of the Federation of Citizens' Association, the Board of Trade and the Chamber of Commerce.

Toledo Section Has Large Membership

At the meeting of the joint company section recently formed by the Toledo Railway & Light Company, Toledo, Ohio, the announcement was made that the charter membership comprised 321 persons; 168 from the N. E. L. A.; 120 from the A. E. R. A.; twenty-three from the N. D. H. A. and ten from the A. G. I. At the meeting T. J. Nolan was elected president; D. E. Snider, vice-president; H. Friede, secretary, and A. T. Van Griesen, treasurer. Members of the executive committee were also elected and announcement was made of the action of the executive committee on Feb. 19 in appointing chairmen of the committees on finance; education and library; publicity and attendance; meetings, program and papers; group work; by-laws and constitution; entertainment, and membership and hall.

The meeting was largely of an entertainment character, the feature being a "stunt" entitled "A Bit of Southern Minstrelsy." Motion picture films furnished by the General Electric and Westinghouse Companies were also shown.

Professor Woodworth Lectures Before Section No. 6

At the regular meeting of the Chicago Elevated Railroads company section, held on Feb. 21, Prof. P. B. Woodworth, of the Lewis Institute, lectured on the subject of "Voltage Loss or Drop." He illustrated the lecture with experiments, using original apparatus. This is the second lecture delivered by this speaker during the current season and it is expected that he will lecture again in the near future.

By way of entertainment "The King of the Rails" film, secured from the General Electric Company, and a short film showing the return of the Seventh Infantry, N. G. Ill., from Fort Sheridan over the North Shore and Northwestern Elevated, the detraining at Randolph Street and Fifth Avenue Station and the parade through the loop was also shown. This meeting was notable in that more than 240 persons were present, the largest attendance since the organization of the section.

COMMUNICATIONS

Classification of Trucks

BROOKLYN RAPID TRANSIT SYSTEM
BROOKLYN, N. Y., Feb. 24, 1917.

To the Editors:

The suggestion recently made by S. A. Bullock in regard to classifying trucks is very simple, and it is comparative as far as the various classes of trucks are concerned. But it is not definite as to the exact style. For instance, the Brooklyn Rapid Transit Company uses Brill 39-E, 39-E-1 and 62-E trucks, which are all maximum-traction trucks with one outside-hung motor and a 54-in. wheelbase. All would come under the symbol 10-54-40 without any ways or means of identifying the style, and it would seem to me that, instead of the center-plate loads a letter defining the style should be used. For instance, 39-E might be 10-54-A; 39-E-1 might be 10-54-B, and 62-E might be 10-54-C. The center-plate load figures could be placed after the letter if deemed necessary. However, the information would not be required to define the type of truck, and this would greatly simplify the memorizing of the symbols.

W. G. GOVE,
Supt. of Equipment.

Rake of Trolley Poles

THE CONNECTICUT COMPANY
NEW HAVEN, CONN., Feb. 28, 1917.

To the Editors:

In the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 17 there appeared a letter from J. G. Koppel on the subject of the rake of trolley poles. This letter was particularly interesting as showing what different aspects the same subject may offer to different observers. Mr. Koppel feels that the raked pole is inartistic, and questions if the treatment has any excuse. The majority of line engineers, and incidentally a great many municipal authorities, desire the poles raked not so much for the slight reduction in the horizontal component of the span pull or bracket load as for appearance's sake.

Obviously where trolley poles are sandwiched among other poles, if the first are raked and the others plumb, there is an unpleasant contrast in looking along the line. Under such circumstances the rake is better omitted. In fact, if the line also carries circuits on crossarms the poles are necessarily set plumb to prevent interference. But where there is no such condition it will be found that, as a result of the sag of the span, a span pole set plumb appears to the average man as if it leaned into the street. The writer has heard of several instances where poles ordered set plumb by the authorities were later given a rake by request of the same authorities because of this optical illusion.

In the case of a bracket pole the projecting bracket has not as much effect as the sloping span, but here too a plumb pole appears as if leaning outward. With guyed poles the rake has another function. The pole is a strut, and as such should bisect the angle between the opposing forces, which act along the guy and the span. This compels that a backward lean be given to the pole.

As to the values of rake to be used, there is no particular warrant for any definite ones, but those given in the Engineering Manual, Ds 2b, Section 18, are practically the values in use the country over, expressed in a very simple relation.

In regard to the esthetics of the matter, it may be said that while the plumb line, square, and level are highly important in mechanical construction, Hogarth's "line of beauty" is not the product of any nor yet of all of these. The triangle still stands as the symbol of unchanging resistance and the arch is the type of graceful strength. It is not "deadly parallels" that are needed to make our streets artistic. The most beautiful highways are those bordered by trees, whose lines do everything but appear straight, either vertically or horizontally, and the beauty of the old cathedrals arises more from the curves than the corners. Neither span nor bracket construction is an element of civic beauty, but in the majority of cities one or the other is a necessity. If either construction is so arranged that not only do the poles resist the forces applied against them but by their position they have the appearance of so doing, their fitness for their purpose is best indicated. After all, this is true art.

CHARLES R. HARTE,
Construction Engineer.

Completed Timber Treatment Necessary

THE SOUTHWESTERN ELECTRICAL & GAS ASSOCIATION
DALLAS, TEX., Feb. 24, 1917.

To the Editors:

In the editorial in the Feb. 3 issue of the ELECTRIC RAILWAY JOURNAL, on the subject of the proceedings of the American Wood-Preservers' Association, a statement is made which might be misleading to many untechnical users of wood or to those who are not fully conversant with the whole science of wood preservation.

The statement to which I refer is the one which says:

> It appears that not even wood preservers have universally recognized the inability of any commercial process of preservative treatment to stop decay that has once obtained a foothold.

This statement is only correct when very partial treatment is given to the timber. As is well known the destruction of wood by so-called "decay" is really a chemical action caused by the presence, growth and multiplication of enzymes, nearly all of which are sensitive to fairly high temperature and vacuum and are especially sensitive to even the fumes of certain chemicals or coal-tar and mineral-oil derivatives.

Unless the entrance into the pores of the wood of the preservative is done by the plain absorption or tank method, if the timber is subject to steam heat or to a fairly full vacuum, the destruction of the enzymes will be absolute, and if the wood is then subjected to even a partial treatment the interior will be protected as long as the treatment-skin is intact. Of course there is always the contingency that this preservative skin may be ruptured intentionally or accidentally and, as stated by you, a passage opened to the interior by which the enzymes may obtain access to the untreated timber and commence their work of destruction. It is for this reason that the writer has always advocated a complete "treatment," viz.: an injection of the preservative entirely through every portion of the timber. He believes that anything less than this is a final waste of money and a possibility of the risk which always accompanies decayed timber, especially where such timber is not accessible for constant inspection.

The point at issue is that while the proper handling of the timber before and after treatment is somewhat of a factor in the final perfection of the treatment it is not by any means so important a factor as is the thorough and complete injection of the preservative through every portion of the timber. Proper seasoning of the wood before treatment is not a prerequisite of perfect treatment, but in a great many kinds of wood it does lessen the cost of the actual treatment and, to a very small extent, tends to preserve the cellular structure of the timber by making unnecessary the high temperature and high vacuum generally used where green timber or unseasoned timber is being treated. The writer has yet to see a case in timber exposed to the elements where skin treatment or anything short of full permeation of the preservative has not been a failure, or at least only a partial success. What makes this view of the matter more vital is the fact that, properly applied, the full permeation of the timber by a sufficient amount of the preservative to protect from decay costs but very little more in proportion than does the skin or shallow treatment.

The writer, in conjunction with Fred Langbahn of Galveston, made the first experiments at Galveston on the full permeation of timber by all classes of preservatives and without injury to the strength of the timber or the fiber or cells. It was proved to him then that the life of billions of feet of timber had been sacrificed to a small saving in money and time. His conclusions in this respect were verified at the time by a United States official, and they have been more than proved since that time by the adoption of the proper principles of wood treatment by nearly every wood treating plant in this country and abroad.

The writer wishes again to urge as regards both ties and paving blocks the complete permeation of the whole mass of the timber by sufficient of the preservative to kill any destructive germs or plant which may be in the timber at the time and to allow for the gradual evaporation or leaching out of the preservative thereafter. He would add that it is not necessary to overload the outside of the timber with the preservative, if care be taken and ample time be given in the treating process. It is always advisable to leave a *small* surplus of the preservative at the end of the filling process, as this will be distributed through the timber to a greater or lesser extent by capillary process thereafter. Also, as evaporation or leaching out of the preservative will occur first on the outside of the timber, a little excess left on the outside will permit such evaporation or leaching out without reducing the amount of the preservative below the danger point.

The writer at various times has seen a great deal of timber filled to saturation, or beyond, for a short distance on the outside while the interior had none whatever, and while such timber has been sold and guaranteed as containing such a per cent or such a quantity of preservative per cubic foot, and while this guarantee was true to the letter it was not true as regards the intent of such treatment which is, in all cases, so to fill all the pores and cells of the timber with preservative and without injury to the strength of the timber as to kill all inclosed enzymes and prevent their re-entrance for as long a time as possible in the future.

H. S. COOPER, Secretary.

The Buenos Aires Great Northern Railway is electrifying its suburban lines on a plan similar to that of the Central Argentine Railway. It will use a third-rail at 800 volts and energy will be supplied from the power station of the Buenos Aires Western Railway. The progress in electrification of the suburban sections of each of the above-named roads promises electric service for the suburbs of Buenos Aires in the near future comparable with those to be found in the other large cities of Argentina.

Practical and Economical Solutions of Problems in
EQUIPMENT AND ITS MAINTENANCE

Getting the Scale Out of Surface Condensers —Syracuse Front-Entrance, Center-Exit Car— New Way of Welding Trolley Poles—Other Shop and Line Stories and New Apparatus

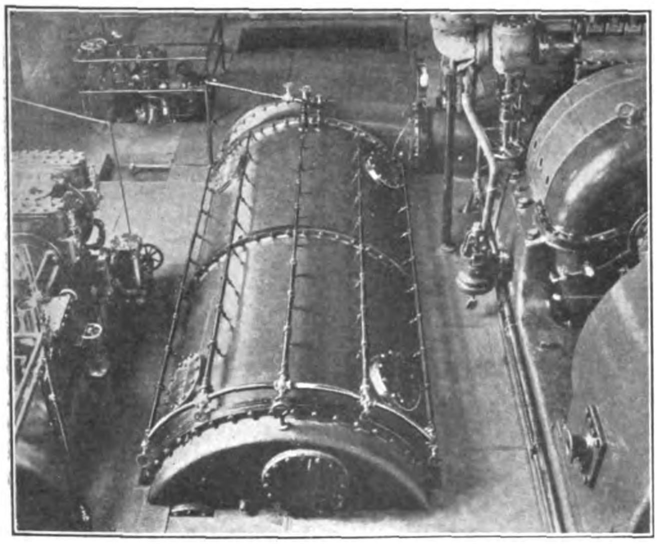
(Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.)

Surface Condenser Cleaned with Kerosene

Effective Means Provided for Periodic Spraying to Remove Scale and Other Deposits

BY F. C. CHAMBERS
Mechanical and Electrical Engineer, Des Moines City Railway, Des Moines, Iowa

A 1100-sq. ft. Worthington surface condenser is installed in the power station of the Des Moines City Railway for use with a 2000-kw. mixed pressure turbine which operates on the exhaust from two 1000-kw. reciprocating units. Naturally the oil content in the exhaust steam is high and this was formerly the cause of considerable difficulty. The turbine would carry only about 1000 kw., and it was finally taken down to find that some 20 per cent of the blades were entirely closed off with deposit. This and the poor vacuum caused by deposit and scale in the condenser were, of course, responsible for the poor operating characteristics. After cleaning up the machines the turbine would carry 2000 kw. and considerable overloads without trouble, and the plant coal consumption was cut down very appreciably.


PIPING ARRANGEMENT ON SURFACE CONDENSER FOR SPRAYING KEROSENE FOR CLEANING

In order to make these conditions permanent and prevent recurrence of the deposit accumulation, a scheme was devised for cleaning turbine and condenser which has been very effective.

A 2-in. pipe was installed to connect the circulating pump with a 2-in. header at one end of the condenser. From this header five pipes, each varying in size from 2 in. in diameter at the header to ¾ in. in diameter at the far end, were connected up across the section of the condenser above the turbine room floor, as seen in the illustration. Each of these was tapped into the condenser through nine small bore pipes. Then once about every three months, with the machine shut down, the hot well is pumped dry and a barrel of kerosene oil dumped into the handhole in the condenser. The discharge pipe on the hot well pump leading to the heaters is closed off and the valve in the pipe leading up to the header over the condenser opened. The hot well pump is then used to force this kerosene from the hot well under pressure around through the spray nozzles. It is circulated for from two to three hours and then drained and allowed to settle. The light oil coming to the top is poured off and used to put through the turbine.

The kerosene treatment is given to the turbine in 50-gal. quantities once a week through a ¾-in. pipe with numerous needle point holes in it, which is inserted across the steam intake pipe. This kerosene is also carried to the condenser with the steam and helps to keep it free of deposit. This, with the thorough cleaning of the condenser every three months, has kept turbine and condenser in good condition. A test of the condenser condition is made frequently by means of the vacuum gage which is piped up so that it may be made to read the pressure at the intake and outlet sides separately, and the difference gives a good indication of the condition of the condensing surfaces.

Hot-Water Heaters for Electric Cars

Suggestions Given After Several Years' Experience with This Type of Heater Installed on More Than a Hundred Cars

BY F. J. FOOTE
Master Mechanic, Ohio Electric Railway, Columbus, Ohio

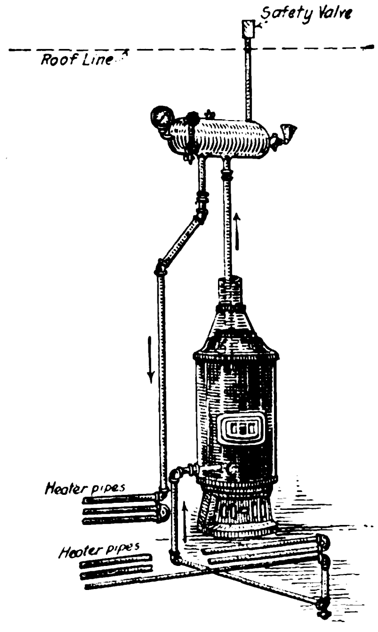
The writer hopes that a brief description of some experiences in the installation, maintenance and operation of hot-water heaters may be useful to others interested, and that it may provoke some discussion on the subject.

INSTALLATION

In regard to installation, it has been our experience that careful attention to every detail is well repaid in more satisfactory operation of the plant. The most important requirement in the operation of any hot-water heating system is rapid circulation of the water. Anything that offers undue obstruction to the flow in the pipes, therefore, should be avoided.

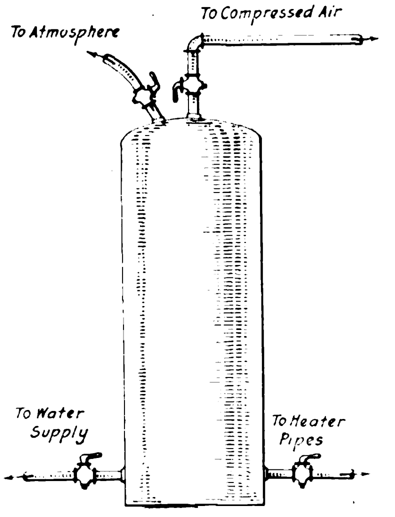
It is incorrectly believed by some that the steam pressure generated by a hot-water heater, assists in the circulation of the water. This is not the case, however, for the pressure in the expansion chamber acts equally on both the hot-water and the cold-water columns. The force that causes circulation is due to the difference between the density of the water in the heater and adjacent pipes, and in the remainder of the heating pipes throughout the car. The cooler water in the latter portion of the circuit, being heavier than the hot water at the heater, forces it to rise and thus produces circulation. It follows that a hot fire causes more rapid circulation of the water, due to the resulting greater difference in density of the water columns.

Until the water reaches the boiling point, this difference in density is caused by the difference in temperature only. Above the boiling point it is due largely to the presence of small globules of steam, formed in the water as it passes through the heater coil. The mixture of steam and water, being much lighter than water itself, creates a much more rapid circulation than is possible below the boiling point. Since the rise of pressure, as shown by the gage, is simultaneous with this action, it was thought that steam pressure is necessary to good circulation.



HOT-WATER CAR HEATER, SHOWING PIPE CONNECTIONS AND AUXILIARIES

Since the force that causes the water to circulate is very feeble, especially below the boiling point, it is highly important that the circuit be as free as possible from short bends, and that the pipe have a smooth inner surface. If the pipes are cut with an ordinary pipe cutter the ends are likely to be rough and partly closed. The ends, therefore, should be reamed out to remove rough edges or burrs.

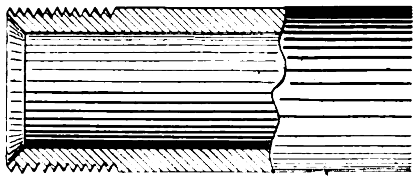


AIR BRAKE RESERVOIR TO INCREASE WATER PRESSURE FOR CLEANING

The height of the heater above the floor of the car is not important, but the expansion tank should be placed as high as possible, although it is not necessary to place it on the roof. A safety valve should be located above the roof and connected by a straight pipe to the expansion tank. A small pet-cock should be tapped into the top of the tank to permit the outlet of air when required, and a gage glass, filling cock and reliable pressure gage should also be provided. The cross-over pipes under the car floor, which connect the two main sections of the heating pipes at the sides of the car, should be covered with a good pipe covering and provided with large-size cocks for use in draining and washing.

The most important consideration in the maintenance of hot-water heaters is keeping the pipes clean. This can be done by connecting one of the drain cocks under the car floor to a hydrant, opening both drain cocks and forcing water through the pipes at a high velocity. This has a tendency to dislodge any dirt or scale that may have accumulated in the pipes. It is advisable to force the water through the pipes in both directions. At one of our carhouses, where the low water pressure is ineffective, the use of an old air-brake reservoir and compressed air from the shop air system was employed for cleaning, with excellent results. An accompanying illustration shows the connections to the reservoir. To operate, the cocks leading to the heater pipes and compressed-air supply are closed, and the others are opened to admit water to the reservoir and let the air out. When the reservoir is full of water, the latter two cocks are closed and the others opened, permitting the air pressure to force the water through the heater pipes. This operation is repeated if desirable.

The pipes should be washed at least each year before putting the heaters in service, and if muddy make-up water must be used washing should be done more frequently. Too much stress cannot be placed on the necessity of putting the water through the pipes at a high velocity. We have just had a case that confirms this. A certain car that had heated well for years began to be known as a "poor heater." With a good fire in the stove and the steam gage indicating pressure, some of the pipes were cold. After washing the pipes several times in the ordinary way with no marked improvement the heater was disconnected and part of the pipes removed. The cross-over pipes were disconnected, and each section and the heater itself were connected separately to a water hydrant with 1½-in. fire hose. A considerable quantity of very dirty water came out of the pipes, but the heater was practically clean. After this thorough washing, the car heated as well as ever.



END OF PIPE REAMED OUT TO REDUCE FRICTION

The safety valve should be cleaned and tested at least once or twice each year. New springs should be put in about every two years, as the old springs are weakened by rust so that, when compressed to give the required test pressure, they will not allow sufficient lift of the valve to relieve the pressure rapidly.

The grates in the heater should be kept in first-class condition so that a good fire can be maintained with the least amount of labor and fuel.

OPERATION

Proper operation requires a good fire and plenty of water in the heater. Putting water into the system is a very simple matter when the heater is cold, but with steam pressure the pipes must be connected to a hydrant, or a force pump must be used. We have found a small hand force pump, such as is used for spraying shrubbery, with a quick-action coupling, to be very convenient. This can be connected to a drain cock under the car floor or by a special connection put on the expansion tank.

Trouble is sometimes experienced in filling the pipes on account of air pockets. Frequently, after filling the system apparently completely, as soon as a fire is started or the car moved, the water in the gage glass will disappear. This is due to the entrained air working out of the pipes. A good method for filling an empty system is to fill it completely and then add water as the fire becomes hotter until the level in the glass is constant and a good circulation is established. A very hot fire just after filling helps much to drive the entrained air out of the pipes.

The fire maintained depends largely upon the operator. One man will keep a good fire, while another will take the same car and let the fire go out in a short time. A good quality of hard coal, of proper size, should give no difficulty, although crushed coke requires attention to drafts to maintain a uniform fire. Hard coal of very small size is better when mixed with about an equal amount of crushed coke. The secret in handling hard-coal fires is the frequent addition of a small amount of coal. The later types of hot water heaters are provided with magazines. We have found that most of these magazines are too short to give satisfactory results and have lengthened them so that they give the proper depth of fire over the grate.

Special Machine Used to Repair Trolley Poles

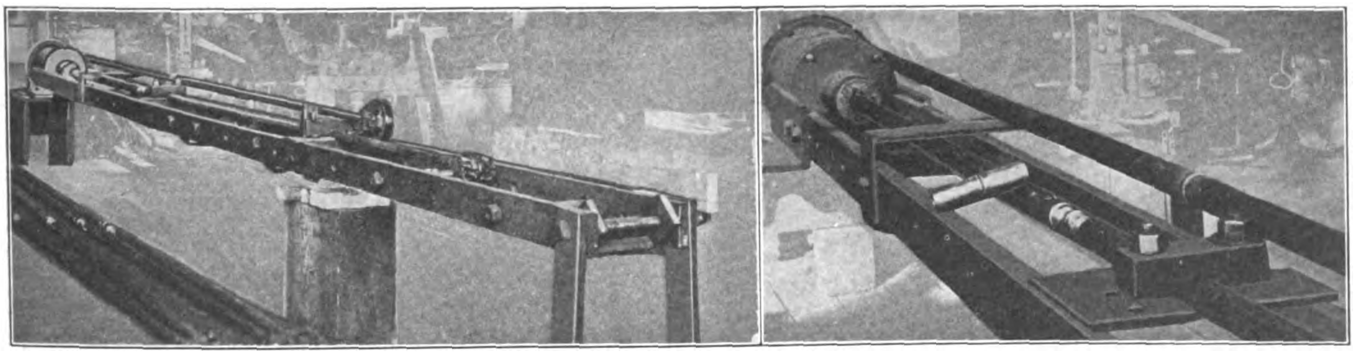
Joint Reinforced with Steel Tube Before Being Welded Gives Good Results at Low Cost

BY G. J. SMITH

Superintendent Rolling Stock and Shops, Kansas City (Mo.) Railways

At the shops of the Kansas City (Mo.) Railways considerable saving has been effected by the use of oxy-acetylene cutting and welding, especially the latter. The recent status of prices and deliveries on various metal articles has been a great incentive for wider use of this method of repairing; in fact, we wonder how we ever got along without it.

A notable example of the saving effected is in the welding of trolley poles. Our standard is a 14-ft. cold-drawn, reinforced, seamless pole, which costs us $3.20 under normal conditions. A recent request for quotations brought a delivery promise of ninety-four to ninety-six weeks, and as a result a method of welding broken poles was worked out which is taking care of our requirements very well. Our previous method, which was not entirely satisfactory, was simply to cut off the ends of the poles and weld them together in the ordinary manner; but they frequently broke at the weld. This was no doubt due in part to the fact that the pole struck the overhead equipment at approximately the same point on the pole as it had on the previous break, thus putting the strain in the same place. Our present process of welding poles is as follows:



PRESS FOR FORCING REINFORCING TUBE INTO SECTIONS OF BROKEN TROLLEY POLE, AND ENLARGED VIEW SHOWING ONE OF THE REINFORCING TUBES

When a number of broken poles has accumulated they are sorted out and pieces matched to give the correct length. These are straightened in a special die on the bulldozer and the ends cut off square. Each piece is then placed in a special lathe, with the tailstock far enough from the headstock to allow for a slight movement of the end. The pole is clamped to prevent it from turning. A reamer placed in the headstock is run into the end of the pole, reaming it out to about 1 7/16 in. diameter for a length of 3 in. At the end of the travel of the reamer a special cutter trues up the end and cuts the outside edge off on a bevel, as is required for welding. The pole is then ready for the application of an interior reinforcing tube, for which a piece of seamless steel tubing with 1½-in. outside diameter and a 3/16-in. wall is used on account of its strength, ease of machining and smoothness of surface after turning. It is cut into pieces 6 in. long, which are placed in a lathe equipped with a cone in both headstock and tailstock. These cones, of course, automatically center the tubing and no chuck or clamp is required. The tube is turned to a drive fit in the pole, with the exception of a collar about ⅛-in. wide in the center, which is left full diameter to insure the centering of the tube between the pole sections.

The sections are then placed in a special press, designed for the purpose and consisting of a double-bar frame with a tail block at one end and a 10-in. brake cylinder at the other. The reinforcement is started into place and the press forces the parts together. The joint is then made permanent by welding with the oxy-acetylene outfit. The total cost of this work, using dissolved acetylene, averages 92 cents per pole.

The method as outlined above is, of course, used only on the large or main portion of the pole where by far the greater number of breaks occur. When the break is in the smaller portion a simpler reinforcement of iron pipe or a rod is used.

After welding the poles are equipped with new harps and wheels when required, and painted, and (as articles of this sort always "wind up") "they are as good as new." In the accompanying illustration is seen a pole in place in the press with the sections pressed about half-way together. A finished pole, showing clearly the appearance of the completed weld, is lying on top of the press, and a turned section of tubing, ready for insertion, is also lying on the press near the joint in the pole.

A new insulating material known as "galalith" has been produced in Germany, according to the U. S. Commercial report No. 238. This material is a bone-like substance manufactured from casein and formaldehyde. Galalith, which has a yellowish-white horn-like color, is said to be an excellent insulating material. It is workable either in the hot or cold state, the cold galalith being softened by treatment in hot water. It is odorless and much less inflammable than celluloid, but cannot be made into very thin sheets.

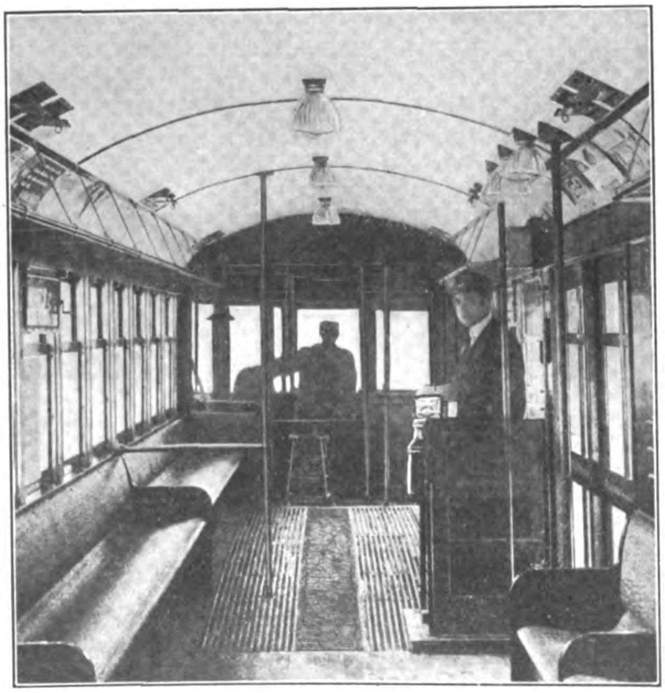
Front-Entrance, Center-Exit Cars for Syracuse

Twenty-five Cars of This Type Have Been Placed in Service on Two Important Lines and Have Given Very Satisfactory Results

Recently the New York State Railways has placed twenty-five Peter Witt front-entrance, center-exit cars in service in the city of Syracuse. Eighteen of the cars are in operation on a line that runs from the extreme northern section of the city on practically a level route, through the business district, to the extreme southern section. The average speed maintained on this line is 9.72 m.p.h., with an average number of stops per trip of forty-two in a run of 5.17 miles. Six of the remaining cars are in operation on a line that runs from a residential district, located on elevated ground, through the business section to another residential section, which also is on elevated land at the other side of the city. The grades range from 5 per cent to 9.12 per cent, and the average speed is 8.19 m.p.h., with an average number of stops per trip of thirty-three in a run 4.68 miles long.

The heaviest traffic point on each line is at its center, which is the business district of the city, and the greater portion of each line is double-tracked, wyes or loops being provided at either end. Of the twenty-five cars purchased to serve the two lines, one is normally held in the carhouse for emergency use.

The new cars consume approximately 30 per cent less power than those originally in use. With the new cars, too, the rate of acceleration has been increased to 2 m.p.h.p.s., which increases the time of free running. The equipment of each of the new cars consists of four 25-hp. Westinghouse Wee motors, with single-end control; whereas the equipment of the old cars consists of four 40-hp. motors. The new cars allow 18 in. per passenger and seat forty-eight, against forty-four for the other cars, giving a weight per seated passenger for the new cars of 600 lb., against 900 lb. for the others.



INTERIOR VIEW OF FRONT-ENTRANCE CENTER-EXIT CAR FOR SYRACUSE

The advantages of the new body design are reported to be that conflict of outgoing and incoming streams of passengers is impossible and that, because of the arrangement of the doors, the time consumed in fare collection is greatly reduced. Passengers enter by way of the front doors, which are double, passing into the car in a double stream, thus reducing by one-half the time that ordinarily would be taken in loading a single-entrance car, even if the conductor were not obliged to hold up the line to take fares. Besides the advantage of the double-entrance door, the location of the conductor at the center of the car effects another very material saving in time. Passengers pass half the length of the car before it is necessary for their progress to be checked by the collection of fares, and instead of the front platform alone serving as a space for boarding passengers who are waiting to pay their fares, the entire front half of the car serves this purpose.

CITY LINE
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NEW SYRACUSE CAR LOADING AT TRANSFER POINT

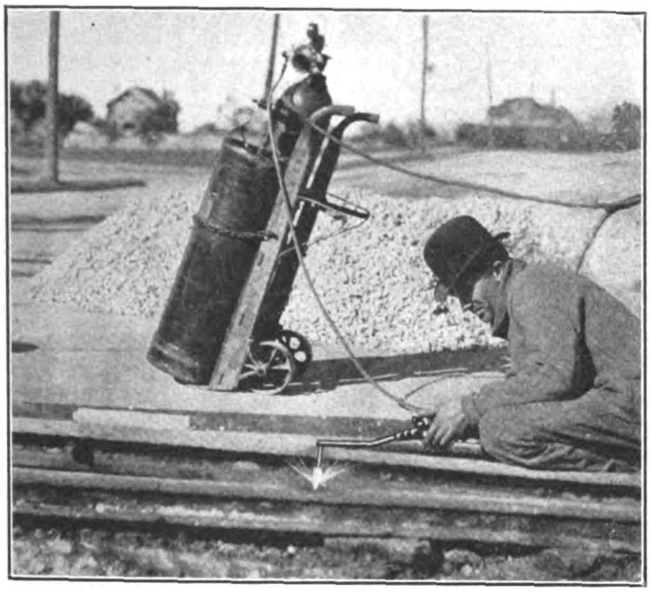
The entrance is protected by two folding doors. The center-exit doors are of the sliding type and are operated separately by means of a manual-pneumatic door engine built by the National Pneumatic Company, the levers for the control being located in front of the conductor's position. At the exit doors the steps are placed inside the car, thus doing away with the necessity of folding steps, and stanchions conveniently located serve as grab-handles, making the exit safe and easy.

The cars are built on all-steel underframes with a plate-steel girder. Angle side sills are used, bent down at the center on the step side for the low center-exit door and dropped at the front end for the entrance doors and the vestibule. The crossings are of channel, and the bolsters are of the built-up type with top and bottom plate spaced by spindles. U-shaped intermediate longitudinal members are used. The side posts are of the T-bar type.

The windows have stationary top sashes and bottom sashes arranged to raise. The roof is of the Brill arch type, with ventilators down each side and lights down the center of the car. At the motorman's end there is a Peter Smith heater, directly opposite the entrance doors. The windows are protected on the door side of the car with a five-bar guard, and on the closed side with a screen. The lighting system is laid out for five 94-watt units with one extra unit held in reserve, which can be cut into the circuit in case of failure, with a Nichols-Lintern selector switch.

Cutting Up Old Rail for Steel Ties

The San Antonio (Tex.) Traction Company is finding a more profitable use for its old steel rails than selling them for junk by cutting them into lengths suitable for use as steel ties underneath track construction. This is being done economically and rapidly by the use of acetylene gas supplied from a Prest-O-Lite outfit mounted on a hand truck. The old 60-lb. rails are temporarily bolted to improvized ties, cut off in the proper lengths and the necessary holes are quickly cut through. The time required to cut off a piece of 60-lb. rail is about thirty seconds, and the operator is making between 800 and 900 cuts in a nine-hour day.



GAS-CUTTING OUTFIT MOUNTED FOR WORK IN THE STORAGE YARD

Boiler Feed Water Softening Simplified

Calculation of the Proper Amounts of Treating Material Shortened by Use of Table

The instructions given in a recent A. S. M. E. paper by Arthur C. Scott and J. R. Bailey on the treatment of boiler feed water can be used readily by power station engineers. Suppose that the water analysis is as given by Table I:

TABLE I—SAMPLE WATER ANALYSIS

	Grams per liter
Sodium chloride	0.0744
Sodium sulphate	0.1110
Magnesium sulphate	0.3525
Calcium sulphate	0.4422
Calcium bicarbonate or Calcium carbonate	0.2535 0.1565

TABLE II—FACTORS FOR CALCULATING WATER-SOFTENING CHEMICALS

Salt	Soda-Ash Factor, Na_2CO_3	Factor, Lump Lime, (CaO)	Factor, Hydrated Lime, $Ca(OH)_2$
Sodium carbonate (Na_2CO_3)	....	0.529	0.699
Magnesium chloride ($MgCl_2$)	1.113	0.589	0.778
Magnesium sulphate ($MgSO_4$)	0.881	0.466	0.616
Magnesium bicarbonate ($Mg(HCO_3)_2$)	....	0.767	1.014
Magnesium carbonate ($MgCO_3$)	....	1.330	1.757
Calcium bicarbonate ($Ca(HCO_3)_2$)	....	0.346	0.457
Calcium carbonate ($CaCO_3$)	....	0.560	0.740
Calcium sulphate ($CaSO_4$)	0.779	....	....
Calcium chloride ($CaCl_2$)	0.955	....	....

TABLE III—GRAMS REQUIRED PER LITER OF HARD WATER

	Soda Ash	Lump Lime	Hydrated Lime
Sodium chloride	None	None	None
Sodium sulphate	None	None	None
Magnesium sulphate	0.3106	0.1643	0.2171
Calcium sulphate	0.3445	None	None
Calcium bicarbonate or Calcium carbonate	None	0.0877	0.1158
Total	0.6551	0.2520	0.3329

The grams per liter given by the analysis are multiplied by the corresponding multiplication factors given in Table II.

This gives the amount of softening chemicals required as shown in Table III. Either lump (unslacked) lime or hydrated lime can be used.

In either the slacked or unslacked form, however, lime has only about 70 per cent efficiency due to impurities and minor combinations, therefore slightly over 40 per cent more than calculated is necessary. Soda ash is about 90 per cent efficient, so about 11 per cent more than calculated is needed. In order to avoid the cost of tankage, which the use of clear lime water would entail, it is customary to use milk of lime. To express the results given in Table III in pounds per 1000 gal. of water it is only necessary to multiply by 8.347.

It was pointed out in the paper that the amount of scale-forming material may serve as a basis for classifying boiler waters. For instance, less than 8 grains per gallon represents very good water, 8 to 15 grains good, 15 to 20 fair, 20 to 30 poor, 30 to 40 bad, and over 40 very bad. Scale due to temporary hardness in water will deposit as a loose sludge that can be readily blown off. When the ratio of magnesium and calcium bicarbonate to other salts of these two elements is less than 4 to 1 the scale will be hard and very adhesive.

Home-Made Sanding Device Found Economical

Compressed Air Used to Operate Sander and to Clear the Pipes of Sand

On the interurban cars of the Pacific Northwest Traction Company, of which E. M. Swift is master mechanic, considerable difficulty has been experienced in getting car sand to run freely under all conditions. About two years ago a scheme was tried which has operated satisfactorily even in severely cold weather. It is very economical in the use of sand, and maintenance charges have been practically eliminated.

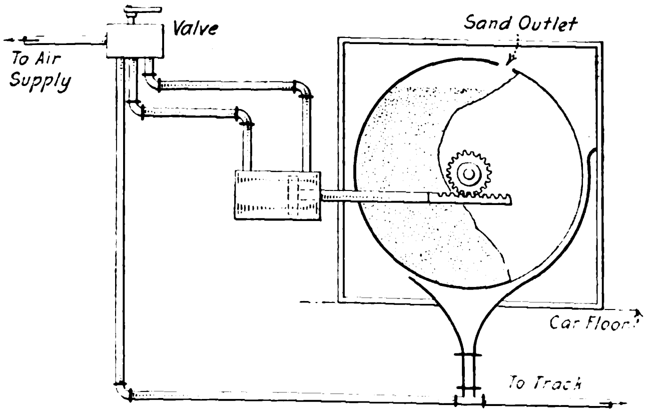


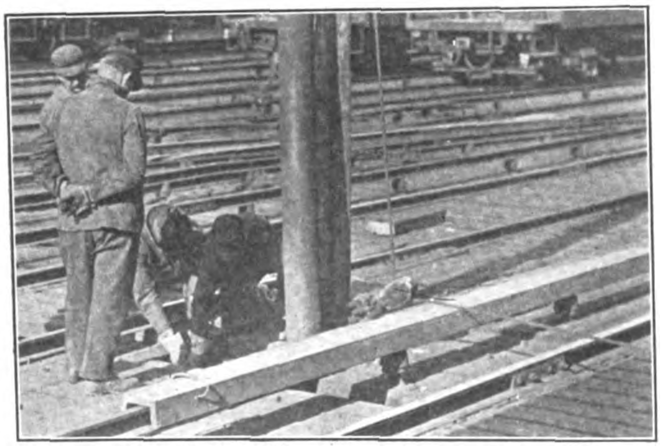
DIAGRAM SHOWING PRINCIPLE OF TRACK SANDER

The sand is contained in a cylindrical drum mounted on its axis in a box in the motorman's cab. The drum is rotated by a rack and pinion, actuated by a small air cylinder which has two ports connected to a three-position valve. Sand runs through a ½-in. round hole in the drum, so placed that it is normally at the top, as shown in the illustration. When air is admitted to the cylinder, the movement of the rack rotates the drum to a position so that sand can drop through the small hole into the outlet pipe which leads to the track. The sand is blown through this outlet pipe by air which is admitted with the valve in the next position. Upon closing the valve, air is first admitted to the cylinder through the reverse port, to rotate the drum back to its normal position, while air continues to flow through the outlet pipe. The motorman closes the valve when all the sand in the pipe has been blown out. The rotation of the drum agitates the sand, and if it is damp, permits the dry portion, which is normally at the upper surface, to run out first.

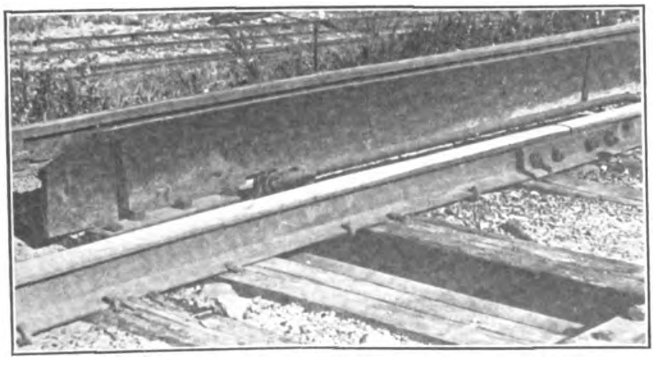
It is intended to procure patents on this sander and place it on the market in the near future.

Temporary Protection for Third-Rail

The accompanying illustrations show two types of third-rail protection used on the lines of the Brooklyn Rapid Transit Company to prevent workmen from coming in contact with the live rail. One consists of an inverted wooden trough dropped over the top of the rail. When trains are operating over the tracks the protection can be quickly removed by lifting it off with the rope handles. Another and more permanent protection consists of a 2-in. board erected between the third-rail and the running rail. This need not be removed to allow trains to pass, and it is often used at switch movements, signals, and walks where employees have to work close to the contact rail. While the board does not cover the top of the rail, it is high enough so that most tools will bridge from the board to the ground without making contact with the rail.



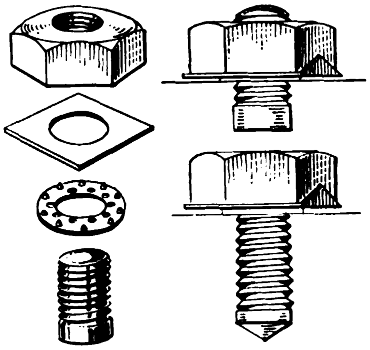
THIRD-RAIL TEMPORARILY PROTECTED BY WOODEN TROUGH



THIRD-RAIL PROTECTED BY BOARD AT THE SIDE

Lock Nut with Soft Metal Washer

The lock nut illustrated has lately been placed upon the market by F. R. Blair & Company, Inc., of New York. It is known as the "Loxon" lock nut and consists of three parts, a seating ring with sharp points on both sides, a square washer of soft metal, and a hexagonal nut, applied to the bolt in the order mentioned. When the nut or cap screw is tightened as far as it will go a corner of the square washer is bent up, firmly locking the nut. The points of the seating ring grip the soft metal washer on one side and the casting on the other when the nut is screwed down.

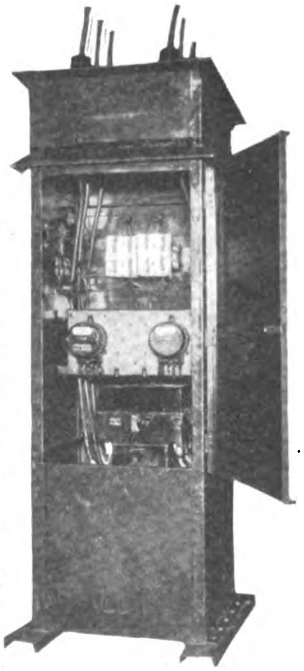


ASSEMBLY AND PARTS OF LOCK NUT

Outdoor Switch-Houses for Connecting Small Power Customers to Line

Many railways are increasing their incomes by selling electric power to small towns, manufacturing plants or mines located along the line of their tracks or adjacent to their transmission lines. The load is often not large enough to warrant the expense of a substation with indoor apparatus, and to meet this situation, portable switch houses have been built by the large electrical manufacturing companies, the one shown in the accompanying illustration being the product of the Westinghouse Electric & Manufacturing Company.

These switch houses are built in two forms, one for pole mounting and the other for ground mounting. They are constructed of steel throughout and are provided with a large door that gives easy access to the interior and that can be locked, thus protecting the apparatus from tampering by unauthorized persons. These houses are usually designed to contain an oil circuit-breaker, a watt-hour meter with current transformers, and voltage transformers, besides calibrating and testing terminals and the usual wiring. The switch houses are not expensive, and they are portable and can be readily conveyed to localities where needed. The standard sizes are made in capacities up to 600 amp. at 7500 volts, and all apparatus is fully protected from the weather.



INSIDE VIEW OF PORTABLE SWITCH-HOUSE

London Letter

Difficulty of Maintaining London Traffic—Birmingham Considering Underground Line—How the Recent Increase in Fares Has Worked

(From Our Regular Correspondent.)

The maintenance of London's traffic facilities is proving a difficult problem for the authorities in view of other pressing claims on the ever-shortening supply of available labor. The curtailment of the train services has thrown a further burden on the trams, and on many of the routes the strain is beginning to tell, especially during the rush hours. It is understood that every effort is being made to maintain the service at the highest possible level of efficiency, although the provision of drivers and the delay in the repair shops have reduced the number of cars that are available. Mr. Hume, chairman of the highways committee of the London County Council, has stated that the policy throughout has been to keep as many cars running as possible. Where a car was not run it was because there was no driver to take it out. The management had been treated considerately by the recruiting authorities, but had been required to part with more drivers recently and found it impossible to replace them. There was no foundation for the statement that trail cars had been taken off. It was possible, however, that cars had been taken off some routes and put on others that were more congested. The fact had to be taken into consideration that the routes to munition works received preference over others.

At a recent meeting of the tramways committee of the City Council of Birmingham the question of better tramway terminal facilities for the center of the city was under consideration. This subject was hinted at by the Lord Mayor on the previous day, when, at a gathering of the Rotary Club, he referred to the difficulty of the full development of the tramway system, owing to the lack of space in the center of the city for effecting an exchange between the various routes. He suggested the construction of subways along which cars of the tramway system could run for a certain distance. The committee discussed the matter of better terminal facilities from the point of view of surface and underground methods, and A. Baker, the general manager, was instructed to prepare a definite scheme for subways in the center of the city. When this scheme is ready it will be fully considered by the committee, and if it is approved by the members and by the City Council it will, doubtless, be one of the first progressive measures undertaken after the war.

Mr. Baker is fully qualified by experience to prepare the report. When he was engaged under the London County Council, before he went to Birmingham, Mr. Baker visited America to investigate the subway methods in certain of the principal cities of the United States. On his return he presented a report upon which the subway was constructed that extends from the Thames Embankment to Theobald's Road, passing under Aldwych and Kingsway. The question of assisting the city rates by a contribution from the profits was also considered. Figures were submitted, and on these the committee could not contemplate making any contribution owing to the loss of £50,000, sustained through the electric supply department failing to supply current sufficient for continuous running. The loss thus caused represented the amount which otherwise would probably have gone toward the relief of the rates.

The drastic changes in fares and services of the railways, which were ushered in with the new year, have, upon the whole, been received philosophically. The Underground Railways, exceptionally, has not raised its fares. This would indicate that the directors and management are satisfied with the present rate of increase in the receipts. The tubes are doing well, and the receipts on the omnibuses are expected to increase considerably, as a result of the new regulations introducing an increase of 50 per cent in the railway fares. It is understood that the daily receipts per bus have already risen to £6 10s., as compared with about £4 10s., prior to the war. A more extended reference to this increase in fares was contained in the ELECTRIC RAILWAY JOURNAL of Feb. 3, page 221.

The Corporation of Edinburgh has adopted a recommendation by its tramways committee to the effect that it should accept certain proposals submitted by the Edinburgh & District Tramways for the transfer of the undertaking to the city, and has remitted the matter back to the committee for adjustment and report. Thus, after a long period of consideration and discussion, the corporation has decided to purchase the whole system, and after the war is over extensive alterations and improvements will be inaugurated. At present a difficulty is that the terms on which the lease of the lines to the tramways company terminates, namely, June 30, 1919, were not laid down with sufficient clearness. The whole of the permanent part of the system—power stations, engines, and rails—belongs to the corporation, and cost altogether about £1,500,000, but the rolling stock is the property of the company. The lease does not suggest that the corporation should purchase the rolling stock, while the reports which have been submitted by experts recommend that the corporation should install in the city an overhead electric system at a fresh cost of about £600,000. The conversion of the system has, however, been prohibited by the government for the present. The proposals of the tramways company, now accepted by the Corporation, are that the city shall acquire the plant, including 200 cable-drawn cars, four electric cars, and fourteen single spare cable trucks, at a price of £50,000. All this plant will be useless if the reports of the experts are adopted and the cable system abolished, and thus £50,000 worth of plant will be rendered obsolete.

Owing to the congestion of traffic on the Glasgow tramway system at certain hours, the tramway committee of the Corporation has instructed the general manager to communicate with large employers of labor in the city to ascertain if some arrangement could be reached with regard to adjusting the meal hours and stopping time at public works, so that all the employees would not be released at the same hour. The committee has also decided to appeal to ladies who may be shopping in the city in the afternoon to make the homeward journey not later than 4 o'clock.

In view of the urgency of providing for additional supplies of power it has been decided by the Glasgow Corporation to proceed at once with the erection of the buildings in connection with the new power house at Dalmarnock. The City Council has obtained authority to raise another £500,000 for the projected extensions.

The City Council of Hull has agreed to the recommendations of the tramway committee to abolish the ½d. stages on the principal routes, and to substitute a 1d. flat rate, with a ½d. flat rate for non-commissioned officers and men of the Army and Navy, who, at present, on weekdays have free use of the cars.

At a special meeting of the Liverpool tramways and electric lighting committee to consider questions of account and matters affecting fares and stages, it was decided to vote £125,000 from the tramways receipts toward the relief of the rates, and £65,000 from the electrical undertaking for the same purpose. This constitutes a record and represents nearly a 1s. rate. Last year the tramways contributed £100,000 to the reduction of the rates. There is reason to believe that action will be taken shortly with regard to the suggested shortening of the tramway stages.

The electors of Ashton at a public meeting have authorized the corporation to proceed with a Parliamentary bill, which will give the Town Council power to purchase the undertaking of the Oldham, Ashton & Hyde Electric Tramway within the borough and in the adjoining villages of Waterloo and Bardsley. Power is also sought to construct connecting tramways at a cost of nearly £5,000, and to run a motor omnibus service.

Electrification has re-established the East London Railway as a popular means of communication between the north and south of the Thames, east of the city. Conclusive evidence that this is so is furnished by an increase of nearly 9 per cent in the number of passengers carried in 1916. The goods traffic, which is still worked by steam, was also heavy. As the East London's share in the general railway pool is allocated on the basis of its proportion to the whole prior to the war, it gets no appreciable benefit from the expansion of its traffic and from the expenditure on electrification. The government is being asked by the directors to make a special case of the East London by allowing a sum to recoup the company for any liabilities in connection with the electrification.

A. C. S.

News of Electric Railways

Traffic and Transportation

Financial and Corporate **Personal Mention** **Construction News**

$400,000 Improvement in Detroit

Detroit United Railway to Have New Track Storage Yard

The Detroit (Mich.) United Railway is making plans for a new storage yard for track materials to occupy a 21-acre tract of land on the Rouge River and West Fort Street. The present 9-acre yard at Harper and Mount Elliott Avenues will be turned over to the transportation department for use as an operating station for the new Grand Belt line which at present has no car station nearer than 2 miles from the line, resulting in a large dead mileage. The plans for buildings and equipment in the new storage yard have not been completed, but these will include the erection of an office building for the track department clerical force and superintendent, a car repair shop, machine shop, foundry, carpenter shop and stock room, sand drier, a stone crusher with 1600 tons a day capacity and other equipment. It is estimated that it will require more than $400,000 to carry the plans to completion.

The work of erecting the new stone crusher at the Rouge yards is now under way and some temporary buildings are being built so that the Harper yard may be partially vacated as soon as possible. A large part of the material to be used in track work this spring and summer is now being stored at the new yard and use of the Harper yard will be discontinued as rapidly as possible. The complete plans for the Rouge yard, however, may not be consummated for about two years.

The new location will give several advantages in the handling and storing of way materials, in addition to the increased space and new equipment, which are not now available at the present yard. Direct connection with the Michigan Central, Wabash and the Detroit, Monroe & Toledo Short Line railways will be had, and the company also plans to construct a receiving dock 1100 ft. long on the Rouge River. When completed this will possibly be the largest electric railway storage yard in the country.

Minneapolis Negotiations Progressing

The street railway franchise negotiations in Minneapolis are progressing, although at such an early stage in the matter the general public is naturally somewhat apathetic. The company has made proposals for a distribution of requested street railway extensions averaging 17 miles a year for three years, and 9 miles for the fourth year, making a total of 60 miles, on condition that a settlement is reached in the pending franchise negotiations. This building program has been offered as a broad and comprehensive development for the future transportation needs of Minneapolis, and the distribution has been made with regard to the expected needs of various parts of the city.

The City Council at its last meeting ordered the company to build about 7 miles of double track, and has now turned its attention to an active consideration of the franchise itself.

The city attorney has begun work drafting a franchise and is working in connection with the central franchise committee, which is composed of representatives from various civic organizations.

The officers of the company stand ready and willing to make a deal as favorable as possible to the city, which will at the same time protect the integrity of the outstanding securities of the company.

A digest of the proposal of the company to the city was published in the Electric Railway Journal of Dec. 16, 1916, page 1261.

Power Improvements in Kansas City

The Kansas City (Mo.) Railways has outlined a plan of improvements, following closely the suggestions of Edward N. Lake of the Krahbiel Company, Chicago, Ill., who made a survey several months ago. The chief changes are in the distribution of power. They involve abandonment of two substations this year, and a third later, and the establishment of five others at various locations this year and two more later. A portable automatic substation has already been ordered for delivery this summer.

The only equipment for the new substation to be bought now is a 3000-kw. rotary converter. Eventually, three 1500-kw. rotary converters, one 2000-kw., three 1000-kw., one 800-kw., one 600-kw. and four 750-kw. converters will be installed in the new substations. Some of the equipment will come from the stations abandoned. Under the plan outlined, the company will within a year have thirteen substations and twenty-eight converter units of a total capacity of 35,500 kw. Switchboard equipment is to be standardized so that units may be moved or replaced readily.

The new equipment is to be planned with the end in view of ultimately using automatic equipment, either through the purchase of automatic converters or the equipment of smaller units with automatic devices.

Extensive improvements are to be made at the power plant, and other places. Forty-three thousand dollars is to be spent on overhead lines. The total of expenditures is estimated at $370,000, including $100,000 for the power plant, $161,000 for the substations and $30,000 for the switch house. The company has more than twenty sizes of cables in use. This number will be reduced to four or five.

Hearing on Philadelphia Petition

The hearing before the Public Service Commission of Pennsylvania on the application of the city of Philadelphia for authority to construct the proposed high-speed lines was continued on Feb. 15. W. S. Twining, director of the department of city transit of Philadelphia, declared construction of the proposed comprehensive high-speed system to which the city is committed would cost between $90,000,000 and $91,000,000. This is approximately $28,000,000 more than was ever before officially anticipated. The director based his increased estimate upon the inflated prices of materials and labor. He asserted that were the city to attempt independent operation of the lines the cost would be increased to approximately $105,000,000. The lines could be equipped by the city for approximately $14,000,000. E. A. Ballard, counsel for the Philadelphia Rapid Transit Company, stated the case of the company as follows:

"I take it the city is committed to the construction of a comprehensive high-speed transit system, and if a fair agreement can be reached the greatest number of citizens will derive the greatest benefit from such a system. The terms of the Philadelphia Rapid Transit Company for leasing the lines will, if passed upon by Councils, eventually be placed before this commission. I take it the commission at present is considering the question of construction. The great problem is what shall be built. Shall the city undertake the expenditure of $100,000.000 with $63,000,000 on hand, looking at the future hopefully, or will it cut its coat to fit the cloth in hand and close its eyes to the future? Our position is that when and if the city builds the lines, we will operate them whether they are long or short lines, if the lease is ratified. When that question is placed before the commission I shall discuss it and shall answer some of the questions raised here to-day."

Cleveland Subway Considered

Resolution Adopted Calling Upon Subway Company to Show Why Its Franchise Should Continue

By unanimous vote the City Council of Cleveland, Ohio, on the evening of Feb. 19 adopted a resolution calling upon the Cleveland Rapid Transit Company to submit a report showing why its franchise should not be revoked. The resolution had been approved by the street railway committee. W. R. Hopkins, president of the company, was present at the committee hearing in the afternoon, and asked that the demand for a report be delayed. He said that if it had not been for the war, the underground railway which the company proposes to build would have been in operation, and that he will be disappointed if work is not begun this year.

Councilman Clayton C. Townes said the franchise should be revoked at once in order to clear the way for the construction of municipal subway terminals. Mr. Hopkins, however, pointed out that the city had as yet made no investigation of the proposition that has been discussed, and that its engineers do not yet understand the obstacles that will be encountered. He said that $10,000,000, the amount of money named, will hardly be sufficient to build terminals so extensive as contemplated.

The franchise to the Cleveland Rapid Transit Company was conditioned upon the company spending $500,000 in construction work within a stipulated period. It is contended now that this period has elapsed, thus giving the Council the right to revoke the grant whenever it sees fit. The matter will depend upon the report that is made and the possibilities of construction work being commenced within a reasonable time.

Cincinnati Agreement Likely

It is said that an agreement for the lease of the proposed rapid transit loop at Cincinnati, Ohio, to the Cincinnati Traction Company will be closed soon. Charles A. Groom, city solicitor, submitted a tentative draft of the lease on Feb. 20 to attorneys representing all the interests. It embodies all the proposals made to the company by the conference committee from the City Council and the Rapid Transit Commission, except the clause relating to the distribution of the earnings from the joint operation of the loop and the surface lines. As yet the city and company have not been able to agree on this point.

The tentative lease provides that the company shall surrender its present franchise for another franchise which will govern the joint operation of the loop and the surface lines, universal 5-cent fare and transfer by the shortest route, use of the interurban entrance by all interurban railways upon an equal and uniform contract basis, right of the city to regulate service and rates of fare, and the right of ordering the building of extensions, subject to the appeal of the company, and the right of the city to purchase the surface lines at a price to be established by agreement.

Cleveland Allowance Adjusted

At a conference between J. J. Stanley, president of the Cleveland (Ohio) Railway, and the street railway committee of the City Council on Feb. 24, an arrangement was made that will avert the threatened break on the question of operating allowance. In order to avoid arbitration, Mr. Stanley proposed a compromise figure of 14½ cents per car mile. He had asked for 15 cents. The committee and Street Railway Commissioner Sanders had insisted upon 14 cents, or an increase of one-half of 1 cent over the previous allowance.

It is estimated that this will cover the increase in wages which the motormen and conductors will receive, beginning on May 1, and provide for betterments in the service. Mr. Stanley stated that the increase in service will be about 7½ per cent. It is stated, however, that the increase should be 12 per cent in order to keep pace with the demands of traffic. The additions to the service during the last year were slight. For this reason they should be greater than ordinary this year.

The committee has agreed to the plan to charge off immediately $100,000 of the $195,000 operating deficit. The remaining $95,000 is to be charged off at the rate of $6,000 a month. The entire maintenance deficit of $268,000 is to be charged off at the rate of $10,000 a month.

Mr. Sanders and members of the committee expressed the belief that the settlement will not affect the rate of fare for the present, although it reduces the interest fund to $460,000. It does, however, increase very materially the amounts to be charged off monthly and would seem to place the company where it will be impossible to accumulate a surplus at the same rate that would have been possible had the deficits been made good in a lump sum.

$340,000 Grade Elimination

Last Grade Crossing in Electrified Zone on New York Central's Main Line to Go

Upon an opinion by Chairman Van Santvoord, the Public Service Commission for the Second District of New York has decided that the so-called "Village-Railroad" plan for the separation of the New York Central's main tracks from the street grades at Tarrytown should be adopted. The commission makes no order at this time, waiting for agreement to this decision by the railroad, the village and others interested. The cost of the project will be about $340,000.

The proceedings for this elimination had been pending before the commission and its predecessor for eleven years. Mr. Van Santvoord says that while the idea now adopted by the commission may not be an ideal plan, the circumstances make an ideal plan impossible. The commission now has funds which it can devote to this work and Mr. Van Santvoord says that unless the necessary agreements are immediately made for this plan, which he considers to be the best that can be devised, the work will again be put off, and the operation of four tracks of one of the country's greatest trunk lines through the streets of a prosperous and growing community will continue to be an increasing menace to safety and a hindrance to proper operation.

This is the last grade crossing to be eliminated in the electric zone of the New York Central's main line and Harlem division. The plan finally adopted is one which the chairman finds was submitted in 1911 and has been consistently favored by the municipality, the railroad corporation, the engineers of the commission and by a very considerable, if not actual, majority of the taxpayers and residents of Tarrytown.

I. R.T. Regales Employees' Ball Teams

Champions of Company Baseball League Receive Tribute from President Shonts, National League Executives and Prominent Railroad Men

Railway officials and employees were united by ties of genuine baseball enthusiasm on Feb. 28 when the Interborough Rapid Transit Company, New York, N. Y., with Theodore P. Shonts, president, as toastmaster, honored the members of the Interborough Baseball League, composed of five teams representing the different departments of the company, with a dinner at Reisenweber's restaurant. Amid the applause of about 200 who attended, the league pennant was presented to the champion team, composed of men from the car equipment department, and Harry Hempstead, president of the New York Giants, gave a loving cup to Fred Banker of the equipment department team as the best all-around player.

A warm introductory welcome by Mr. Shonts, who was himself an active devotee of the national game during his college years, was followed with speeches by John K. Tener, former governor of Pennsylvania, and now president of the National Baseball League; John B. Stanchfield, who related how he came to pitch the first curved ball; H. H. Vreeland, director of the Welfare League of the Interborough; F. B. Lincoln, general manager of the Erie Railroad; Patrick E. Crowley, vice-president of the New York Central Railroad; R. V. Massey, general superintendent of the Pennsylvania Railroad; W. J. Fripp, general manager of the New York Central Railroad; R. S. Parsons, chief engineer of the Erie Railroad, and John Whalen, former corporation counsel, and Daniel Brady, of the Brady Brass Company.

City to Answer St. Louis Company.—Announcement was made on Feb. 21 by the chairman that an answer by the city to the compromise proposed by the United Railways for the settlement of the mill tax and franchise problems would be considered on Feb. 28 at a meeting of the public utilities committee of the Board of Aldermen of St. Louis. Statistics from other cities, on which the answer and counter offer will be based, will be presented to the committee by C. E. Smith, consulting engineer of the committee.

Toledo Rental Question Considered.—The question of requiring the Toledo Railways & Light Company, Toledo, Ohio, to pay a rental of $185 a day for the use of the streets occupied by its tracks was considered by the street railway committee of the City Council on Feb. 21. Officers of the company were later notified to appear before the committee at the next meeting to show why the company should not pay such a rental. If the ordinance making this provision is passed, the money will be used in repairing the streets occupied by the tracks.

West Side Hearings Continued.—The Board of Estimate of New York City continued on Feb. 26 its public hearings on the plans and form of agreement for the track changes as decided upon between the New York Central Railroad for its west side line in the city. Mayor Mitchel has stated that full opportunity will be afforded for critics of the plan and form of agreement to be heard. The plans are to be re-studied by a board composed of experts who are members of architectural landscape societies, engineering societies and civic organizations. This new study is expected to occupy several months.

Trial of Commissioner Wood Postponed.—The case of Robert Colgate Wood, formerly a member of the Public Service Commission for the First District of New York, indicted on the charge of attempted bribery, which was set for trial on Feb. 26 before Judge Nott in General Sessions, was postponed until March 12 on application of Frank Moss, counsel for Mr. Wood. Mr. Wood was indicted as a result of testimony before the Thompson committee alleging that he had demanded $5,000 when he was Public Service Commissioner for his approval of the signal contracts for the new Center Street subway loop. In requesting the adjournment Mr. Moss said he had been ill and had not had time to prepare his client's case.

Executive Committee of Pacific Coast Association Meets.—The regular annual meeting of the executive committee of the Pacific Coast Electric Railway Claim Agents' Association was held in Portland, Ore., on Feb. 20, in the offices of Secretary-Treasurer B. F. Boynton, who is claim agent of the Portland Railway, Light & Power Company. The principal reports read at the convention were from the legislative, safety and subjects committees. The executive committee expressed itself as strongly in favor of uniform legislation, as well as a standardization of all safety first rules and regulations regarding accident prevention and traffic problems. It was decided by the committee to hold the annual convention of the association in Portland, Ore., on July 18, 19 and 20.

I. T. S. Not Subject to St. Louis Mill Tax.—The Board of Aldermen of St. Louis, Mo., will be advised by City Counselor Daues that in his opinion the Illinois Traction Company cannot be compelled to pay a mill tax on each passenger similar to that paid by the United Railways. This opinion will be in answer to a resolution introduced by Alderman Schwartz directing the city counselor to take legal steps to collect a mill tax from the line. The resolution was referred to the public utilities committee for an opinion as to the chance of winning such a mill tax suit. Mr. Daues will base his decision on an opinion written some time ago by former Associate City Counselor Truman Post Young, holding that the city has no power to levy such a license tax on an interurban company in interstate commerce traffic.

Fort Wayne & Northern Indiana Increases Wages.—Sam W. Greenland, general manager of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., recently announced that all motormen and conductors on both city and interurban lines would receive a voluntary increase in wages of 2 cents an hour, effective on March 1. The order affects 500 trainmen and the increase represents an additional outlay by the company of $40,000 a year. In Fort Wayne and other cities where the company operates the trainmen now receive from 21 cents to 25 cents an hour. Under the new schedule these men will receive from 23 cents to 27 cents. The interurban trainmen now receive from 22 cents to 29 cents an hour. Under the new scale the rate of pay of these men will be from 24 cents to 31 cents an hour.

Atlanta Dynamiter Sentenced.—L. E. Dodgen, formerly a lineman of the Georgia Railway & Power Company, Atlanta, Ga., was convicted on Feb. 15 in the Criminal Court of Atlanta on the charge that he participated in the dynamiting of one of the company's suburban cars while the street railway "strike" was in progress last fall. The explosion threw the car from the tracks and its momentum carried it against one of the trolley poles. The jury's verdict was returned with a recommendation to mercy, thus limiting to ten years imprisonment the maximum penalty the convicted man could receive. Dodgen was a member of the linemen's union and was one of those who abandoned their work in August, 1916. The failure of the linemen's strike led to an attempt by the leaders to force the company's trainmen into the Amalgamated Association. On Feb. 24 Dodgen was sentenced to serve eight years.

City Formally Rejects Payment.—The City Council of Seattle, Wash., on Feb. 19, directed Comptroller Harry W. Carroll to return to the Puget Sound Traction, Light & Power Company its check for $64,000, representing 2 per cent of its gross earnings for 1916, due to the city under the terms of its franchise. The company paid this sum on Jan. 15 last, with the express provision that in accepting it the city agreed not to begin suits to compel the compliance with franchise obligations, pending a hearing on the petition for relief filed by the company with the Public Service Commission about two years ago. By refusing to enter into any such agreement, and returning the check, the city places itself in a position to bring action against the company to recover the amount. No announcement has been made by the city officials as to whether any attempt will be made to further penalize the company for its failure to comply with the provision requiring the payment of 2 per cent of its gross earnings annually to the city.

Program of Association Meeting

Central Electric Railway Association

The program has been announced for the annual meeting of the Central Electric Railway Association to be held at the Claypool Hotel, Indianapolis, Ind., on March 8 and 9. The dinner for association members, their families and invited guests will be held on March 8 at 7 p. m. The president of the association will preside at the dinner as toastmaster and there will be short addresses by Charles A. Bookwalter and Joseph A. McGowan. The executive committee will meet on March 7 at 7.30 p. m.

The formal meeting of the association will be opened at 9 a. m. on March 8 with the annual address by President A. Benham. There will follow the presentation of a paper "Revival of Pure Wrought Iron for Railroad Service," by G. G. Roberts, engineer Brown & Company, Inc., Chicago. Following the discussion of this paper addresses will be made by the following past presidents of the association: E. C. Spring, H. A. Nicholl, F. D. Carpenter, George Whysall, E. B. Peck, W. S. Whitney, A. W. Brady, E. F. Schneider and C. L. Henry.

The session on March 9 will be opened by the consideration of business matters and the presentation of reports of committees. There will follow the presentation of a paper, "The Value of Standards to the Railway Industry," by A. L. Broomall, engineer of the railway department of the Westinghouse Electric & Manufacturing Company. Following the discussion of this paper the past presidents of the association previously mentioned and not heard at the session on March 8 will address the meeting. The session will be concluded with the presentation of the report of the secretary and treasurer and the election and installation of officers for the ensuing year. The new executive committee will meet immediately after adjournment.

Financial and Corporate

Wisconsin Companies Consolidate

Public Utility Companies in Fond du Lac United with Sheboygan Electric Company

Kelsey, Brewer & Company, Grand Rapids, Mich., have acquired the properties owned and controlled by the Eastern Wisconsin Railway & Light Company and the Wisconsin Electric Railway. The purchase includes electric and gas plants at Fond du Lac, Wis., the local street railway in Fond du Lac and an interurban line from Fond du Lac to Neenah, Wis., via Oshkosh with a branch from Oshkosh to Omro, Wis.

These properties are being consolidated with those of the Sheboygan Electric Company as the Eastern Wisconsin Electric Company. Articles of incorporation of this company were filed on Feb. 21 with the Secretary of State at Madison, Wis. The authorized capitalization is $5,000,000 of common stock, $5,000,000 of preferred stock and $20.000,000 of bonds.

The combined properties will have approximately 7800 electric consumers and 3500 gas consumers. The annual sales of electric current are more than 10,000,000 kw.-hr. Gas sales amount to 90,000,000 cu. ft. The company has approximately 102 miles of local and interurban railway. All franchises have been surrendered and the company is operating its properties under an indeterminate permit granted by the Railroad Commission of Wisconsin.

The officers of the new company are Joseph H. Brewer, Grand Rapids, president; Raymond H. Smith, Sheboygan, vice-president; Willis J. Ripley, Grand Rapids, treasurer; Blaine Gavett, Grand Rapids, secretary. No changes in the local managements are contemplated at this time.

Consolidation on Staten Island

Richmond Light & Railroad Company and Staten Island Midland Railway Seek to Consolidate

The Richmond Light & Railroad Company and the Staten Island Midland Railway have filed a petition with the Public Service Commission for the First District of New York, asking for permission to consolidate the two companies under the name of the Staten Island Light & Traction Company, Inc. The Staten Island Midland Railway is engaged exclusively in the railroad business, while the Richmond Light & Railroad Company not only operates a railroad, but is also engaged in the electric light and power business. In their petition the companies say that they entered into a joint agreement on Dec. 1, 1916, to consolidate their interests.

The Richmond Light & Railroad Company asks for authority to execute a mortgage and deed of trust to secure $7,500,000 face value of first and refunding mortgage 6 per cent gold bonds by the consolidated corporation, and to permit it to issue $1,350,000 par value of 6 per cent cumulative preferred stock and $3,291,000 par value of common stock. The application of the Staten Island Midland Railway is for about the same privileges, and asks, in addition, for authority to increase the capital stock of the company from 10,000 shares, par value $100, amounting to $1,000,000, to 23,500 shares, par value $100, amounting to $2,350,000.

The petition sets forth that it is proposed upon the consummation of the consolidation that the new company shall increase its authorized capital to $15,000,000 par value, divided half and half between common and preferred stock. This proposed increase is only to be issued as the corporate needs of the company require. Under the proposed new mortgage for $7,500,000 face value of 6 per cent bonds, which has been consented to by the majority of stockholders of the two companies, it is proposed to issue $1,730,000 immediately upon the consummation of the consolidation, and to issue the remaining $5,770,000 as the needs of the new company demand.

Annual Report

Twin City Rapid Transit Company

The comparative income statement of the Twin City Rapid Transit Company, Minneapolis, Minn., for the calendar years 1915 and 1916 follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Revenue from transportation	$10,130,113	99.5	$9,401,233	99.5
Revenue from other railway operation	57,941	0.5	52,731	0.5
Total railway operating revenue	$10,188,054	100.0	$9,453,964	100.0
Way and structures	$1,057,235	10.4	$995,556	10.5
Equipment	780,235	7.7	728,085	7.7
Power	880,081	8.6	839,673	8.8
Conducting transportation	2,725,761	26.8	2,582,226	27.3
Traffic	45,550	0.4	49,297	0.5
General and miscellaneous	808,472	7.9	909,295	9.6
Transportation for investment—credit	—42,691	0.4	—39,504	0.4
Total railway operating expenses	$6,254,643	61.4	$6,064,628	64.1
Net operating revenue	$3,933,411	38.6	$3,389,336	35.9
Taxes assignable to railway operation	708,098	6.9	687,454	7.3
Operating income	$3,225,313	31.7	$2,701,882	28.6
Income from unfunded securities and accounts	$26,051	0.2	$23,658	0.2
Miscellaneous income	374	0.0	269	0.0
Total non-operating income	$26,425	0.2	$23,927	0.2
Gross income	$3,251,738	31.9	$2,725,809	28.8
Rent for leased roads	$3,000	0.0	$3,000	0.0
Interest on funded debt	984,557	9.7	989,843	10.5
Net loss on miscellaneous physical property	18,622	0.2	12,443	0.1
Miscellaneous debits	8,011	0.1	8,248	0.1
Total deductions	$1,014,190	10.0	$1,013,534	10.7
Net income	$2,237,548	21.9	$1,712,275	18.1

The last calendar year was a prosperous one for the company. The total railway operating revenue showed an increase of $734,090, or 7.7 per cent, most of this arising from the gain of $728,880, or 7.7 per cent, in revenue from transportation. The operating expenses increased only $190,015, or 3.1 per cent, so that the net operating revenue rose $544,075, or 16.0 per cent. In the operating expense group increases were shown for maintenance of way and structures, maintenance of equipment, power and conducting transportation, while traffic and general and miscellaneous showed decreases.

Taxes assignable to railway operation rose $20,644, or about 3 per cent, while non-operating income increased slightly, and deductions from income to a less extent. As a result, the net income for the year showed a gain of $525,273, or about 30 per cent. Regular quarterly dividends at the rate of 7 per cent on the preferred stock and 6 per cent on the common stock, aggregating $1,530,000, were declared and paid in 1916, and after an appropriation of $100,000 to miscellaneous reserves a balance of $1,368,762 was carried forward for the year.

The revenue passengers carried in 1916 totaled 199,848,096, as compared to 185,654,985 in 1915, while the transfers redeemed in the two years were 74,425,935 and 69,259,767 respectively. The ratio of operating expenses and taxes to revenue was 68.17 per cent in 1915 and 71.24 per cent in the year preceding.

During 1916 4.32 miles of track were constructed and put in operation, as follows: Minneapolis, 2.88; St. Paul, 0.90, and suburban, 0.54. The construction of sixty-three cars was authorized, but on account of slowness in delivery of motor equipments, some of these cars are not yet in service but will be at an early date.

Negotiations for the purpose of adjusting the franchise relations of the Minneapolis Street Railway with the city made progress, the greater part of 1916 having been devoted to making valuations of the company's property. The city met the company fairly, the annual report states, and the directors are hopeful that a mutually satisfactory contract will be agreed upon. The officers will proceed with these negotiations as rapidly as practicable.

Formal Empire United Plan

Committee Issues Reorganization Plan—Details for Raising Cash and Exchanging Securities

Under date of Feb. 24 the committee composed of Thomas W. Meachem, Ralph S. Bowen and William A. Mackenzie, acting under the deposit agreement dated Nov. 18, 1915, presented the formal plan for the reorganization of the properties of the Empire United Railways, Inc., Syracuse, N. Y. A preliminary announcement of this plan was made in the ELECTRIC RAILWAY JOURNAL of Feb. 17.

NEW CORPORATION TO BE FORMED

In the event that the property of the Empire United Railways, Inc., when sold at foreclosure, is acquired by the committee, a new company is to be organized under laws of New York. This company shall be subject to existing securities composed of $2,500,000 of first mortgage 5 per cent bonds of the Syracuse, Lake Shore & Northern Railroad and $250,000 of first mortgage 5 per cent bonds of the Auburn & Northern Electric Railroad. New securities will consist of $500,000 of three year 6 per cent secured promissory notes of the new company; $1,000,000 of 6 per cent cumulative preferred stock, Series A; $1,250,000 of 6 per cent non-cumulative preferred stock, Series B (to rank equally with or be convertible into Series A stock after Series B stock has received five consecutive dividends at 6 per cent), and $1,500,000 of common stock. The new securities shall be subject to the approval of the Public Service Commission, and any reductions made therein shall be taken as far as possible from the issue of Series A preferred stock.

CASH REQUIREMENTS

The estimated cash requirements under the plan total $599,300. This sum is made up as follows: Amount necessary to pay defaulted coupons on the Lake Shore bonds, $125,000; amount necessary to pay interest and various expenses in connection therewith, $37,500; amount necessary to pay defaulted coupons on the first-mortgage bonds of the Auburn & Northern Electric Railroad and interest, $13,100; compensation to be paid the managers, Ford, Bacon & Davis, for their agreement to hold themselves in readiness up to July 1, 1917, to purchase or procure the purchase of $350,000 of the three-year notes, $15,000; organization expenses, $17,500; real estate mortgage, $20,750; car trust obligations, $45,450, and foreclosure expenses, rehabilitation costs, new construction, improvements, working capital, etc., $350,000.

The cash requirements of the plan are to be met from the proceeds of three-year notes of the new company, the Series A preferred stock and the funds in the hands of the receivers in the Empire United foreclosure and dissolution proceedings. The cash requirements stated above are merely estimates, and the committee is to have the power if necessary to increase or diminish the amount of three-year notes and Series A preferred stock that may be sold but without varying the consideration or terms of sale.

DIVISION OF NEW SECURITIES

Upon the acquisition by the new company of the properties from the committee, the new company shall issue to the committee as consideration the following securities: Promissory notes, $350,000; Series A preferred stock, $700,000; Series B preferred stock, $1,250,000, and common stock, $1,500,000. The promissory notes will be sold (or as many thereof as may be determined) to the managers at 95. In the case of the Series A preferred stock the committee shall have the right to sell as much of the issue as it may dispose of at 75 (with additional Series B preferred stock and common stock as provided). The balance of the Series A preferred stock shall be held or placed subject to the two-year option of the managers to purchase ex-dividend at the date of purchase at 70. Of the Series B preferred stock $250,000 is to be transferred to the managers in part consideration for their agreement to stand ready to purchase the three-year notes and for their services in connection with the plan. The balance of $1,000,000 shall be held by the committee for use and for distribution among the depositors as hereafter provided. A total of $500,000 of the $1,500,000 of common stock to be transferred by the committee to the managers as further consideration as above, and the remaining $1,000,000 shall be held by the committee for use and for distribution as provided.

DISPOSITION OF SECURITIES TO DEPOSITORS

Each depositor of a $1,000 Empire United bond who shall on or before March 27, 1917, subscribe to a $50 assessment, shall receive $66.66 in Series A preferred stock, $625 in Series B preferred stock and $450 in common stock, a total of $1,141.66. Each depositor not paying the assessment shall receive $550 in Series B preferred stock and $400 in common stock, a total of $950. The assessment may be underwritten by any person or persons satisfactory to the committee. To each holder of unsecured notes or indebtedness the committee may give the privilege of subscribing $170 for each $1,000 of such indebtedness, in which event he shall be entitled to $226.66 of Series A preferred stock, $200 of Series B preferred stock and $500 of common stock. The same time limit applies for subscriptions in this case.

The Series B preferred stock and the common stock shall be placed by the committee in a voting trust for five years with three voting trustees, one of whom is to be named by the committee, one named by Ford, Bacon & Davis, and the third nominated by Ford, Bacon & Davis and approved by the committee.

Income Bond Interest Passed

Hudson & Manhattan Railroad Increases Its Cash Reserves by $340,000

Wilbur C. Fisk, president of the Hudson & Manhattan Railroad, New York, N. Y., has advised the holders of $33,102,000 of the company's adjustment income bonds that no distribution of interest on these securities will be made on April 1. It is explained that on account of the higher cost of labor, fuel and supplies the expenses have increased, and that a survey of the corporation's affairs made by Stone & Webster disclosed that weakness in the present position lay in the lack of an adequate cash reserve. For these reasons the directors determined to appropriate $340,000 to the reserve account. This appropriation wipes out the surplus earnings for the period ended Dec. 31, 1916, and makes it impossible for the company to pay interest on the adjustment income bonds.

In their report Stone & Webster said:

"We are of the opinion that the properties are in a high state of efficiency and maintenance, and that the method of operation is excellent; we find that the gross earnings of the company, even though slowly, have been steadily growing, and for the year ended Dec. 31, 1916, were the largest in the history of the company; that while on account of additional cost of labor, fuel, etc., expenses have increased, the net earnings have also shown an increase as large as should be expected under such circumstances.

"We find that the weakness in your present position is the lack of an adequate cash reserve. In our opinion, appropriations should be made to this reserve until a balance of at least $1,000,000 is reached, even though this will necessitate the temporary cessation of payment of interest on the company's adjustment income bonds."

The financial report of the company for the year 1916 shows gross revenues of $5,908,348, and operating expenses and taxes of $2,766,269, leaving a gross income of $3,142,079, which is a increase of $119,184, compared with the previous year. The net income applicable to bond interest for the year 1916 was $2,877,536. Deducting the interest payments on the New York & New Jersey 5 per cent bonds, and on the first lien 5s and first mortgage 4½s, a distribution to income bondholders for the first half year, and an appropriation of $390,000 as reserves for contingencies ($50,000 first half; $340,000 second half) left a balance of $51,358.

Under the provisions of the adjustment income bond issue no interest is due and payable except when and as declared by the directors out of available surplus. The bonds bear 5 per cent interest, which is non-cumulative until Jan. 1, 1920. For the eleven months of 1913, and for the years 1914 and 1915, 2 per cent per annum was paid. For the six months ended June 30, 1916, the company paid the same rate, the distribution amounting to $331,020.

Cities Service Stock Increase

Increase in Authorized Issues of Both Common and Preferred to Be Voted Upon on April 3

The annual meeting of the stockholders of Cities Service Company will be held on April 3. In addition to the usual routine matters, stockholders will be asked to ratify the resolutions made by the board of directors on Oct. 5, 1916, reading in part as follows:

"Resolved, That until such time as there has been invested in the property of Cities Service Company or its subsidiaries from the earnings of the company, a sum equal to the entire par value of the preferred stock then outstanding, no dividends shall be paid in cash on the common stock in excess of 6 per cent per annum, unless the company shall for a period of six months have purchased and retired all preferred stock that can be purchased in the open market at 110 per cent of par or less; and be it

"Further Resolved, That until the foregoing has been complied with, no surplus, or portion of surplus, created by an increase due to the re-valuation of assets already carried on the books, may be used as a basis for the distribution of cash dividends on the common stock."

A proposition will also be presented to increase the authorized amount of the company's stocks. The present amount of preferred stock in the hands of the public, $57,772,776, is very near the limit of the amount authorized, namely, $60,000,000. When during the ensuing year the company may find it desirable to expand even moderately, there would be no method by which this could be accomplished without the necessity of calling a special stockholders' meeting for the purpose. Accordingly the stockholders will be asked to approve the increasing of the preferred stock limit from $60,000,000 to $100,000,000, and the common from $40,000,000 to $50,000,000.

Another Portland Conversion Plan

Owners of Common Stock May Exchange One Quarter of Holdings for First and Second Preferred by Paying Twenty-five Dollars a Share

Through a plan just made public, the stockholders of the Portland Railway, Light & Power Company, Portland, Ore., will have the privilege of converting part of their common stock into preferred stock, thereby producing a fund of $1,250,000, which will be sufficient to take care of existing requirements for construction purposes and floating indebtedness. There will remain $1,000,000 to be applied on the company's note issue of $5,000,000, maturing on May 1. Another extension of the notes will then be granted by the holders, who are large owners of the stock.

The plan presented by the directors is to give all shareholders of record of Feb. 1 the privilege of converting one-fourth of their present 75 per cent paid common stock, amounting in par value to $5,000,000, into an equal amount of fully paid preferred stock, upon payment of $25 a share for the stock so converted. Half of the new issue of stock will be first preferred and half second preferred, both entitled to 6 per cent dividends. The first preferred dividend will be cumulative from April 1 of this year, but the second preferred dividend will be non-cumulative.

In July, 1915, through conversion of $5,000,000 of 75 per cent paid common stock, with $25 a share accompanying, an equal amount of 6 per cent preferred stock similar to that now proposed to be issued was distributed to shareholders. With the consummation of the plan now proposed, the company's capitalization will be $15,000,000 of 75 per cent paid common stock; $5,000,000 of 6 per cent fully-paid cumulative first preferred stock and a like amount of 6 per cent fully-paid non-cumulative second preferred stock. No increase will be made in the total amount of stock.

Dividends on the outstanding $2,500,000 of 6 per cent first preferred stock, accumulated but unpaid up to April 1, amount to $187,500. When these have been paid the two issues of first preferred will be similar in all respects. The issues of second preferred non-cumulative stock will take equal rank.

According to the official announcement, this is not to be regarded as an assessment on the common stock. Those who do not participate in the conversion may retain their holdings undisturbed. It is reported that the conversion plan has been underwritten by a syndicate of Eastern stockholders.

In the circular issued to stockholders, it is stated that general business conditions in Portland and Oregon have been improving steadily for some time. Earnings of the company have been increasing for several months, and prospects are reported excellent for continued increase and for results more satisfactory to stockholders than those secured in the last few years.

Foreclosure Sale Confirmed

Court Sanctions Disposal of Syracuse Suburban Lines to Representatives of Bondholders

Justice Irving G. Hubbs has confirmed the sale on Nov. 1 of the Syracuse & South Bay Electric Railroad and the Syracuse, Watertown & St. Lawrence River Railroad, under foreclosure to Attorney Ernest I. Edgcomb, representing the reorganization committee that was acting for the bondholders of the lines.

The reports of the referees named by Judge William S. Andrews a year before his designation to the Court of Appeals were submitted about three months ago. No action was taken by Judge Andrews and the reports passed with the many other details of the reorganization to Justice Hubbs.

The terms of purchase which received the official approval of Justice Hubbs provide in the South Bay sale that Mr. Edgcomb may pay in the bonds of the company not exceeding $188,000 of the purchase price of $201,000. This is to be figured at the distributive value of the bonds in case the entire amount had been paid in cash.

Justice Hubbs permits Mr. Edgcomb to turn in bonds worth $31,000 on the same distributive basis as the bulk of the purchase price of $35,000 bid for the Syracuse, Watertown & St. Lawrence River Railroad.

The plans of reorganization provide that the present holders of first mortgage bonds of the Syracuse & South Bay Road will receive a $300 5 per cent mortgage bond and $600 in new first preferred stock for each $1,000 bond held. In the Syracuse, Watertown & St. Lawrence River Road arrangements, present first mortgage bondholders will receive a $200 5 per cent mortgage bond and $475 of first preferred stock for each $1,000 held. Holders of other securities will receive an equal amount of second preferred stock for those held. Holders of present first preferred stock of the South Bay line will receive new common stock equal in value to 50 per cent of their old stock. Through this procedure the common stock of both roads previously outstanding will be eliminated. The amount of bonds hitherto outstanding will be reduced from $375,000 to $205,000. In order to meet the current expenses and the cost of the receivership, a $50,000 first lien note issue is proposed. A table showing the basis of exchange of the securities was published in the ELECTRIC RAILWAY JOURNAL of Aug. 19, 1916, page 333.

Lehigh Consolidation Progressing

Majority Interests in Transit Company Disclose Price at Which They Will Sell Holdings

Brown Brothers & Company, New York, N. Y., and Edward B. Smith & Company, Philadelphia, Pa., have addressed a circular to the holders of the common and the preferred stocks of the Lehigh Valley Transit Company, Allentown, Pa., in which they say in substance:

"The owners of more than a majority of the capital stock of the Lehigh Valley Transit Company, including the undersigned, have entered into a conditional agreement dated Feb. 7, 1917, to sell all of the stock so held by them at the following prices in cash: $28 for each share of common stock and $48 for each share of preferred stock. Accordingly they have agreed to deposit the certificates for this stock, with power of attorney to transfer, with the Girard Trust Company, Philadelphia, to be held by the trust company while the purchasers are making investigations with respect to Lehigh Valley Transit Company and certain other matters involved.

"We have associated ourselves with the purchasers in financing the acquisition of these and other securities, and we expect to share with them in an underwriters' profit in the transaction. We believe that the price at which we have agreed to sell our stock is advantageous and we have stipulated that all other holders of common and preferred stock of the Lehigh Valley Transit Company may deposit their stock, and, if the agreement is consummated, receive the same price for their stock as is to be paid for the stock that we own.

"The following have also agreed to deposit their stock upon the terms and conditions above stated: Charles H. Bean & Company, H. J. Steele, W. A. Wilbur, Lewis A. Riley, Chester Snyder, H. R. Fehr, Estate of Harry C. Francis, Estate of William F. Harrity, Harry C. Trexler, E. M. Young, S. M. Curwen and Thomas G. Ashton."

The stock of the company of both classes is of $50 par value. The deposit is asked in connection with the plan referred to previously in the ELECTRIC RAILWAY JOURNAL of consolidating the Lehigh Navigation Electric Company and the Lehigh Valley Transit Company.

Birmingham Railway, Light & Power Company, Birmingham, Ala.—The Federal Court has denied the petition of the city of Birmingham asking the court to enjoin the absorption of the Bessemer, Ensley & Birmingham Railway by the Birmingham Railway, Light & Power Company. The decision of the court will enable the litigation connected with the receivership and reorganization of the Bessemer, Ensley & Bessemer Railway to be concluded and the plans of the reorganization committee carried out. As noted in the ELECTRIC RAILWAY JOURNAL for Feb. 3, page 225, the Supreme Court of Alabama recently decided that the Alabama Public Service Commission was within its jurisdiction in ruling that the merger was consistent with the public interest.

Bryan & College Interurban Railway, Bryan, Tex.—A proposition for the organization of a company at Bryan for purchasing the Bryan & College Interurban Railway, the Bryan lighting and water system and the Bryan Power Company, with a view to consolidating these utilities and enlarging the power plant to supply power for the various industries in Bryan and College Station, has been made to the City Council of Bryan.

Georgia Railway & Power Company, Atlanta, Ga.—All of the outstanding $350,000 of refunding mortgage gold bonds of the Savannah River Power Company have been called for payment at par and interest at the office of the Columbia Trust Company, New York, N. Y., on April 1.

Illinois Traction Company, Peoria, Ill.—The property of the Galva Electric Light Company, Galva, Ill., has been purchased by the Illinois Traction Company. Stone & Webster, Boston, Mass., are offering for subscription at 96 and interest a block of first mortgage 5 per cent gold bonds of the Madison County Light & Power Company, controlled by the Illinois Traction Company, which has guaranteed the bonds as to principal and interest. The bonds are dated 1906, and are due in 1936. The Illinois Traction Company has purchased the properties of the North Missouri Light & Power Company, organized a little more than two years ago to obtain current from the Keokuk power plant and light New London, Center, Perry and Frankford. The purchase price of the property is said to have been $60,000.

Interborough Rapid Transit Company, New York, N. Y.—A public hearing will be held by the New York Public Service Commission, First District, on March 8 on the application of the Interborough Rapid Transit Company for permission to issue $16,436,000 of 5 per cent bonds under its first and refunding mortgage of $300,000,000 entered into on March 20, 1913. The present issue is contemplated in connection with third-tracking and other work upon the lines of the Manhattan elevated system and has been necessitated in part by the increased cost of materials and additional expenses due to high prices incurred in the prosecution of the elevated third-tracking, extension and improvement work.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—C. E. Denison & Company, Cleveland, Ohio, are offering at 101 and interest $200,000 of first-mortgage 6-per cent bonds of the Kansas City, Kaw Valley & Western Railway dated 1914 and due on Aug. 1, 1924, but callable at 101 and interest.

Louisville (Ky.) Railway.—The 1916 report of the Louisville Railway presented at the annual meeting on Feb. 21 showed satisfactory conditions. The gross earnings for the year on the city and country lines amounted to $3,630,077, and operating expenses and maintenance totaled $2,992,471, leaving net earnings of $637,606. Earnings showed an improvement over those under the depression of 1915, in spite of the heavy advances in cost of all materials and supplies. A new line to Shawness Park was put in operation on June 1 by the company and other track improvements were made.

New York (N. Y.) Railways.—The New York Railways has passed the interest usually paid on April 1 on the $30,626,977 of adjustment mortgage 5 per cent income bonds.

Republic Railway & Light Company, New York, N. Y.—At a meeting of the stockholders of the Republic Railway & Light Company, W. M. Coleman, who has been general counsel for the company, was elected a director to fill a vacancy. The other directors were all re-elected by the stockholders.

St. John (N. B.) Railway.—The shareholders of the St. John Railway have approved the offer of $140 a share net made to them by the New Brunswick Investment Company, Ltd., for their holdings. The St. John Railway has $1,000,000 of stock outstanding. The purchase offer was referred to in the ELECTRIC RAILWAY JOURNAL of Feb. 10, 1917, page 268.

West Penn Traction & Water Power Company, Pittsburgh, Pa.—The West Penn Traction & Water Power Company has resumed dividends on the preferred stock, declaring 1½ per cent on that issue covering the quarter ended Dec. 31. This is the first dividend since March, 1914.

Dividends Declared

Central Mississippi Valley Electric Properties, Keokuk, Iowa, quarterly, 1½ per cent, preferred.

Northern Ohio Traction & Light Company, Akron, Ohio, quarterly, 1¼ per cent, common.

Rochester Railway & Light Company, Rochester, N. Y., quarterly, 1¼ per cent, preferred.

Terre Haute Traction & Light Company, Terre Haute, Ind., 3 per cent, preferred.

Washington Railway & Electric Company, Washington, D. C., quarterly, 1¼ per cent, preferred; quarterly, 1¾ per cent, common.

Electric Railway Monthly Earnings

ATLANTIC SHORE RAILWAY, SANFORD, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan., '17	$22,902	*$24,642	†$1,740	......	......
1 " " '16	23,287	*19,916	3,371	......	......

CITIES SERVICE COMPANY, NEW YORK, N. Y.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan., '17	$1,854,449	$21,729	$1,832,720	$297	$1,832,423
1 " " '16	663,543	18,215	645,328	42,966	602,362
12 " " '17	11,301,249	242,904	11,058,345	216,291	10,842,054
12 " " '16	4,717,443	178,143	4,539,300	492,132	4,047,168

LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '16	$149,815	*$97,916	$51,899	$36,558	$15,341
1 " " '15	123,811	*76,891	46,920	36,095	10,825
12 " " '16	1,618,551	*1,022,712	595,839	436,647	159,192
12 " " '15	1,387,143	*898,136	489,007	433,203	55,804

REPUBLIC RAILWAY & LIGHT COMPANY,
YOUNGSTOWN, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '16	$373,412	*$214,071	$159,341	$81,746	‡$82,274
1 " " '15	320,869	*167,891	152,978	70,782	‡82,158
12 " " '16	3,987,616	*2,327,407	1,660,209	827,569	‡853,606
12 " " '15	3,121,296	*1,874,082	1,247,214	688,952	‡560,014

TWIN CITY RAPID TRANSIT COMPANY,
MINNEAPOLIS, MINN.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan., '17	$897,932	$612,161	$285,771	$149,363	$136,408
1 " " '16	830,283	513,199	287,084	145,952	141,132

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

Rehearing Asked in Fare Case

City of Los Angeles Asks Railroad Commission to Reconsider Its Decision in Suburban Fare Ruling

The city of Los Angeles, Cal., through its Board of Public Utilities, threatens to compel the Pacific Electric Railway to remove its cars from the city's streets unless the 5-cent rate is extended to Bairdstown, approximately 6 miles east of the business section; Palms, about 8 miles southwest of the business section, and to a number of other outlying sections, all of which have been made a part of the city within the last three years. The State Railroad Commission recently rejected the city's application for 5-cent fares in these cases on the ground that the Pacific Electric Railroad is already operating at a loss and that it would not be fair to compel the company to suffer further loss.

The latest chapter in the controversy is the action of the city attorney, upon the request of the Board of Public Utilities, in filing an application for a rehearing before the State Railroad Commission. In making this request of the city attorney the board asserted that the losses the railway set up before the commission in the statement of its general financial condition are entirely due to conditions outside the city and over which the city has no control. The local board maintains that any discussion of the financial condition of the company is outside the 5-cent fare case because only 8 per cent of the mileage of the Pacific Electric Railway is within the city while 92 per cent is outside of the city. The Board of Public Utilities of Los Angeles concluded its statement as follows:

STATEMENT OF BOARD

"In view of the Railroad Commission's opinion that the Pacific Electric Railway was an entirely interurban system, the city is forced to take under consideration the advisability of having the Pacific Electric Railway stop all its interurban cars at every crossing, either for the entrance or discharge of passengers, until such time as the Pacific Electric Railway could make arrangements to take its cars off the city streets, either over elevateds, or through subways, and that the company retire from the local business entirely, leaving the field to the Los Angeles Railway."

In commenting on the threat of the Board of Public Utilities, Frank Karr, chief counsel for the Pacific Electric Railway, said:

"The Pacific Electric Railway always has been operated as a complete unit for the benefit of the entire country served, and we have never been able to segregate the weak and strong lines. I am sorry that a suggestion has been made that the through service might be interrupted by excessive stops. While, of course, it must be conceded that the city might have the power to do this, I do not believe it would be to the interest of city or the traveling public to cut down our running time to outside points. Los Angeles benefits from the bringing in daily of thousands of people from outlying districts. Millions of dollars are brought into the city every year in trade, and thousands of people do business in the city and maintain their homes in the suburbs.

"It will be remembered that at the last hearing before the City Council we pointed out that the Bairdstown business does not pay operating expenses, and that we would, if the Council desired, take up seriously with the city the question of giving up our city service in this section and turning over the business to jitney operation, if we could be relieved from the necessity of making any stops between Sierra Vista and Covina Junction."

The decision of the Railroad Commission dismissing the applications of Palms, Richardson, Bairdstown and other sections of Hollywood, to reduce fares on the Pacific Electric Railway to a 5-cent basis, was referred to at length in the issue of the ELECTRIC RAILWAY JOURNAL of Feb. 10, 1917, page 269.

Seven-Cent Fare Hearing

Proposed New Rate on Worcester & Warren Street Railway Suspended—Case Closed

The Public Service Commission of Massachusetts gave a public hearing recently at Boston upon the proposed institution of a 7-cent fare unit on the Worcester & Warren Street Railway. Frank L. Palmer, president of the company, stated that the road has 19.6 miles of main and branch line track. The main line extends for 16 miles along the State highway between Boston and Springfield. It is the successor of the Warren, Brookfield & Spencer Street Railway and no dividends have been paid since 1901. In April, 1915, the road went into the hands of a receiver. As a result of reorganization all the stock and current liabilities of the old company were wiped out. The company has at present outstanding $116,600 in stock and $52,000 of bonds. The investment per mile has been reduced from $18,316 to $9,384, which is the third lowest of any company in the State. The company generates its own power and has been unable to purchase electricity more economically from any of the hydroelectric or central station companies within its territory.

Mr. Palmer said that the present cash fare is 6 cents. Workingmen's tickets are issued at present at the rate of 100 tickets for $5 and school tickets are available for teachers. With the proposed 7-cent rate, half-fare school tickets will be issued but these will not be honored when presented by teachers. It is proposed to eliminate the workingmen's special tickets and to reduce from 6 years to 5 years the age limit of children carried free. A single fare will also be charged per package carried on the platform. Fare zones vary from 3.9 miles to 6.96 miles in length, the average being about 5 miles. The present rate for through fares varies from 1.31 to 1.86 cents per mile and the proposed rates will vary from 1.53 to 2.17 cents. The towns and villages are so situated as virtually to preclude an additional fare zone. The operating revenue was $45,952 in 1916, or $20,000 less than in 1903, and in the past six months there was a deficit of $338. The revenue passengers fell from 1,367,515 in 1903 to 783,833 in 1916. Only three passengers were carried per car-mile last year. The population of the five towns served by the company is 4869 less than when the road was built. The present tributary population is 16,556. The operating revenue per car-mile in 1916 was 17.59 cents; operating expenses were 15.61 cents, and the net was 1.98 cents, the last comparing with the Massachusetts average of 8.99 cents.

The cost of power for 1916 was 1.9 cents per kilowatt-hour exclusive of interest and depreciation. There was a 10 per cent wage increase in May, 1916. Mr. Palmer said that a total revenue of $55,920 is necessary to meet the company's obligations, including a 7 per cent dividend allowance. The road needs further reconstruction and improvement to the extent of at least $50,000. It is doubtful if more than $5,000 additional revenue can be obtained from the proposed increase, considering probable loss in traffic following the higher rate. The distance between towns is too short for the provision of additional fare zones. One-man cars are under consideration as a partial solution of the company's difficulties. The hearing was closed, and subsequently the commission issued an order further suspending the proposed increase in rates until April 1.

Railway Gets Bus Franchise

A franchise to operate lines of motor buses in the southeastern part of the city of Portland, Ore., was granted by the City Council on Feb. 14 to Stephen Carver, president of the Portland & Oregon City Railway, under the name of the Portland Trackless Car Company. This is the first of three franchises asked for by Mr. Carver.

The franchise will go into effect in sixty days unless the referendum is invoked to block it. The Jitney Drivers' Union has fought the issuing of any franchise to Mr. Carver, and it is thought likely that it may attempt to refer the franchise to the people.

A duration of three years is provided for the franchise, which also makes provision for a 5-cent fare, and the privilege of transfer, not only on other buses of the same system, but also on cars of the Portland & Oregon City Railway.

Withdrawal of Transfers Justified

Commissioners Base Their Approval of Transfer Withdrawal on Inequality of Fares and Prospect of Devoting Added Revenue to Betterment of Service

In discussing the decision of the Public Service Commission of New York, Second District, in permitting the United Traction Company, Albany, N. Y., to withdraw the transfer privileges to and from the Albany-Troy and Albany-Cohoes interurban lines and the city lines in all three cities, as announced in last week's issue of this paper, the opinion of the commission, written by Commissioner James O. Carr, was set forth in part as follows:

"It needs no argument to support the contention that street railway passengers cannot be profitably carried these distances (over city lines and to interurbans on transfers) a large part of which is in cities and over paved streets, for less than 1 cent per mile. We are not attempting to determine this case upon any question of the physical valuation of the property of the United Traction Company, or upon its urgent need for additional revenue, which it probably should have, but upon the sole ground of the inequality of fares as between the city line passengers and those making use of the city lines as well as the interurban lines for the purpose of reaching their destinations, as we think that this is the proper basis for the disposition of this case."

The opinion, nevertheless, contains a comprehensive review of the financial history of the United Traction Company and its relations with the Delaware & Hudson Railroad and Hudson Valley Railway. Mr. Carr, supported by Commissioners Van Santvoord and Irvine in concurring opinions, criticizes the financial policy of the company which was responsible for an issue of $7,500,000 of United Traction Company stock for the purchase of the Hudson Valley Railway and the policy which has paid dividends on a $12,500,000 capitalization during years when these moneys should have been turned back into the company for the rehabilitation of the property and for the accrual of a reserve against depreciation.

Mr. Van Santvoord in his opinion bases his approval of the withdrawal of the transfers on the knowledge that the added revenue will be devoted to the betterment of the service rather than upon the theory that the transfer privilege constitutes a practice so discriminatory as to be abolished under the law. He says that he is willing to compel the Delaware & Hudson Railroad to "go the limit" in providing funds or credit to the United Traction Company. He alludes to the railroad company as the "mother-in-law" of the traction company, and all of the Commissioners agree that the "mother-in-law" has received an ample return for its interest in the trolley concern.

Street Railway Problems Acute

Increased Industrial Activity in Buffalo, Rochester, Binghamton and Rome Causes Congestion

Immediate steps for the betterment of the Buffalo street railway situation are presaged in the action of the Public Service Commission for the Second District of New York at its meeting in Albany on Feb. 28, upon the renewed insistence of Commissioner Hodson. Chairman Seymour Van Santvoord, who has hearings scheduled for Buffalo in other matters during the week beginning March 5, expressed his willingness to take up the street railway matter at the same time. On Commissioner Hodson's request Inspector Barnes will accompany the chairman. Such immediate steps will be taken, irrespective of any lengthy formal survey, as will bring prompt relief.

While the condition of street railway traffic in several other parts of the State, where facilities are being strained by the increased industrial activity, make a formal survey of the Buffalo service impossible for some time to come, the sense of the commission at the meeting on Feb. 28 seemed to be that more effective measures can be taken in the shorter method outlined. As stated elsewhere in this department of the ELECTRIC RAILWAY JOURNAL the commission in this informal way has just succeeded in straightening out a traffic situation in Binghamton. Conferences between Mr. Barnes and city officials and officers of the New York State Railways in Rochester and Rome are now in progress and promise the satisfaction of a number of complaints that have been made in those cities.

Buses for Auxiliary Service

The Board of Public Works of San Francisco has awarded a $29,550 contract to the White Company for five auto buses to be used in auxiliary service by the Municipal Railway system, for delivery within 120 days.

These five buses are the first to be purchased by the city for this kind of service. They will be operated across Golden Gate Park, connecting Richmond and Sunset Districts, and providing the latter with a direct-to-the-ferry route. From the present terminal of the Municipal line at Tenth Avenue and Fulton Street the buses will run across the park to Ninth Avenue and Lincoln Way, thence to Judah Street, and out Judah Street to Thirty-third Avenue. There may be a later extension to the Ocean Beach if warranted.

The new buses will be inclosed, semi-convertible, single-deck, prepayment type and arranged for one-man operation. The seating capacity will be nineteen, with a total capacity of thirty passengers.

In reporting on the bus route, the city engineer stated that any such route once established must be maintained until replaced by railway operation. This is necessary, he pointed out, so that the district served may enjoy that full measure of growth which depends upon permanently established service.

The city also has agreed, upon the request of the State Harbor Commission and the recommendation of the city engineer, to establish a bus service upon the Embarcadero, operating between Fishermen's Wharf on the north and the channel on the south. This service, however, is not to be provided until the Harbor Commission shall have laid a smooth pavement along this route and this work will probably require from six to nine months.

Service Changes at Rochester

Among Other Adjustments, Schedules Will Be Lengthened in Order to Prevent Bunching of Cars

As result of a conference held recently before the Mayor of Rochester, N. Y., the following service changes, approved by Charles R. Barnes, electrical expert of the Public Service Commission of New York, Second District, have just been put into effect on the Rochester lines of the New York State Railways:

Schedules have been revised on different lines, giving a longer running time, particularly during rush hours, in order to increase regularity in headway by absorbing minor delays and reducing the bunching of cars.

The efficiency of the dispatching system, which has recently been curtailed, will be in future operated to its fullest capacity and will be a factor in improved service.

The inspectors have been rearranged so that a sufficient number will be located at points on the system where they can best look after the movement of cars, especially during rush hours. At other times these men will be riding the cars on the different lines.

Orders have been issued for strict enforcement against running by passengers at street corners.

In addition to these changes J. F. Hamilton, the newly appointed general manager of the company, has announced the absorption of the service improvement department by the general manager's office. This means that in the future all complaints will be either considered or handled by the general manager, in order that he may have closer working arrangements with the public.

Washington Jitneys to Be Regulated by Service Commission.—The Washington State Senate on Feb. 20 passed the joint public utilities committee bill, providing for the regulation of jitneys by the State Public Service Commission.

Louisville Plans to Eliminate Grade Crossings.—The Engineers and Architects Club of Louisville, Ky., has called on all the other technical and commercial as well as civic organizations to co-operate with it in making arrangements for a thorough survey of the city, partly with a view toward eliminating grade crossings.

Near-side Stop in Galveston, Tex.—Near-side stops for street cars were authorized in Galveston, Tex., on Feb. 23, when the recently enacted traffic ordinances became effective. C. S. McLin, traffic superintendent of the Galveston Electric Company, has had shell walks and alighting places placed on the near side of all unpaved streets.

School Fare Bill Introduced in New York.—A bill has been introduced in the Assembly of New York which provides for the sale of half fare tickets by street railways to the pupils of public schools, good on school days and between fixed hours. The act, if passed, will go into effect on June 1. It has been referred to the committee on railroads.

Instructors for East St. Louis Platform Men.—In order to improve its train service the East St. Louis & Suburban Railway, East St. Louis, Ill., has employed two instructors for its employees. One for the conductors and the other for the motormen. Among the matters to be discussed are the loading and unloading of passengers, the methods of fare collection, and the keeping of the doors closed.

Atlantic City Line Issues Live Folders.—The Atlantic City & Shore Railroad, Atlantic City, N. J., has recently started for the benefit of its patrons the weekly publication of a four-page pamphlet, entitled "Trolley Talks." The pamphlets, each issue of which is printed in different colored ink, reflect the versatility of their editor in presenting by varied aspects the conveniences and facilities of service which this trolley system provides. The points conveyed by the text are sharpened by the frequent insertion of small cartoons.

Lexington Cars Solicit Lighting Contracts.—Cars of the Kentucky Traction & Terminal Company, operating the Lexington, Ky., city service, and affiliated with the Lexington Utilities Company, are serving as "sandwich men" for the lighting branch of the organization. On the front ends of the cars signs announce that four-room cottages will be wired by the company for $26 and the rear end signs refer to six-room cottages, wired for $36.

B. R. T. Pays $174 in Bonuses.—Bonuses for the year 1916, amounting to a total of $174, have been distributed to thirty-six men at the elevated-subway maintenance shops of the Brooklyn (N. Y.) Rapid Transit System as a reward for their vigilance in the finding of loose or cracked wheels, loose or cracked tires, broken or cracked spring plank hangers, equalizer bars and Gibbs motor suspensions, on the elevated and subway equipment, and the reward was made at the rate of $2 in each instance.

Jitneys Unrestrained in Dallas, Tex.—Jitneys in Dallas, Tex., are running without restraint since the injunction was recently granted in the district court in favor of the jitneys and against the city, declaring the ordinance recently enacted by the city unfair and unreasonable. The city has perfected an appeal to the Court of Civil Appeals, but it will be several weeks before a decision can be had. In the meantime the city attorney ruled that since the old jitney ordinance had been repealed by the city in the enactment of the new ordinance, the jitneys could secure injunctions against any old ordinance that the city might attempt to enforce.

Safety Work of Kansas City Railways.—W. S. Woodland, safety director of the Kansas City (Mo.) Railways, has in the past school season made safety talks, illustrated with moving pictures, to every public school in Kansas City, Mo., and Kansas City, Kan., except a few very small ones in the outlying districts. Every school child has received one of the safety buttons provided by the company. The board of education recently authorized the placing of bulletin boards in each school having manual training, for the posting of National Safety Council and other bulletins on safety, to be provided by the railways company. There will be ninety-six of such boards.

Grand Rapids Railway Talks to Public.—The Grand Rapids (Mich.) Railway has printed a full-page advertisement in the *Michigan Tradesman* entitled, "Another Friendly Talk to a Friendly People by a Friendly Company," which contains a frank discussion of some of the company's problems. In analyzing its receipts for the year the company states that its 1916 gross receipts increased only 10 per cent as compared with the increase in Grand Rapids of 30 per cent in bank clearings, 25 per cent in building and 17 per cent in deposits. The small increase in the company's gross receipts was still further offset to some degree by the increase in expenses.

Wilkes-Barre Jitneys Lose in Court.—In an opinion by Justice Potter, the Supreme Court of Pennsylvania has affirmed, with certain modifications, the decree of the Common Pleas Court of Luzerne County, which was appealed from by the Jitney Bus Association of Wilkes-Barre. The suit of the jitney owners, in their fight to run autos carrying passengers for 5 cents a head or six rides for a quarter, was directed against the city of Wilkes-Barre, which, under the act of June 1, 1915, passed an ordinance requiring the operator of every jitney to furnish a $2,500 bond to insure the payment of any damage resulting from the operation of his car. The terms of the ordinance were regarded as harsh and unreasonable and intended to put the jitney people out of business.

Application Against Illinois Two-Cent Rate Denied.—Application of the Illinois Central Railroad and twenty-seven other railroads to enjoin enforcement of the Illinois 2-cent passenger rate was denied on Feb. 23 by Associate Justice Clarke of the Supreme Court. At a recent hearing before Justice Clarke the railroads sought a writ to suspend the State's 2-cent law pending their appeal to the Supreme Court from dismissal of their suit by Federal District Judge Landis. Attorney-General Brundage and other counsel representing the Illinois Public Utilities Commission opposed the railroads' application. In a memorandum opinion given on Feb. 23 in the proceedings, Justice Clarke said that, even assuming an individual justice had authority to suspend the Illinois rates pending appeal, and that that authority is not clear, he would deny the railroads' application.

High Costs Handicap Spokane Jitneys.—In order to handle all passenger traffic in Spokane, 730 jitneys would be required, a condition it holds to be impossible of realization, according to a recent report of the traffic situation in Spokane, Wash., submitted to the Washington Public Utilities Commission. Now the jitneys take care of only 10 per cent of the passengers. The high operating cost is held responsible for the failure of the jitney bus to make more rapid strides. The lowest figure this cost can be set at for any jitney is $4.36 daily. The average daily earnings are $7.50. Taking from the latter amount State and city taxes, insurance, garage expense and depreciation of the cars, little is left to pay the driver. The relative average percentages of the city's traffic carried by the three transportation companies is estimated as follows by the survey: Washington Water Power Company, 52.5; Spokane Inland Empire Railroad, 37.6, and the Jitney Association, 9.9.

Binghamton Traffic Matters Settled at Conference.—At a conference between C. R. Barnes, electric railroad inspector of the Public Service Commission of the Second District of New York, Alderman Bull, Alderman Robinson and Alderman Carman of Binghamton, N. Y., on Jan. 13, it was decided that the three aldermen should confer with the officials of the Binghamton Railway in regard to the complaint with respect to service over that line, noted in the ELECTRIC RAILWAY JOURNAL of Jan. 27, page 186, and then communicate with Mr. Barnes in regard to the outcome of the conference. Alderman Carman has reported to Mr. Barnes in a letter dated Feb. 5 that at the conference with F. L. Fuller, president of the Binghamton Railway, and C. S. Banghart, vice-president and general manager of the company, the officers of the company were glad to meet the representatives of the city half way. Mr. Carman expresses the opinion that the service has been greatly benefited by the conference with Mr. Barnes and the street railway officials. He has also thanked Mr. Barnes on behalf of the committee for his interest in the local situation in Binghamton.

Personal Mention

C. E. Anderson has resigned as land commissioner of the Illinois Traction System, with offices at Champaign, Ill.

F. M. Martzall has been appointed to the newly created position of purchasing agent of the Jacksonville (Fla.) Traction Company.

I. M. Stover, formerly manager of the Key West (Fla.) Electric Company, has been appointed manager of the Baton Rouge (La.) Electric Company.

H. D. Whitamore, who has been connected with the West Virginia Traction & Electric Company, Wheeling, W. Va., has been appointed general manager to succeed R. D. Jennison.

Frederick L. Hopkins, formerly treasurer of the Blue Hill Street Railway, Canton, Mass., has been appointed to a position in the treasurer's department of the Boston office of Stone & Webster.

C. B. Nellis has been appointed acting division superintendent of the Cayadutta Division of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., to succeed the late C. Banker.

John Zarr, for eleven years master mechanic of the City Light & Traction Company, Sedalia, Mo., has resigned to accept a position with the Trinidad Electric Transmission & Gas Company, Trinidad, Col.

Dr. Morton G. Lloyd, formerly technical editor of the *Electrical Review and Western Electrician*, has accepted a temporary appointment as associate engineer in the Bureau of Standards, Washington, D. C.

W. J. Kyle, who has had extensive experience in western electric and power properties, has been appointed general manager of the Bridgeton & Millville Traction Company, Bridgeton, N. J., succeeding B. F. Hires.

T. C. McReynolds, secretary, treasurer and general manager of the Indiana Railway & Light Company, Kokomo, Ind., has resigned on account of ill health which has made it necessary for him to reside in Phoenix, Ariz.

R. C. Green, heretofore master mechanic of the Easton (Pa.) Transit Company, has been appointed superintendent of equipment of the Lehigh Valley Transit Company, Allentown, Pa., succeeding Harry Branson, resigned.

Eugene McQuillin resigned on Feb. 21 as a member of the Public Service Commission of Missouri. His resignation was accepted to take effect at once. Mr. McQuillin will return to St. Louis and resume the practice of law.

W. A. Clow, formerly master mechanic of the Fox & Illinois Union Railway, at Yorkville, Ill., has resigned this position to become assistant master mechanic of the Joliet & Eastern Traction Company, at the shops, Frankfort, Ill.

J. E. Gallaher has been transferred by the Stone & Webster Management Association, Boston, from the Northern Texas Traction Company, Fort Worth, Tex., to the Houghton County Traction Company, and has taken the position of master mechanic.

M. P. Chapman, connected with the maintenance department of the Portland Railway, Light & Power Company in Oregon City, Ore., has resigned from that company to accept a foremanship with the Hawley Pulp & Paper Company of Oregon City.

Edward A. Maher, Jr., for over three years assistant general manager of the Third Avenue Railway, New York, has been appointed vice-president and general manager of the company, succeeding his father, Edward A. Maher, Sr., who was recently elected president.

G. L. Enfors is now superintendent of the repair shops and railroad and trolley divisions of the Porto Rico Railway, Light & Power Company, which has general offices at San Juan, P. R., and not at Ponce, as reported in the personal notes of the ELECTRIC RAILWAY JOURNAL of Feb. 3.

Benjamin F. Wood has resigned as vice-president and chief engineer of the United Gas & Electric Engineering Corporation, New York, and will devote his time in the future to B. F. Wood, Engineers, Inc., a new company of which Mr. Wood is president.

James E. Davidson, vice-president and general manager of the Pacific Power & Light Company, Astoria, Ore., will resign this position to take up work with the Electric Bond & Share Company, New York. His first work will be at Omaha, where he will be connected with the Omaha Electric Light & Power Company.

C. R. Collins has been appointed superintendent of the Grays Harbor Railway & Light Company, Grays Harbor, Wash. Mr. Collins has been connected with the Stone & Webster electric interests at Seattle, Wash. Previous to that he was with the Westinghouse interests in the East. He is a graduate of Purdue University.

George A. Hearn, who has served in various official capacities with the San Francisco, Napa & Calistoga Railway, Napa, Cal., including the positions of electrical engineer and later superintendent of power and equipment, has resigned from that company to accept a position with the Ogden, Logan & Idaho Railway, Ogden, Utah.

Otto Snyder, superintendent of the Electric Light Company, recently transferred to the Adirondack Power Company, Glens Falls, N. Y., has been temporarily re-installed by the Stone & Webster Management Association, Boston, at Houghton, as general superintendent of the lighting and traction companies, until the arrival of a successor to Gardner Rogers, transferred as noted elsewhere in this column.

Raymond H. Smith, vice-president and general manager of the Sheboygan (Wis.) Electric Company, has been elected vice-president of the Eastern Wisconsin Electric Company, which was incorporated on Feb. 21 in Wisconsin as a consolidation of the Eastern Wisconsin Railway & Light Company, Wisconsin Electric Railway, and the Sheboygan Electric Company.

Gardner Rogers, manager of the Houghton County Electric Light Company and Houghton County Traction Company, Houghton, Mich., has been transferred by the Stone & Webster Management Association, Boston, to the position of manager of the Woonsocket Division of the Blackstone Gas & Electric Company, with headquarters at Woonsocket, R. I.

B. F. Hires, who has been manager of the Bridgeton & Millville Traction Company and the Bridgeton Electric Company, Bridgeton, N. J., for the last seventeen years, and also in the same capacity for the Electric Company of New Jersey for the last year, has been appointed special agent of the American Railways, Philadelphia, which owns the property of the above-named companies.

Thomas Maclay has been elected president of the Petaluma & Santa Rosa Railway, Petaluma, Cal., succeeding Edward T. McMurray, attorney for the company, who has also held the office of president since the death of the late E. M. Van Frank, who for years was head of the company. Mr. Maclay has been one of the directors of the company and is president of the Petaluma Swiss-American Bank.

D. H. Braymer, who for the past two years has been engineering editor of the *Electrical World*, has resigned to assume the editorship of the *Electrical Record*. Mr. Braymer succeeds George A. Wardlaw, who will engage in free lance literary work. Prior to his connection with the *Electrical World*, Mr. Braymer was editor of *Electrical Engineering* of Atlanta, Ga., and of its predecessor, the *Southern Electrician*.

R. D. Jennison, vice-president of the West Virginia Traction & Electric Company, with office at Wheeling, W. Va., has left this position to become general manager of the Pennsylvania Utilities Company, Easton, Pa., succeeding W. D. Ray, whose resignation was announced in the ELECTRIC RAILWAY JOURNAL of Feb. 17. The Pennsylvania Utilities Company furnishes electricity, gas and electric railway service to Easton and neighboring towns.

J. A. Kunz has been appointed master mechanic of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y.

Mr. Kunz has lately been foreman of one of the subway car shops of the Interborough Rapid Transit Company, New York, N. Y. Before that he was connected with the Brooklyn (N. Y.) Rapid Transit Company for twenty years, serving during the latter part of his term with the company as master mechanic of the elevated line shops.

J. A. Laing, for five years general attorney for the Pacific Power & Light Company, Astoria, Ore., and for the Portland Gas & Coke Company, will be elected vice-president of the former company. Previous to his railway work Mr. Laing practised law in New York. He is a graduate of Dartmouth, and has been a prominent member of the Progressive Business Men's Club in Portland. In addition to executive duties, he will continue in charge of the company's legal work.

Lewis A. McArthur, assistant general manager of the Pacific Power & Light Company, Astoria, Ore., since 1912, will succeed J. E. Davidson as general manager. Mr. McArthur is a native Oregonian. He graduated from the University of California in 1908, and for two years was employed by the Oregon Electric Railway, Portland, Ore. On the formation of the Pacific Power & Light Company, in 1910, he assumed the duties of chief clerk for Guy W. Talbot, president of the company.

Prof. R. C. Carpenter will sever his active connection with Cornell University at the end of the present college year, having reached the retiring age. He expects to maintain his activities in the fields of engineering and research, however, for several years to come. In resolutions recently passed the trustees referred to him as a pioneer in the field of experimental engineering, and said that as a teacher and investigator he is affectionately remembered by many generations of students, while his retirement from the faculty will be viewed with great regret by all his colleagues.

C. J. Munton, general manager of Fort Wayne & Northwestern Railway, Kendallville, Ind., and receiver of the Winona Interurban Railway, Warsaw, Ind., has been elected to Indiana State Senate. Before going to Kendallville in 1911 Mr. Munton was a division superintendent of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., having entered the employ of that company in 1896 as a motorman. He began his work in Kendallville as manager for the receiver of the old Toledo & Chicago Interurban Railway, organized in 1913 as the Fort Wayne & Northwestern Railway.

E. W. Moore, who has retired as president of the London (Ont.) Street Railway, will now be in a position to give his exclusive attention to the Lake Shore Electric Railway and the Cleveland, Painesville & Eastern Railway, of both of which he is president, and to the Detroit United Railway, of which he has been vice-president for the last twenty years. Both he and Henry A. Everett retain their interests in the London Street Railway. London is the old home of Charles Currie, who has succeeded Mr. Moore in that city, and having retired from the general managership of the Northern Ohio Traction & Light Company, Mr. Currie will have more time to devote to the company, although he will make his home at Akron, Ohio.

John B. Crawford, general superintendent of the Central Illinois Utilities Company, Paxton, Ill., has, in addition to this position, been elected vice-president of the company. From 1912 to the early part of 1916 Mr. Crawford was division superintendent of the Central Illinois Public Service Company, in charge of a large number of operating electric light and water properties. In the past Mr. Crawford has been connected with a number of railways, including the Lexington & Interurban Railways, Lexington, Ky.; Fort Wayne & Wabash Valley Traction Company, Fort Wayne, Ind.; Winona Interurban Railway, Warsaw, Ind.; Groton & Stonington Street Railway, New London, Conn., and Hartford (Conn.) Street Railway.

J. F. Strickland, president of the Texas Electric Railway, Dallas, Tex., a consolidation of the Texas Traction Company and the Southern Traction Company, is a native of Alabama. Mr. Strickland went to Texas in 1879, and has been associated with interurban and other utilities in that State since 1904, when he moved to Dallas. His first venture in electric interurban building was the promotion of the Texas Traction Company. This company constructed the Dallas-Sherman line in 1906-08, and opened the road to traffic in July, 1908. More than $2,000,000 was spent in building and equipping the line. Mr. Strickland, as president of the Texas Traction Company, was the moving force that put the line in the fore rank as an interurban property in Texas. Mr. Strickland's next venture was to promote the Southern Traction Company. This company built lines from Dallas to Corsicana, and from Dallas to Waco, a total of 156 miles. Mr. Strickland also organized the Texas Light & Power Company, which owns and operates electric light plants in various cities and towns, with its principal power plant on the line of the Texas Traction Company near McKinney. The Texas Light & Power Company has purchased the gas and electric lines in various cities, and is now supplying these cities with gas and electricity. Mr. Strickland is also president of the Dallas Securities Company, a company organized to handle the stock and bond issues of the various utility companies under his control. Mr. Strickland was the moving force in the consolidation of the Texas Traction Company and the Southern Traction Company, which was effected in January, 1917, and at the time of the consolidation was elected president of the Texas Electric Railway, the consolidated company. Mr. Strickland has also been interested in the reorganization of the Dallas street railway system, plans for which have been approved by the City Commission and an ordinance granting the traction and lighting franchises passed. These ordinances, on the motion of Mayor Lindsley of Dallas, have been submitted to a referendum election to be approved by the majority of the voters of Dallas before becoming effective.

Burr Martin, vice-president and general manager of the Texas Electric Railway, Dallas, Tex., became associated with electric railway properties in Texas early in 1907, at the time J. F. Strickland began the financing and construction of the interurban line from Dallas to Sherman, under the name of the Texas Traction Company. Mr. Martin was appointed purchasing agent for that company, and served in the capacity mentioned during the construction of the line. At the time the Dallas-Sherman interurban line was put in operation in July, 1908, Mr. Martin was appointed claim agent for the Texas Traction Company. When the Southern Traction Company was organized in 1911 for the purpose of building interurban lines from Dallas to Waco and from Dallas to Corsicana, a total distance of 156 miles, Mr. Martin was appointed assistant to J. F. Strickland, the president, and in 1912 was elected president of the Southern Engineering & Construction Company, which built the lines of the Southern Traction Company. In this capacity he had charge of the construction and equipping of the entire mileage of the lines from Dallas to Waco, and from Dallas to Corsicana. In 1915 Mr. Martin was appointed general manager of the Texas Traction Company and the Southern Traction Company, the so-called Strickland Lines. He held that position until the two companies were consolidated in January, 1917. At the time the two lines were consolidated as the Texas Electric Railway, owning and operating 251 miles of line, extending from Denison to Dallas, there branching into two lines, one to Waco and the other to Corsicana, Mr. Martin was elected vice-president and general manager of the Texas Electric Railway.

BURR MARTIN

Obituary

R. E. Griffith, claim agent for the Beaumont (Tex.) Traction Company since last June and prior to that an employee of the Northern Texas Traction Company at Fort Worth, Tex., died in Beaumont on Feb. 17.

Legal Notes

CHARTERS, ORDINANCES, FRANCHISES

NEW YORK.—*Power of City to Require Relocation of Tracks.*

Since the implied power of a municipal corporation must be essential to the exercise of an express power and not merely convenient thereto, the power of a city to compel a street railway to move its track from the side to the center of a street cannot be implied from the power granted in the city charter to discontinue, lay out, widen, open, alter, change the grade or otherwise improve roads, avenues or streets. (People ex rel. City of Olean v. Western New York & Pennsylvania Traction Co., 108 Northeastern Rep., 847.)

NORTH CAROLINA.—*Operation of Freight Cars by Street Railway Not Enjoined.*

In the absence of an allegation of irreparable damage or serious injury by the operation of freight cars over a street railway, the courts will not enjoin the operation which is in the nature of a public enterprise and improvement and for the welfare of the community. (Turner et ux. v. North Carolina Public Service Co. et al., 86 S. E. Rep., 1033.)

NORTH CAROLINA.—*Interurban Road May Be Classed as Steam Road as Regards Abutting Property Owners.*

An interurban railroad, though operated by electric power, which ran freight trains through the streets and interchanged cars with ordinary steam railroads, must be classed as a steam railway, and an abutting owner, injured by the noise and dirt from the trains which passed in the street in front of his house, could recover damages. (Kirkpatrick et al. v. Piedmont Traction Co., 87 Southeastern Rep., 232.)

NEW YORK.—*Deductions from Franchise Tax.*

Under the State franchise tax law, a company may deduct from its State tax any sums paid to the municipality for its franchise. (New York Railways v. City of New York, 113 Northeastern Rep., 501.)

LIABILITY FOR NEGLIGENCE

ILLINOIS.—*Injury to Motorman in Failing to Turn off Controller Before Backing Car.*

A motorman directed to take a trolley car from the barn and injured by the backing of it when he put the trolley on was guilty of contributory negligence in not first seeing whether the controller was turned on, which he could have done had he looked, though under the rule of the company and the custom of the men, the one who last had the car should have removed the controller and the reverse lever and turned the power off, so that the putting on of the trolley would not have started the car. (Lossechewich v. Chicago City Railway, 113 Northeastern Rep., 896.)

MASSACHUSETTS.—*Infant Injured Through Negligence of 12-Year-Old Custodian.*

Where the twelve-year-old brother of an irresponsible infant went upon the street car tracks with him, without looking, in front of an approaching car, in plain sight, only a short distance away, and the infant was killed by the car, there can be no recovery. (Garabedian v. Worcester Consol. St. Ry., 113 Northeastern Rep., 780.)

MONTANA.—*Injuries from Broken Register Strap—Sufficiency of Inspection.*

Where straps in a street car used for registering fares were inspected by looking at them but were not tested by ringing fares, the company was liable where a strap broke, causing the conductor to fall upon the plaintiff. (Batch v. Helena Light & Ry. Co., 159 Pacific Rep., 411.)

NEW YORK.—*Assault by Conductor Where Passenger Was Aggressor.*

That a passenger on a street car was the aggressor in an altercation over his right to a transfer does not justify the conductor in assaulting him, and, where the conductor so assaulted him, substantial damages should be imposed. (Schwartz v. New York Rys., 160 New York Supp. 1081.)

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

Eastern Wisconsin Electric Company, Grand Rapids, Mich.—This company filed articles of incorporation with the secretary of state of Madison, Wis., on Feb. 21. It will be the successor company by consolidation of the Eastern Wisconsin Railway & Light Company, the Wisconsin Electric Railway and the Sheboygan Electric Company. Officers: Joseph H. Brewer, Grand Rapids, president; Raymond H. Smith, Sheboygan, vice-president; Willis J. Ripley, Grand Rapids, treasurer, and Blaine Gavett, Grand Rapids, secretary.

***United National Utilities Company, Philadelphia, Pa.**—This company has filed a charter at the State Department in Dover, Del. Capital stock, $20,000,000. Incorporators: F. R. Hansell, Joseph F. Cotter, Philadelphia, and S. C. Seymour, Camden, N. J.

FRANCHISES

Los Angeles, Cal.—The Pacific Electric Railway has received a franchise from the City Council for a right-of-way on Eighth Street between Los Angeles Street and Maple Avenue.

Boston, Mass.—The Public Service Commission of Massachusetts has granted a one-year's extension of time to the Boston Elevated Railway for the completion of the Mystic River railway bridge and viaduct which is to carry the elevated system into Everett.

Buffalo, N. Y.—The International Railway has asked the Public Service Commission for the Second District of New York for its approval of the construction of extensions of the company's tracks in Elmwood Avenue from Hertel Avenue to the north city line and in Franklin Street from Chippewa Street to Allen Street.

Philadelphia, Pa.—The city of Philadelphia has asked the Public Service Commission of the Commonwealth of Pennsylvania for a certificate of public convenience, approving the plans and authorizing the construction of an elevated railway beginning at or near Thirtieth and Market Streets with a connection to the present Market Street elevated line, thence southwardly over Thirtieth Street to a point south of Walnut Street, thence over private right-of-way along the route of the Pennsylvania Railroad, thence over Gray's Ferry Avenue to Forty-ninth Street, thence over Woodland Avenue to the city limits, about 4.5 miles.

Olympia, Wash.—The Tacoma Railway & Power Company has applied to the County Commissioners of Thurston County for a franchise to erect, maintain and operate electric transmission lines from the Tacoma city limits to the Brown Ranch near Nisqually. The proposed improvement is the initial step toward the extension of light and power service through this section of Thurston County, and it is believed is the forerunner of interurban connections between Tacoma and Olympia.

TRACK AND ROADWAY

Municipal Railways of San Francisco, San Francisco, Cal.—A contract has been let by the Board of Works to the Telephone Equipment Company, San Francisco, to supply 34,500 lb. of electric trolley wire to the Municipal Railways for $13,702. The wire will be used on the Twin Peaks tunnel extension and on that part of the upper Market Street line between Van Ness Avenue and Church Street.

Washington, D. C.—As a result of a recent meeting held at Westminster, a committee will be appointed by William Mather, Jr., who presided, to secure rights-of-way for the proposed electric railway from Washington, D. C., to Gettysburg, Pa., via Westminster, 75 miles. The Southern

Finance & Construction Company, Nashville, Tenn., of which John K. Parsons, Wilmington, Del., is president, and R. B. Herzer, Nashville, is secretary, was previously reported interested in such a line. [Jan. 27, '17.]

Public Service Corporation of New Jersey, Newark, N. J.—Thomas N. McCarter, president of the Public Service Corporation of New Jersey, on Feb. 19 informed Mayor Thomas L. Raymond of Newark that plans which have been under discussion for the last year between his company and the Pennsylvania Railroad have been completed and agreed upon for the linking of the high speed lines of the Pennsylvania Railroad which enter Newark at the Park Place Terminal of the Hudson & Manhattan Railroad, and the Public Service trolley system, which also has a terminal in Park Place, Newark. As noted in the ELECTRIC RAILWAY JOURNAL for Feb. 24, page 361, the work proposed will cost between $800,000 and $1,000,000.

Brooklyn, N. Y.—As the first step toward carrying out the new transit plans for the relief of central Brooklyn, the Public Service Commission for the First District of New York has adopted the general route to provide for a connection between the Fulton Street elevated line and the Fourth Avenue subway at Ashland Place. The consent of the Board of Estimate and of the Mayor will be asked to this new route and if these are obtained the commission will make an effort to obtain the consents of the abutting property owners. The route in question extends along Fulton Street between Vanderbilt Avenue on the east and Rockwell Place on the west with a spur for one track through Lafayette Avenue and abutting private property for a short distance. The two tracks provided for in this route will begin to depress near Vanderbilt Avenue and will go underneath the surface of Fulton Street just west of Carlton Avenue.

Brooklyn (N. Y.) Rapid Transit Company.—Work will soon be begun by the Brooklyn Rapid Transit Company on the elevated structure to be erected along the Long Island Railroad cut, between Wyckoff and Irving Avenue. That section of the improvement will connect the elevated lines extending from the Ridgewood section to the Williamsburg and Manhattan bridges and the lines now being completed by the Brooklyn Rapid Transit Company in the fourth ward and will also give express service from the south side of the borough and the Ridgewood section to the southerly business sections of Manhattan and will make it possible to reach Manhattan in about fifteen minutes from the Ridgewood section and thirty minutes from the Jamaica zone.

Panama Traction Company, Jamestown, N. Y.—A contract has been awarded to Herbert Norton, Jamestown, for the construction of a bridge over the Stillwater Creek at Busti Corners in connection with this company's proposed line from Youngsville, Pa., to Jamestown, N. Y. D. L. Davis, Jamestown, general manager. [Feb. 10, '17.]

Toronto (Ont.) Civic Railway.—The cost of a single-track extension of the Bloor Street car line on Bloor Street from Quebec Avenue has been estimated by R. C. Harris, commissioner of works, at $30,000.

Southern Pacific Company, Portland, Ore.—An elevated viaduct and grade crossing over Second Street, La Grande, will be constructed by the Southern Pacific Company. The proposed structure will be of steel construction and will cost about $330,000.

West Penn Traction Company, Pittsburgh, Pa.—The construction of an extension to West Newton and other Youghiogheny River towns, connecting with its present lines at Hunker or at Greensburg, is being considered by the West Penn Traction Company.

Houston, Richmond & Western Traction Company, Houston, Tex.—At a recent meeting of the officers and directors of the Houston, Richmond & Western Traction Company the name of the company was changed to the Houston, Gonzales & San Antonio Traction Company. The capital stock of the company was increased from $50,000 to $250,000. Ed Kennedy, the original promoter of the line, retired, and Frank Helbig and W. A. Reinhart were appointed to take active charge of the affairs of the company at Houston. Steve Holmes, president. [Dec. 30, '16.]

San Antonio (Tex.) Traction Company.—It is reported that the San Antonio Traction Company proposes to construct an extension several miles long.

Ashland Light, Power & Street Railway, Ashland, Wis.—An extension from Hurley to Montreal will be built by the Ashland Light, Power & Street Railway immediately. The construction of a line between Washburn and Ashland is also being contemplated.

SHOPS AND BUILDINGS

Chicago & Joliet Electric Railway, Joliet, Ill.—This company will construct a new office building at Joliet, estimated to cost $35,000.

Detroit (Mich.) United Railway.—This company is making plans for a new storage yard for track materials to occupy a 21-acre tract of land on the Rouge River and West Fort Street. The present 9-acre yard at Harper and Mount Elliott Avenues will be turned over to the transportation department for use as an operating station for the new Grand Belt line, which at present has no car station nearer than 2 miles from the line, resulting in a large dead mileage. The plans for buildings and equipment in the new storage yard have not been completed, but these will include the erection of an office building for the track department, clerical force and superintendent, a car repair shop, machine shop, foundry, carpenter shop and stock room, sand drier, a stone crusher with 1600 tons a day capacity and other equipment. It is estimated that it will require more than $400,000 to carry the plans to completion.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has directed a public hearing on the form of contract for the furnishing of structural steel for inspection sheds at the 180th Street and 239th Street car storage yards on the White Plains Road line. The two yards will provide sufficient capacity for the storage of several hundred subway cars and in addition the Interborough Rapid Transit Company will construct the yard at 239th Street for the storage and inspection of elevated railroad cars.

POWER HOUSES AND SUBSTATIONS

United Railways & Electric Company, Baltimore, Md.—Carrying out plans for the betterment of traffic conditions, this company will soon begin the construction and equipment of a new substation in the eastern section. The company has only recently completed and is now equipping another such station on Belvedere Avenue in the northwestern suburbs, and the cost of these two important accessories of the system will exceed $330,000. The latest station will be on the Sparrow's Point Line and will handle the current used on all the lines that traverse the county to the east of the city limits. The Sparrow's Point station will bring the number of the company's stations of this character to seven, and will very nearly approximate in general style and equipment the Belvedere station. The building housing this equipment is of reinforced concrete of attractive design, the floor plan being 51 ft. by 74 ft.

Kansas City (Mo.) Railways.—Recommendations have been made to this company for changes in its power facilities which will involve a total expenditure of $370,000, including $100,000 for the power plant proper, $161,000 for the substations and $30,000 for the switch-house. These improvements are referred to more in detail on page 404 of this issue.

Northern Ohio Traction & Light Company, Akron, Ohio.—Contracts have been let by the Northern Ohio Traction & Light Company for six 1000-kw. rotary converters and four boilers to be installed in its Gorge power house.

Cleveland (Ohio) Railway.—A contract has been awarded by the Cleveland Railway to W. I. Thompson & Son Company, Cleveland, for the construction of a substation at 2162 Ashland Road, to cost about $60,000.

Ashland Light, Power & Street Railway, Ashland, Wis.—The capacity of the power plant of the Ashland Light, Power & Street Railway at Ashland will be increased from 3000 to 12,000 hp.

Manufactures and Markets

Discussions of Industrial Conditions
A Department for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Business Announcements Trade Literature

First Year's Sales of Davis Wheels

Introduced to Electric Railways a Year Ago, Now Used by a Number of Large Roads—One-Wear Idea Has Met with Favor

The total sales of Davis steel wheels for 1916 showed an increase of 388 per cent over the sales for 1915. Not a large proportion of these sales, however, were in the electric railway field, because this one-wear steel wheel with its manganese tread was offered only for general sale to the electric railways with the beginning of 1915, although it served in steam railroad service about eight years, under both freight and passenger cars. According to Owen W. Middleton, of the American Steel Foundries, Chicago, Ill., in earlier years there were uncertainties in the manufacture of steel castings, which hindered the profitable manufacture of cast-steel wheels. However, improvements in foundry processes and refinement of metals, together with the use of the manganese mixture for the wearing parts of the tread and flange resulted about eight years ago in the manufacture of this wheel.

Although the American Steel Foundries have nine plants, eight of which are steel foundries and the other an assembling plant, the manufacturing of wheels is done in only one plant, that being in Granite City, Ill., a suburb of St. Louis. The other plants manufacture steam railway and similar specialties, such as truck frames, bolsters, journal boxes and springs, as well as heavy castings for industrial use.

ONE-WEAR WHEEL INTRODUCED IN 1911

The Davis steel wheel was introduced to the electric railway field for general sale only after it had shown itself to be fitted for severe conditions. The first Davis wheels to be used by an electric road were installed in 1911 by the Detroit United Railway. That company first purchased sixteen wheels, later twenty-four more, and since has ordered several hundred. The San Francisco & Oakland Terminal Railways installed a few Davis wheels in 1912. Subsequent orders specified 33-in. wheels under its city cars and 36-in. M.C.B.-tread wheels under its large Key Route cars. The Illinois Traction now has 1666 Davis wheels in service under various classes of equipment. Other properties which have purchased this type of wheel for city or interurban service include the Pacific Electric Railway, Chicago Surface Lines, Cincinnati Traction Company, American Railways, Kansas City Railways, Terre Haute, Indianapolis & Eastern, Union Traction of Indiana, Indianapolis & Cincinnati Traction Company, the Boston Elevated and the Long Island Railroad.

The manufacturers point out that the Davis wheel is an example of the product of highly perfected wheel foundry practice. The tread of the wheel is cast of manganese steel. It has a hardness midway between that of a chilled cast-iron wheel and that of a rolled wheel. The manganese steel gives to the tread and flange qualities of ductility and toughness combined with high tensile strength. The hub and plate are soft steel. The chief claim for this type of wheel is its large mileage on one wear, without turning, grinding or other maintenance expense. These wheels are said also to be about 20 per cent lighter than other wheels designed for the same service.

The principle of a one-wear wheel is reported by Mr. Middleton to have met with especial favor by electric railways. The uniform diameter assures that couplers, platform and step height can be maintained practically constant; that motor and gear case clearances remain uniform and the motor load and speed characteristics remain the same throughout the life of the wheel. This is particularly important in alternating-current service. Elimination of wheel turning reduces the number of changes and results in a reduction of motor and journal bearing expense as well as gear and pinion expense.

The special tough ductile material in the tread of the wheel and the fact that the wheels are ground round before shipment give this type of wheel, according to its manufacturer, less tendency for slid-flat wheels. Also, if one occurs, the flat spot will roll itself out as in wrought steel wheels. The price of the Davis one-wear manganese steel wheel is about the same as that of the wrought steel wheel. The delivery situation is not so good now as it was before the steam roads placed their large freight car orders in the fall. However, shipments of quantities for electric railway use can be made in from four to five months.

Anti-Friction Center and Side Bearing Business Growing

Many Tests and Studies Being Made—Special Type of Side Bearing Now Available for Maximum Traction Trucks

The present widespread interest in side and center bearings for electric railway car trucks is no doubt due to the prevailing high prices of wheels and of labor for making wheel changes. Any device now merits attention that will decrease rail and wheel wear, and lessen the number of pull-ins for wheel renewals.

According to W. McK. White, of Holden & White, Chicago, general sales agents for Hartman center bearings and Perry side bearings, "the merits of anti-friction bearings have been recognized in the past by mechanical engineers, but the actual interest in buying is now greater than ever before in the electric railway industry. Many roads have carried on studies to determine the reduction in wheel wear due to the use of self-aligning truck bearings. One of the most notable of these tests was made by a steam road. It was found that a certain class of engines could pull sufficient additional tonnage on a train equipped with anti-friction bearings to pay for the entire truck-bearing equipment out of the savings in one run of 1000 miles. As a result of this test the Pittsburgh & Lake Erie in December placed an order for 2000 car equipments of Hartman center bearings. The self-centering action of this center bearing offers resistance to truck turning, but that resistance does not equal the resistance of a friction plate. At the same time the nature of the action does prevent the truck from flapping from rail to rail at high speed."

Mr. White states that while a great many center bearings in the past have been installed under electric railway cars, the Hartman bearing is the first with balls larger than 2 in. in diameter to be offered to the electric railways. The large-size ball permits a raceway that carries the load over two-thirds of the circumference of the ball. This design is said to eliminate pitting in the raceways.

Holden & White have made sales of anti-friction center or side bearings to about thirty-five electric railways for initial installations to determine service results and also have sold such bearings in larger quantities to thirty other electric roads. The Chicago Elevated Railways have 500 sets of side bearings installed. Another large user is the Des Moines City Railway. These center and side bearings in their present form were first offered to the electric railways in February, 1916.

Inquiries and prospects according to Mr. White indicate that the sales for 1917 will show a large increase. The manufacturers have been fortunate in being able to make prompt deliveries throughout the past year. Manufacturing costs have forced an increase of about 20 per cent in the selling price. The cost of the steel balls alone has increased 112 per cent. A large part of the sales of these center and side bearings has been for equipping new cars. Mr. White said, "There does not seem to have been a widespread desire on the part of the electric railway managements to install anti-friction bearings on old trucks, even though special bearings have been designed for some types, such as the maximum traction truck. This side bearing for the maximum traction truck is anti-friction both as to load and torque. A number of roads, very recently, have shown special interest in this bearing. It is recognized that there is more friction loss in turning a maximum traction than any other type of truck. This is particularly true on the older maximum traction trucks where no center bearings were used and where the weight and turning efforts had to be carried on bronze shoes in channel-section raceways. The special traction, anti-friction side bearings will greatly decrease the liability for derailment as well as reduce flange wear, and in turn reduce the power required for driving the car. These facts, we believe, will bring about the introduction of anti-friction truck bearings on old as well as new cars. The investment immediately produces economies in operating costs."

CURRENT PRICES FOR MATERIALS

Quoted Wednesday, Feb. 21

Copper (electrolytic)	New York, 36½ cents per pound
Rubber-covered wire (base)	New York, 40 cents per pound
No. 0000 feeder cable (bare)	New York, 37½ cents per pound
No. 0000 feeder cable (stranded)	New York, 35 cents per pound
No. 6 copper wire (insulated)	New York, 37½ cents per pound
No. 6 copper wire (bare)	New York, 37 cents per pound
Tin (straits)	New York, 50½ cents per pound
Lead	New York, 9¾ cents per pound
Spelter	New York, 10¾ cents per pound
Rails, A. S. C. E., O. H	Mill, $40 per gross ton
Rails, A. S. C. E., Bess	Mill, $38 per gross ton
Wire nails	Pittsburgh, $3 per 100 pounds
Steel (bars)	Pittsburgh, 3¼ cents per pound
Sheet iron (black, 24 gage)	Pittsburgh, 4.65 cents per pound
Sheet iron (galv., 24 gage)	Pittsburgh, 6.30 cents per pound
I-beams over 15 in.	Pittsburgh, 10 cents per pound
½-in. galv. extra high strenfith steel wire,	New York, $6.82 per 100 ft.
⅜-in galv. high strength steel wire	New York, $3.41 per 100 ft.
⅝-in. galv. Siemens-Martin wire	New York, $2.52 per 100 ft.
5/16-in. galv. Siemens-Martin wire	New York, $1.94 per 100 ft.
Galvanized barb wire and staples	Pittsburgh, 3.85 cents per pound
Galvanized wire (ordinary)	Pittsburgh, 3.65 cents per pound
Cement (carload lots) with rebate for sacks,	New York, $2.02 per barrel
Cement (carload lots)	Chicago, $2.06 per barrel
Cement (carload lots)	Seattle, $2.60 per barrel
Sand in large lots	New York, 50 cents per ton
Linseed oil (raw, 5-bbl. lots)	New York, 94 cents per gallon
Linseed oil (boiled, 5-bbl. lots)	New York, 95 cents per gallon
White lead (100-lb. keg)	New York, 9¾ cents per pound
Turpentine (bbl. lots)	New York, 51½ cents per gallon

OLD METAL PRICES

Copper (heavy)	New York, 29 cents per pound
Copper (light)	New York, 24 cents per pound
Red brass	New York, 19½ cents per pound
Yellow brass	New York, 18 cents per pound
Lead	New York, 7½ cents per pound
Zinc	8 cents per pound
Steel car axles	Chicago, $34 per net ton
Iron car wheels	Chicago, $18 per gross ton
Steel rail (scrap)	Chicago, $24.50 per gross ton
Steel rail (relaying)	Chicago, $34 per gross ton
Machine shop turnings	Chicago, $9.25 per net ton

Car Orders Largest Since 1906

Annual Report of Pressed Steel Car Company Shows Marked Advances for Year 1916

The gross sales of the Pressed Steel Car Company, New York, N. Y., for 1916 amounted to $31,202,646 as compared to $17,492,620 in 1915. The highest preceding totals were $27,975,978 in 1910 and $30,967,359 in 1913. In the last year the net profits derived from operations, interest, dividends and all other sources, after deducting $425,678 for repairs and renewals to buildings and machinery, were $3,051,152, as compared to $1,517,457 for the previous year. After deducting $1,406,250 for preferred and common dividends at 7 per cent and 4¼ per cent respectively and $300,000 for depreciation out of the 1916 earnings, $1,344,902 was added to working capital, including surplus and undivided profits.

According to the annual report of the company, the buying movement for domestic cars dropped off early in 1916 and was not resumed until the latter part of September. The orders placed for the entire year, however, were larger than those placed in any year since 1906. The failure of the railroads to purchase more cars may be accounted for in part by the agitation of their employees for increased wages and in part by the increased costs of everything in use. It is believed, however, that if an account could be kept of the business losses caused by failure to receive materials on time and the losses caused by congested terminals and embargoes, the sum of these would greatly exceed the amount required by the railroads to provide and maintain ample equipment and adequate terminal facilities.

The company, it is said, enters 1917 with a comfortable order book, mostly domestic, but the financial results for the year will largely depend upon its ability to secure a regular supply of raw materials and labor. It is felt that domestic business has gained such an impetus that there will be an increased demand for equipment, both at home and abroad, regardless of an immediate or delayed peace in Europe.

B. F. Wood, Engineers, Incorporated

B. F. Wood, Engineers, Inc., has been organized with headquarters in the Woolworth Building, New York, to investigate, design and construct engineering works in power development, transmission, railroad electrification, electric railways and lighting system and industrial plants. Benjamin F. Wood, president of the company, was born Feb. 29, 1872, in Fayetteville, Ark., and in 1893 graduated in the course of electrical engineering from the University of Arkansas. The next five years were spent in practical work with various companies. On Jan. 1, 1898, he entered the service of the Pennsylvania Railroad at Altoona, Pa., soon afterward being given the title of assistant engineer. In that capacity he had charge of the electrical work east of Pittsburgh, Pa., including the design and construction of power houses and of principal terminals, among which were the Pittsburgh Station and the Union Station in Washington, D. C. He was a member of the electrical and mechanical advisory committee for the railroads of the New York extension. This committee had general supervision of the mechanical features of the tunnels, the new Pennsylvania Station in New York City and the Long Island City Power Station and the motive-power facilities of Sunnyside yards. While with the Pennsylvania Mr. Wood made reports on the electrification of a low-grade freight line and two main line divisions over the Allegheny mountains at Altoona. In 1913 he became associated with the United Gas & Electric Engineering Corporation as vice-president and chief engineer, and had general supervision of the engineering work on the various subsidiary properties of this corporation. Mr. Wood is president of the United States Reduction Company and a director in the Texas Iron & Steel Company. He is a member of the A. I. E. E. and of the A. S. M. E. and also a member of the electrification committee of the N. E. L. A. and of the power station committee of the A. I. E. E.

Walter E. F. Bradley, vice-president of the company, was born in New York City, Feb. 26, 1883. He attended Columbia University and graduated in electrical engineering in 1905. He first took up experimental work and later was connected with Peter Cooper Hewitt. In 1907 he became a member of Charles S. Bradley & Sons, and in 1913 again returned to Peter Cooper Hewitt as engineer.

Alonzo B. Bradley, secretary and treasurer, was born in Avon, N. Y., Jan. 21, 1880. He graduated from Columbia University in electrical engineering in 1903 and entered the employ of the General Electric Company. He next was employed by American Telephone & Telegraph Company and left this company to become a member of Charles F. Bradley & Sons. For the last four years he has been connected with the C. N. Hunt Company.

ROLLING STOCK

Trenton & Mercer County Traction Corporation, Trenton, N. J., is in the market for ten double-truck city cars.

New York State Railways, Rochester Lines, Rochester, N. Y., is reported to be in the market for twenty-five city cars.

International Railway, Buffalo, N. Y., has purchased from the G. C. Kuhlman Car Company fifty single-end double-truck cars for city service.

Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., noted in last week's issue as being in the market for four cars, has placed the order with the Wason Car Company.

Austin (Tex.) Street Railway, noted in the ELECTRIC RAILWAY JOURNAL of Feb. 3 as purchasing four one-man pay-as-you-enter cars from the American Car Company, has specified the following details for this equipment:

Builder of car body	American Car Company
Type of car	Single-truck, one-man, pay-as-you-enter
Seating capacity	32
Weight (total)	15,000 lb.
Length over bumpers	30 ft. 1 in.
Length over vestibule	29 ft. 1 in.
Width over all	8 ft. 1 in.
Height, rail to trolley base	10 ft. 1 in.
Body, wood, semi-steel or all steel	All steel
Interior trim	Cherry
Headlining	Agasote
Roof, arch or monitor	Arch
Air brakes	Westinghouse and General Electric
Axles	Brill
Curtain fixtures	American Car Curtain Supply
Curtain material	Pantasote
Door operating mechanism	Safety Car Devices
Fare boxes	Johnson
Fenders or wheelguards	H. B.
Gears and pinions	General Electric
Hand brakes	American Car
Headlights	Golden Glow
Motors, type and number	2 G.E.—258A
Motors, outside or inside hung	Inside
Paint, varnish or enamel	Paint and varnish
Registers	International
Sash fixtures	Brill renitent
Seats, style	Brill reversible
Seating material	Cherry wood
Step treads	Feralun
Trolley catchers	Keystone
Trolley base	G. E. ball bearing
Trucks, type	21 E, American Car
Ventilators	American Car
Wheels (type and size)	24 in. cast iron

TRADE NOTES

Precision Instrument Company, Detroit, Mich., announces that the Vincent & Gilson Engineering Company, 30 Church Street, is representing them in New York City.

Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., announces that its New York office has been moved from 15 Wall Street to the City Investing Building, 165 Broadway.

S. A. Megeath has resigned as president and general manager of the Galena Signal Oil Company in order to devote his attention exclusively to the refining and foreign branches of the business. He has been succeeded as president by his father-in-law, General Charles Miller.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., announces that it has combined offices with the Westinghouse Lamp Company in San Francisco. The new offices, which are located in the First National Bank Building, will be in charge of C. E. Heise, district manager.

Stroh Steel-Hardening Process Company, Pittsburgh, Pa., announces that it has opened offices at 728 Monadnock Building, Chicago, Ill., in charge of F. Floyd Mark, Western sales manager. This company's steel castings, which are made by a special process, are in general use in the steel, cement and mining industries.

Bonham Recorder Company, Hamilton, Ohio, announces the completion of its organization with the election of the following officers: president, E. E. Dwight, president Tool Steel Gear & Pinion Company; vice-president and general manager, G. Y. Bast; secretary and treasurer, C. S. Wilson; mechanical engineer, L. Bonham. The first three named and J. E. Stacey and C. A. Wilson form the board of directors of the company.

W. S. Barstow Management Association, New York, N. Y., has been incorporated and will supervise the management of all public utilities properties controlled by the General Gas & Electric Company, the Eastern Power & Light Corporation and W. S. Barstow & Company, Inc. E. L. West has been elected president of the new corporation, the offices of which are at 50 Pine Street, New York City.

Frank M. Erb, formerly superintendent of production, R. D. Nuttall Company, has severed his connection with that company. He will open an office in the Second National Bank Building, Pittsburgh, Pa., on or about March 5, as a manufacturers' district representative and will handle castings and forgings. Among the companies he will represent are the National Forge & Tool Company, Erie, Pa., the Silver Manufacturing Company, Salem, Ohio, and the Standard Steel Casting Company, Cleveland, Ohio.

Standard Underground Cable Company, Pittsburgh, Pa., announces that at the January meeting of the board of directors Charles J. Marsh was elected a vice-president of the company. Mr. Marsh is a brother of Joseph W. Marsh, president of the company, and has for many years been manager of the eastern and northeastern sales departments and also principal metal buyer of the company, with headquarters in New York City.

Canadian Westinghouse Company, Ltd., Hamilton, Ont., Canada, at the recent annual meeting of the board of directors elected Paul Judson Myler president. H. H. Westinghouse, retiring president, was elected chairman of the board. Mr. Myler was born in Pittsburgh, April 24, 1869. He was educated in the public schools of Pittsburgh, graduating from the Pittsburgh Central High School. In 1886 he entered the employ of the Westinghouse Air Brake Company as bill clerk in their Allegheny shops, and in 1896 he was appointed secretary of the Westinghouse Manufacturing Company at Hamilton, Ont., Canada. The following year he was made secretary-treasurer. In 1903 the company was reorganized as the Canadian Westinghouse Company and Mr. Myler was made vice-president and general manager.

ADVERTISING LITERATURE

Beaudry & Company, Inc., Boston, Mass., have just issued a twenty-page booklet on their belt and motor-driven power hammers.

Central Electric Company, Chicago, Ill., has issued bulletin No. 60 on its Max-o-lite fittings for shops, freight sheds, warehouses, terminals, factories, round houses, docks and yards.

Precision Instrument Company, Detroit, Mich., has issued a loose-leaf catalog entitled "Precision." This catalog contains bulletins on CO_2 Combustion Recorders, "Pico" Gages, Indicating and Recording Precision Gages, Precision Micrometer Gages, U Type Gages, Precision Efficiency Kit, Gas Collectors, and Water Meters.

Youngstown Sheet & Tube Company, Youngstown, Ohio, manufacturer of iron, steel and other products, has issued an attractive calendar for 1917. This calendar contains twelve large two-color photographic views showing the processes used in the manufacture of pipe and other products.

National Tube Company, Pittsburgh, Pa., is distributing a 200-page appendix to its book of standards which was distributed in 1913. This publication has a widely acknowledged value, as evidenced by the constantly increasing requests for copies from technical and practical engineers, mechanical men, manufacturers, students and others interested in pipe and allied products.

NEW PUBLICATION

Investigation of Cartridge Enclosed Fuses. Bureau of Standards Technologic Paper No. 74. Government Printing Office, Washington, D. C. 224 pages.

The Department of Commerce has issued this report on the "Economy" refillable fuses based on elaborate investigations. The bureau's investigation showed that this type of fuse when new and properly filled or refilled operates satisfactorily under the most common working conditions of overload and moderate short circuits when in circuits with low inductance, and possesses some marked advantages over the approved fuses with which it has been compared. The bureau recommends, however, that these fuses be not approved at present for general use on the same basis as fuses at present listed as standard by Underwriters' Laboratories (Inc.), but that their use be permitted by municipal and underwriters' inspection departments under conditions where the performances can be observed by each inspection department until sufficient experience regarding their performance under service conditions can be obtained to justify an unqualified approval or refusal to approve.

Copies of the paper may be obtained by addressing requests to the Bureau of Standards. Additional copies can be secured at fifty-five cents each from the Superintendent of Documents, Government Printing Office.

Electric Railway Journal

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THAT PAVING BURDEN AGAIN

That the ELECTRIC RAILWAY JOURNAL is on the right track in urging the urban railways to press for relief from the inequitable taxation involved in paving requirements was indicated by the discussion at the New York Electric Railway Association meeting in New York City last week. Amid the clouds of difficulty which hang over the industry in its attempt to meet the contending requirements of public and capital a ray of light comes in the form of a hope that the paving conditions may be ameliorated and expenses thus considerably reduced. The discussion at New York, however, showed clearly that this relief will not come suddenly or without patient effort. The paving requirement is in many cases, in most cases, presumably, a contractual obligation specifically tied in with the franchise grant. It is therefore not to be expected that changes can easily be made, although with the expanding powers of commission rule in most states and under the theory held in the recent New York and North Shore decision, it may be that commissions can relieve individual companies of this burden without legislation, where the circumstances of the case warrant action. In the meantime the local public must be brought to see the light. Firm conviction as to the correctness of the contention that the present paving requirements are unjust, backed up with persistence and ingenuity in spreading this conviction to the communities served will ultimately bring relief. The outcome of such cases as that cited by T. A. Wright, Jr., referred to in the account of the New York meeting elsewhere in this issue, will have far-reaching effect, especially if favorable to the railways. The executive committee of the New York Association is planning to give this matter careful consideration. Undoubtedly the support of powerful associations like this would tend greatly to accelerate the movement.

STANDARDIZATION A TIME-CONSUMING PROCESS

The experience of the American Electric Railway Engineering Association in the matter of standards has proved several things conclusively. Probably the most important of these is that it takes more than the fiat of an association to cause standards to be adopted. It is evident that the desire for standardization is but one among a number of forces tending in the desired direction. The big problem is to coordinate these forces, and the committee on standards has this function to perform. Another lesson is that the attempt to standardize furnishes the stimulus for gathering and systematizing technical data. It follows that, in approving recently a plan of standards adoption which, except in unusual cases, requires more deliberation than formerly, the executive committee of the Engineering Association showed its recognition of the above facts. The purpose of the new plan is, among other things, to prevent the adoption of standards too far in advance of present practice to render their early adoption probable. In the past, standards have undoubtedly been adopted in some cases on their merits without much chance of early adoption, in the hope that they could exert a powerful influence to rationalize existing practice. The result has been a general complaint, on the part of those interested in the adoption of the standards, that the industry is slow to appreciate the merits of reasonable uniformity.

DELIBERATION WILL EXPEDITE STANDARDIZATION

The complaint that the work of the association has not produced all of the salutary effect desired, is, of course, justified in the light of the facts, but it must be remembered that there are in many cases conditions other than the desire for standardization which are controlling. There is not a shadow of doubt that standardization produces economy for the same fundamental reason that articles can be produced cheaper in a factory than they can in a repair shop. To exaggerate conditions a bit it is self-evident that each of a million articles can be made cheaper than each of a dozen, because tools and methods of an entirely different character must be employed. But complete standardization in track, rolling stock, equipment, etc., is an ideal still remote while the industry is as mobile as it yet is. The new procedure provides normally for five stages in the evolution of standards, namely; study and formulation by the appropriate technical committee, reference to the membership for comment and criticism after consideration by the standards committee, reconsideration by the technical committee and return to the standards committee for review one year after first review by this committee, and finally reference to the convention. This is the normal route for worthy recommendations which may reasonably be expected to meet with approval. Immature propositions will have to travel a more difficult road or be side-tracked en route. The new procedure will require a proposed standard to be kept before the attention of the membership long enough to have its weak spots made perfectly apparent. When it finally gets before the convention it is to be presented by the standards committee and there will be ample opportunity for discussion before it is adopted. It is expected that with the completion of the Engineering Manual re-

vision now under way and the adoption of a more deliberative procedure in making future additions, there will be less justification in the future for complaint that the association standards are not potent, because they will be closer to the field.

THE ADVERTISING POLICY OF "AERA"

In our issue of Feb. 24 we published the reports of the sub-committee appointed to consider the advertising policy of *Aera*, and explained why we agreed with the minority report submitted by Colonel Williams and Mr. Tripp. Further reasons against the present policy of *Aera* are presented in our department of Communications this week by Colonel Williams and Mr. Mortimer. Colonel Williams lays stress on two objectionable features of the publication. The first is "the potent but silent influence," mentioned in the Boston report, exercised by the association in securing contributions in the guise of advertising to cover the cost of publication. In his letter of this week Colonel Williams says: "I do not believe that the association should stand behind such a departure from right principles." Aside from this phase of the matter, he also questions the advisability of invasion of the field of electric railway journalism by the association in competition with private enterprise, and expresses the thought that the influence on public opinion which springs from an outside independent source is more powerful than that of a publication issued by the industry itself.

Mr. Mortimer points out that although the deficit from the publication of *Aera* last year was only a little more than $4,000, the actual cost to the industry was, of course, the entire expense of the publication. If manufacturers have to advertise in the magazine to help defray its cost they must raise their charges for apparatus a corresponding amount, so that the railway companies ultimately foot the entire bill. This means that the railways paid for the magazine last year $21,742.91, and since it was started the sum of $72,918.26. Detailed figures of the expenses up to date have not been published by the association, but of the total earnings of the magazine from Aug. 1, 1912, to May 31, 1916, or $40,881, 57 per cent, or $23,648, had gone to pay the traveling expenses and salaries of the editor and advertising solicitor. During the twenty months ended May 31, 1916, these expenses were even higher, being 70 per cent of the total earnings. While an experienced editor would probably still be required on the secretary's staff, if the practice of carrying advertising was discontinued, much of his time could be devoted to the development of public relations and informational work, and to general publicity, so that the cost chargeable to the publication would be small. Other savings in cost of composition, paper, binding and mailing would naturally result from the elimination of advertising and technical articles from the publication. These are strong reasons for the change to a "bulletin," as recommended by Colonel Williams and Mr. Tripp in their Boston report.

The cost for printing and mailing such a monthly bulletin containing sixty-four pages and cover, with an edition of 5000 copies, has been estimated as $6,000 a year. According to the majority report of the *Aera* subcommittee printed last week, the circulation of *Aera* among members of the various classes is about 5000, and the revenue at $2 per subscription from such members for the fiscal year ended Oct. 31, 1916, was $9,653.70. This seems to be the income against which the cost of the bulletin at $6,000 a year could be charged.

Independently, however, of what the actual cost of *Aera* is to the industry, if it involves duplication of work now done by other agencies it represents a waste of effort and money. Waste is always expensive, no matter how little it actually costs. As Mr. Mortimer says, concentration of production and mobilization and correlation of resources are the watchwords of the day. This is as true in the activities of the association as in that of any individual company.

RESERVOIR STATIONS FOR SUBWAYS

In a report on the proposed rapid transit plan for the City of Sydney, New South Wales, which was published in abstract in our last issue, special consideration was accorded to the use of bifurcated tracks, or reservoir stations, for limiting the effect of the station stop upon the headway between trains. The Sydney plan seems, in fact, largely dependent upon this method of operation, because if three tracks were installed, instead of the two now proposed, the necessity for cross-overs from track to track would seriously hamper the operation of the subway loop which has to be installed in order to serve the congested business district of Sydney. Thus the two-track arrangement with reservoir stations is estimated to have actually about 50 per cent greater capacity than a plain three-track loop. In the light of this finding, a question naturally arises as to the reasons why the reservoir-station principle should have been undesirable for the new subways in New York City, since the scheme was considered in detail at the time when these lines were being planned.

Based upon the broadest of generalizations it may be said that the decision not to use reservoir stations in New York was that extreme concentration of traffic upon any particular line was considered to be contrary to the local needs. Instead, it was desired to provide separate lines serving as diversified territory as possible and collecting traffic throughout their whole length rather than at the end, and since there exists in Greater New York no central district of small area and extreme congestion around which all trains must be routed, as is the case in Sydney, intensive operating methods were not essential. On financial grounds also, examination of the reservoir-station plan as applied in New York disclosed the fact that the first cost of the installation would have been all out of proportion to any possible returns that could be expected from it with the system of separated lines that had been laid out. In addition to the difficulties of construction there was added the limited width of right-of-way (since the generally-used four-track arrangement took up practically the whole width of street), and it was necessary in practically all cases to estimate on two-level stations with which the bifurcation of tracks would have to be made in a vertical plane instead of in a horizontal plane as proposed for Sydney. It was considered, however, that the principle of the reservoir station was perfectly practical and that, with proper safeguards in the form of automatic stops or speed control, no element of hazard could be introduced by its adoption.

Thus there would seem to be a definite place for the principle to be applied, this being in locations where track congestion is inevitable and at particular stations where, because of an abnormal extent of passenger interchange taking place regularly during the peak, the stops are unduly long.

In brief, what the scheme accomplishes is to cut in half the headway permitted by the conditions at any station where it is installed, this applying in all cases where the original headway is more than sixty seconds. For headways less than this, under ordinary conditions of acceleration, braking and train-length, a decrease in headway may be effected, but not at the same rate as when the original headway is relatively long on account of a long station stop.

PREPAREDNESS AS A PRACTICAL PROBLEM

Specific steps in preparedness are of interest to not a few electric railway managers who desire to set their houses in order to meet future contingencies of a military character, if such eventuate. Elsewhere in this issue we publish an account of an electric transportation preparedness program now under way in Massachusetts, which is of significance to many other companies than those directly concerned in the inquiry for data of military value. Over and beyond the points outlined are many other questions which must be answered by individual managers and superintendents, and foremost among these is the question as to how electric railway properties are to be run and how they can prepare to meet their local requirements under the stress of military conditions.

Experience abroad since the outbreak of the war furnishes suggestions to American traction companies. Obviously the demand of the field forces for men, if a general call to the colors should come, would impose a severe handicap upon operating organizations unless some anticipation of the reduction in personnel were carefully considered. If their military services were needed it is fair to assume that electric railway trainmen in this country would be as ready to go to the front as they have been in our neighbor to the north. So far as we know no statistics have been compiled to show how extensive these enlistments have been, but individual electric railway companies have reported that the quota was as high as 25 per cent of the entire force. In many respects, as we have previously pointed out, the railway trainman and official should be able to adapt themselves to military life more easily than many other civilians. Nor will the fact that a man is beyond the usual rifle-bearing age prevent him from serving the nation in time of need. There will be a call for expert assistance in transportation, accounting and engineering problems, in which the training which railway men have received will be very useful.

In case of war, many companies now requiring applicants for employment to pass a stiff physical examination might very properly relax these standards for the conditional acceptance of men, especially with respect to those above the more desirable military ages. By endeavoring to hire men above the usual age limit, companies will not enter into competition with the government. Many conditional acceptances can doubtless be obtained from the files of street railway employment departments which record the names and addresses of applicants previously rejected on account of such causes as physical condition, poor eyesight, height, imperfect hands, etc. Immediate steps in the direction of breaking in on the front end car conductors, shifters, and other employees suitable for motormen's service are important. The employment of women in place of porters, car cleaners, conductors, clerks of various kinds, and in certain branches of shop practice is obviously a feasible program to plan for prompt adoption in case of necessity. It is useful to list all employees having mechanical ability in case it becomes necessary to draft them for car repairs, power station work, etc., in the event of an emergency.

On large systems the preparation of war timetables may well receive attention, and where agreements are in force with the unions respecting hours of labor and working conditions, conferences looking toward the temporary abrogation of such agreements in the interests of patriotism may be in order, subject of course, to the actual breaking out of hostilities. Certain industries may be ordered by the public authorities to change their hours of labor in order to break shifts in the normal hours of the day and spread out the peak, thereby making it possible to handle the traffic with a reduced service. We need not emphasize the importance of inaugurating a systematic plan for the protection of all power plants, shops, wharves, coal piles, carhouses, company storehouses, garages, substations, important junction points of main conduit lines, etc.; the photographing of all employees supplied with passes to visit these points, appointment of special police, and the like, either in conjunction with or supplementing the work of the public authorities. A point of great importance in these days is to look with the utmost care into the antecedents of all applicants for positions in power plants or other places where only loyal citizens of this country should be allowed to work; in fact a careful investigation of the nationality, history and general character of every person employed in departments where the opportunity might arise to cripple operation is highly essential. Reductions in sick leave and in the amount of maintenance work performed also suggest themselves as advantageous steps, should the country actually be forced to enter the field of hostilities.

Recent Power Supply Developments at Manchester

The Author Describes the Extensive Improvements, Including a Steam Generating Station, Substations and Transmission Lines, Recently Completed by the Manchester (N. H.) Traction Light & Power Company to Meet a Rapidly Growing Electrical Load Throughout the District That It Serves

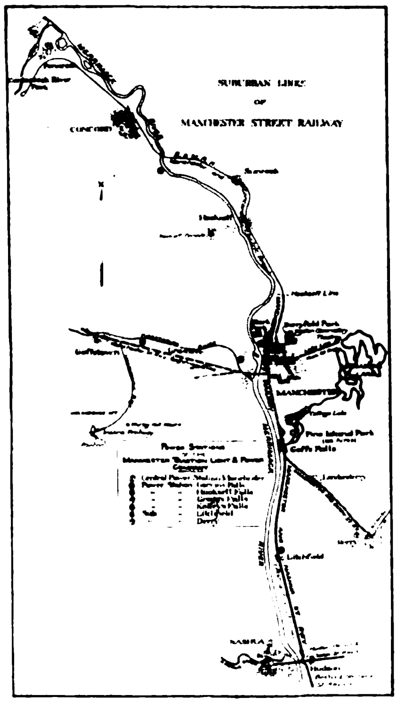
By F. C. DOBLE
Of Hollis French & Allen Hubbard, Consulting Engineers, Boston, Mass.

THE Manchester Traction, Light & Power Company has completed during the past year the second step in its extensive power-development project, consisting of one unit of a new steam-generating station at Kelleys Falls, Grasmere, N. H., and two 33,000-volt substations at Kelleys Falls and Garvins Falls, together with a building at Brook Street, Manchester, combining a lighting substation for alternating current and a street railway direct-current substation under the same roof. In addition, the company has built a steel-tower, 33,000-volt transmission line from Garvins Falls to Kelleys Falls, and has installed extensive underground work in the city of Manchester.

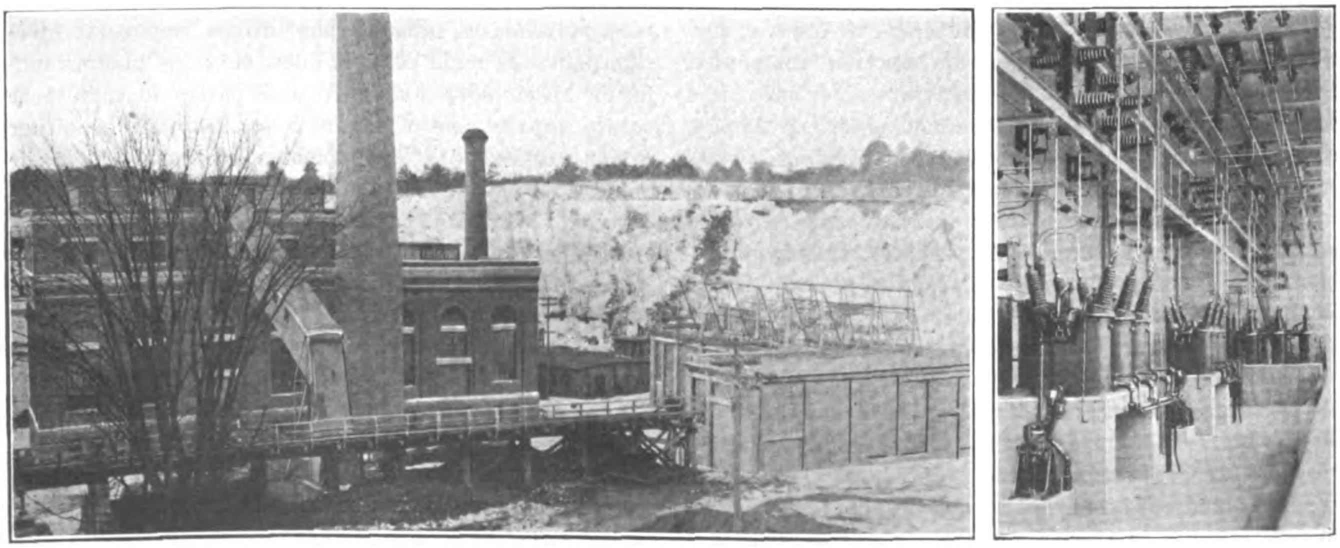
The present company is the outgrowth of a company chartered in 1881 as the Manchester Electric Light Company which, several years later, was changed in name to The Manchester Electric Company. The latter now supplies all the commercial electric power sold over a territory containing more than 1000 square miles, as well as controlling by stock ownership three street railway systems, namely, the Manchester Street Railway, the Manchester & Derry Street Railway and the Manchester and Nashua Street Railway. These properties aggregate 64 miles of track.

The single-line diagram on page 425 shows the Manchester Traction, Light & Power Company's transmission system as it existed for several years previous to the present developments. With this plant the hydroelectric stations shown at Garvins Falls, Hooksett, Greggs Falls and Kelleys Falls transmitted power over 11,000-volt, circuits to Brook Street as a center.

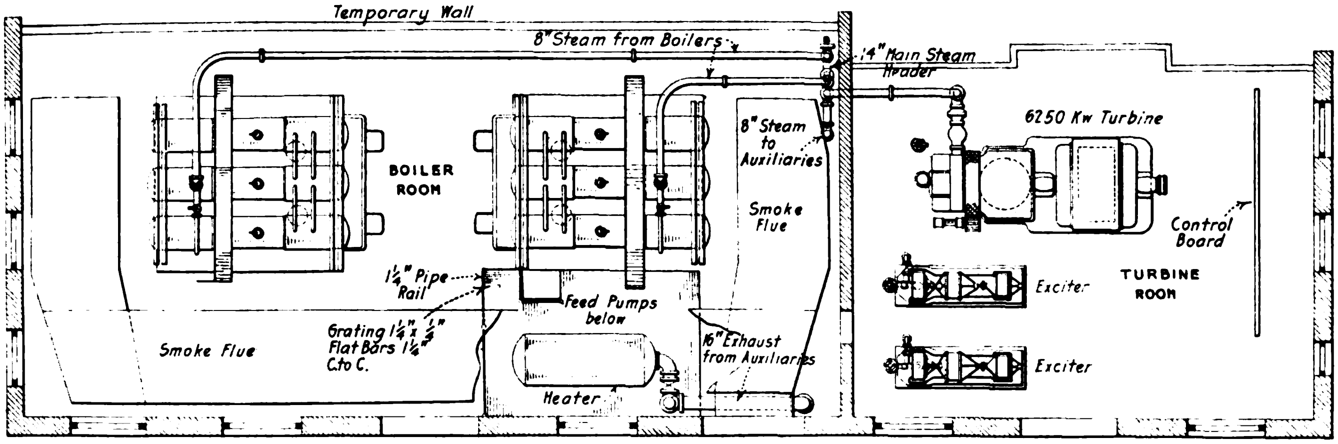
On another line-cut is shown in full lines the work covered by the two developments that have just been completed. Of these, the 1914-1915 work, which comprised the first step in the project, consisted in the construction of 18 miles of duplicate 33,000-volt, three-phase, No. 2 copper circuits, mounted on wood poles with occasional steel towers for special conditions and terminated by substations at Kelleys Falls and Nashua respectively. There were constructed, also, 2½ miles of duplicate, three-phase, No. 00 copper circuits, run on steel towers, and designed for 33,000-volt service, but operated temporarily at 11,000 volts. These were connected to the 33,000-volt Nashua lines at Kelleys Falls substation through three 1000-kva. transformers and were tapped directly to 11,000-volt transmission lines



MANCHESTER POWER—MAP OF SYSTEM



MANCHESTER POWER—STEAM PLANT AND SUBSTATION AT KELLEY'S FALLS—ARRANGEMENT FOR 33,000-VOLT OIL SWITCHES


Temporary Wall
8" Steam from Boilers
14" Main Steam Header
BOILER ROOM
8" Steam to Auxiliaries
Smoke Flue
6250 Kw Turbine
Control Board
1¼" Pipe Rail
Feed Pumps below
Grating 1¼" x ¼" Flat Bars 1¼" C. to C.
Smoke Flue
16" Exhaust from Auxiliaries
Heater
Exciter
Exciter
TURBINE ROOM

MANCHESTER POWER—FLOOR PLAN OF KELLEYS FALLS STEAM STATION

from Garvins Falls just outside their entrance to the Brook Street substation.

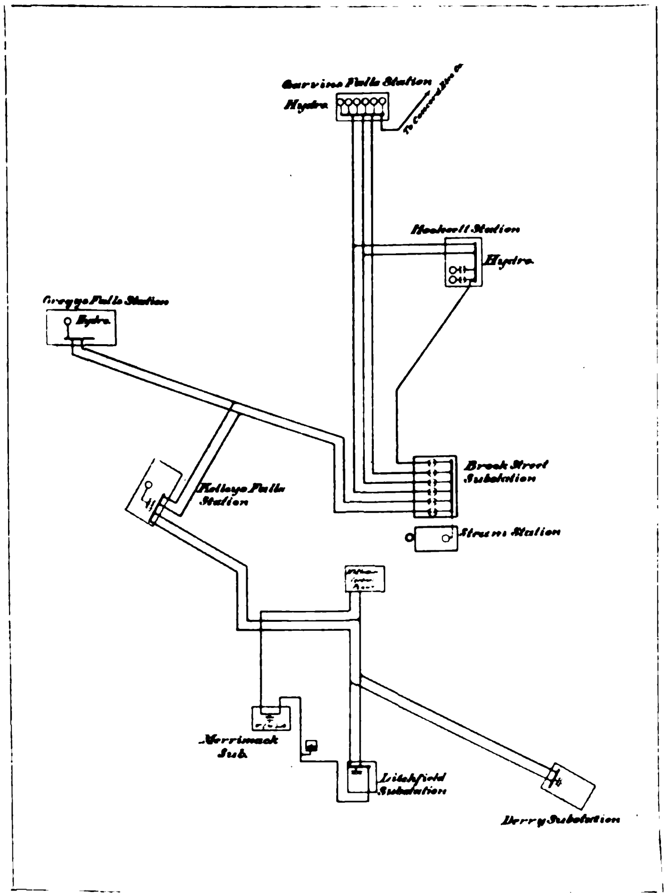
This first development was made necessary by the acquisition of the Nashua Heat, Light & Power Company. In order to shut down the steam station at Nashua, and to supply it with power from the hydroelectric stations of the Manchester Company, a higher voltage had to be adopted for economical transmission of power over the maximum distance of 30 miles from the main generating station at Garvins Falls.

The 1915-1916 work recently completed was made necessary by the rapid growth in the Manchester Traction, Light & Power Company's sales of power, which overtaxed its facilities and called for a much greater steam reserve than had been necessary up to this time. This condition was augmented by the fact that much of the apparatus had become inadequate from age and the transmission lines were in such a condition as to require complete rebuilding.

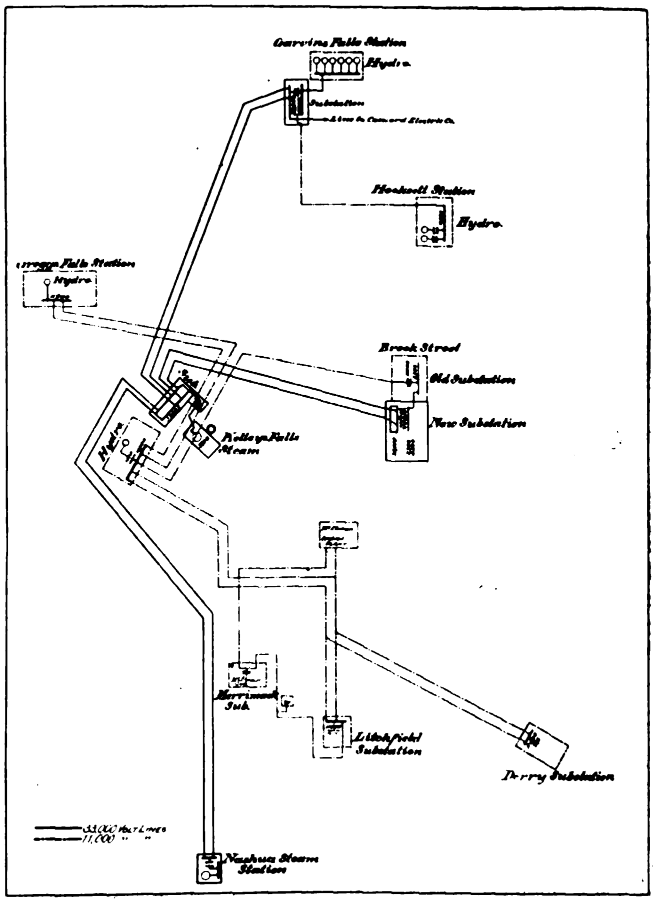
KELLEYS FALLS STEAM STATION

The feature of the second part of the project is the construction of one complete unit of a new steam station at Kelleys Falls. This building is a two-story structure, built with steel frame, brick walls, granite trimmings, concrete floors and roof and steel sash. The west side is temporarily built of corrugated iron to allow for future extensions.

The turbine room contains a 6250-kw. steam turbine made by the General Electric Company. This machine is given an extra 20 per cent capacity by drilling the shaft endwise to permit circulation of water through it to cool the armature windings. Two 100-kw. exciters are provided. Each is normally motor-driven, but has


Garvins Falls Station
Hydro
Hooksett Station
Hydro
Greggs Falls Station
Hydro
Kelleys Falls Station
Brook Street Substation
Steam Station
Merrimack Sub.
Litchfield Substation
Derry Substation

MANCHESTER POWER—DIAGRAM SHOWING ORIGINAL EQUIPMENT


Garvins Falls Station
Hydro
Substation
Line to Concord Electric Co.
Hooksett Station
Hydro
Greggs Falls Station
Hydro
Brook Street
Old Substation
New Substation
Kelleys Falls Steam
Hydro
Merrimack Sub.
Litchfield Substation
Derry Substation
33,000 Volt Lines
11,000 " "
Nashua Steam Station

MANCHESTER POWER—DIAGRAM SHOWING NEW DEVELOPMENTS also a Terry Steam turbine mounted on the shaft and so connected that, in case the motor fails, the steam turbine instantly picks up the load without making appreciable change in the excitation conditions.

Steam is supplied at 200-lb. pressure by two Babcock & Wilcox boilers, set independently, and normally rated at 762 hp. each. By means of Taylor stokers and blowers the boilers can be operated at 250 per cent of rating. The feed pumps are of the three-stage and four-stage centrifugal type. Coal is supplied the boilers from overhead bunkers. These are supplied by belt conveyor, and the coal is fed through automatic weighing machines before reaching the stoker hoppers.

The condensing apparatus, which was furnished by the Alberger Condenser Company, is placed in a pit beneath the turbine. The condenser is of the vertical-jet type with a removal pump incorporated in the base. Circulating water is taken from the adjacent river.

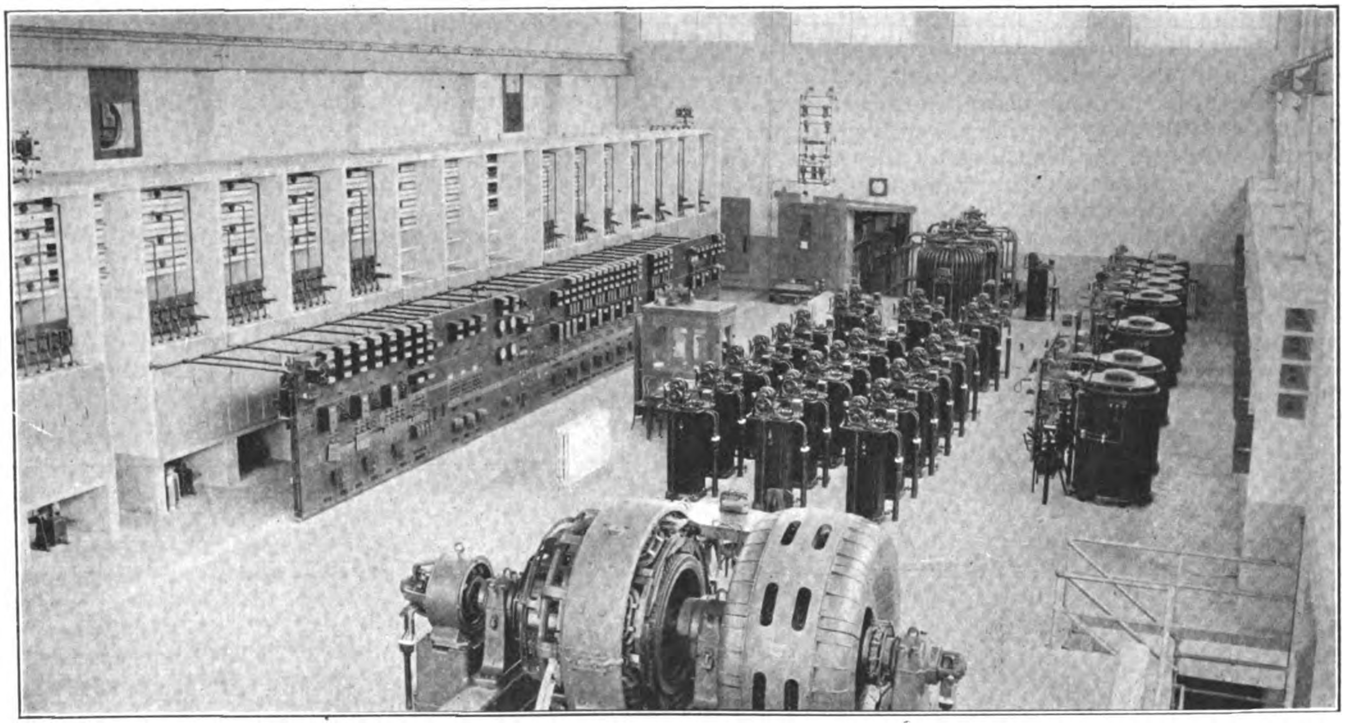
One Custodis chimney has been erected. It is 11 ft. in diameter and 175 ft. high, and is of sufficient capacity to serve an installation double the size of that now in use.

This generating plant is operated in connection with new apparatus that has been installed in the Kelleys Falls substation. To house the new substation equipment two bays were added to the 33,000-volt substation that had been constructed as a part of the first development. These bays provide switching space for connecting the turbine to the high-tension system. Also, in a wing built onto the substation there was installed a bank of three 2500-kva. 33,000/2300-volt, General Electric, self-cooling transformers. The low-tension side of each of these transformers is connected directly by means of cables to the 2300-volt generator in the steam station.

Neither 2300-volt buses nor oil switches are provided in the steam station, the turbine and its transformers being virtually one unit. The reason for the adoption of this scheme, which necessitates that all switching shall be done on the high-tension side of the transformer, becomes apparent when it is shown that the entire present station is but one unit of a possible six-unit future installation. Therefore, the 2300-volt switches on a bus carrying the current of the ultimate installation would have had to be of such large capacity as to make the cost prohibitive.

It should be said here that a new substation has been erected at Garvins Falls to house apparatus for switching and transforming the current that is generated by six 11,000-volt machines in the old station. Power is transmitted at 33,000 volts through two outgoing lines to Kelleys Falls substation.

In addition to the improvements above mentioned, 12½ miles of transmission line, consisting of duplicate 33,000-volt, three-phase No. 00 copper, inverted-delta circuits, has been constructed. This is run on steel poles and towers furnished by R. D. Coombs & Company, New York, and it was installed by the construction department of the Manchester Traction, Light & Power Company. It connects the Garvins Falls and Kelleys Falls substations.

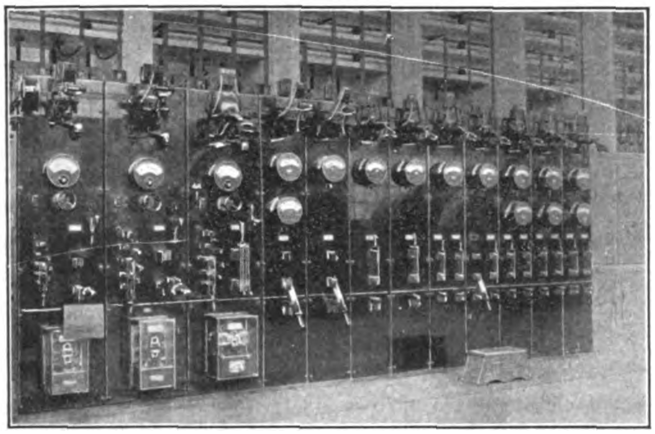


MANCHESTER POWER—MAIN OPERATING ROOM IN BROOK STREET SUBSTATION

BROOK STREET SUBSTATION, MANCHESTER

Much more elaborate extensions than those of the foregoing substations have been made at the company's installation at Brook Street in the city of Manchester. In this substation a high-tension oil-switch room provides for two incoming three-phase, 33,000-volt circuits and connections to three banks of transformers in the transformer room, each bank consisting of three 1000-kva., 33,000-volt, delta-primary windings with 2300-volt delta and 4000-volt star secondaries. One bank of transformers is connected delta-delta and supplies three-wire, 2300-volt commercial circuits. The other two banks are connected delta-star and supply three-wire or four-wire 4000-volt commercial circuits, and also the synchronous motors of the street railway motor-generator sets located in the operating room.

One of the illustrations shows in detail the methods used in terminating the transmission lines by A-frames on the roof of the high-tension switch room and in making connections to outdoor-type aluminum-cell



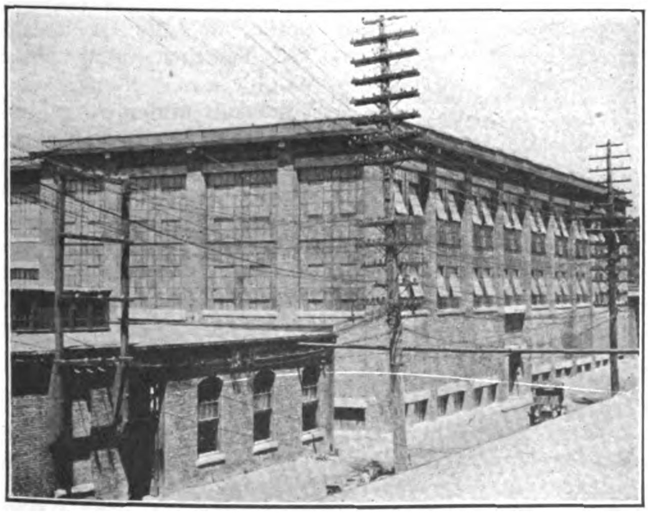
MANCHESTER POWER—RAILWAY SWITCHBOARD AT BROOK STREET SUBSTATION

lightning arresters. Entrance is effected through Thomas roof bushings, and switching connections are made to 33,000-volt ring buses, and then through similar switches to the high-tension delta of the transformers, which is mounted on the wall of the switch room. From the low-tension side of the transformers conductors run through iron conduits to a transfer bus and then to the main bus structure. The concrete bus structure was built by the F. F. Jonesberg Company, Boston. It was cast in place as one solid piece and it accommodates duplicate G.E. K-12 oil switches and bus connections for all 2300-volt and 4000-volt circuits.

The twenty-nine-panel control board, high and low-tension switch gear transformers, and automatic regulators and their wiring were furnished and installed by the General Electric Company. The conduit and station lighting was installed by the Lord Electric Company, Boston.

PROVISIONS FOR RELIABILITY OF SERVICE

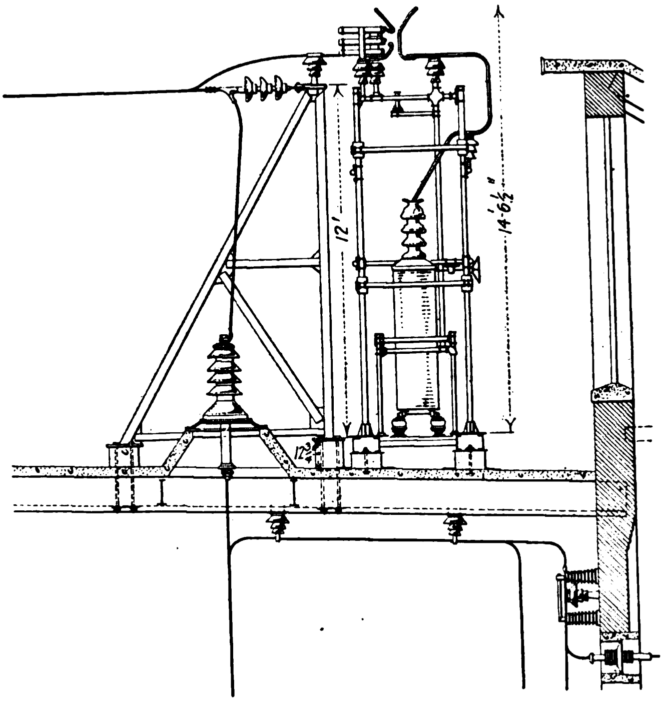
The development as described shows to what great lengths the company has gone in order to provide at Brook Street a reliable source of power for its customers, of whom the three street railway companies are of particular importance. To serve these the company has installed a new 2000-kw., 600-volt Westinghouse motor-generator set, to supersede several small units and supplement the 1500-kw. and 500-kw., 600-volt General Electric motor-generator sets that were previously in service. The motor of the 1500-kw. set has been rewound from 11,000 volts to 4000 volts, and the 500-kw. set has been reconstructed from a 2000-volt to a 4000-volt rating. All three motor-generator sets have synchronous motors now operating on the 4000-volt system in the new station.



MANCHESTER POWER—EXTERIOR VIEW OF ADDITION TO BROOK STREET SUBSTATION CONTAINING CONVERTERS AND TRANSFORMERS THAT SERVE BOTH RAILWAY AND LIGHTING LOADS

The old railway switchboard at Brook Street had both positive and negative buses mounted in back of the panels, with switch connections such that the machines were equalized on the positive side. In the new substation the above-mentioned board is superseded by a modern, General Electric, single-polarity railway board arranged for equalizing machines on the negative side with equalizing buses and negative buses run directly under the machines.

A special feature of this board provides all feeders with double-throw switches which, by means of an auxiliary bus and an extra panel, permit any feeder to be operated through spare circuit breakers on the extra panel while repairs to the regular feeder breakers are being made. All feeder instruments are of the Western Electrical Instrument Company's round pattern.



MANCHESTER POWER—DETAIL VIEW, SHOWING METHOD OF TERMINATING TRANSMISSION LINES ON ROOF OF BROOK STREET SUBSTATION

Another feature of the present development which adds materially to the reliability of the service is a complete underground system for the business section of the city of Manchester. More than half of a long-contemplated conduit installation has been made, and at present the street railway feeders leaving the Brook Street substation run for a considerable distance in the underground system.

The above developments were planned and executed by the firm of Hollis French & Allen Hubbard, Boston, Mass., consulting engineers for the Manchester company. J. F. Wilber was designing engineer in charge of building construction. C. F. Eveleth handled the steam plant design, with the author in charge of electrical design and construction. F. S. Piper, electrical engineer, and R. W. Wilson, construction superintendent of the Manchester company, represented the latter on the entire work.

New York Meeting N. Y. E. R. A.

Taxation, Co-operation with the War Department, Fare Collection, and Surety and Indemnity Bonds Were the Principal Topics Discussed

THE twenty-second quarterly meeting of the New York Electric Railway Association was held at the Hotel Astor in New York City on March 2. The morning session was taken up with committee reports and the reading and discussion of the three papers, abstracted in last week's issue of the ELECTRIC RAILWAY JOURNAL. In the afternoon the discussion centered in discipline. The paper on "Discipline in the Transportation Department," read by H. A. Bullock, Brooklyn, is abstracted elsewhere in this issue. The banquet in the evening was a patriotic affair, with addresses by Public Service Commissioners James O. Carr and Travis H. Whitney, and a graphic account of life in the trenches on the Somme battle front by A. G. Empey, an enlisted soldier in the British Army.

Morning Session

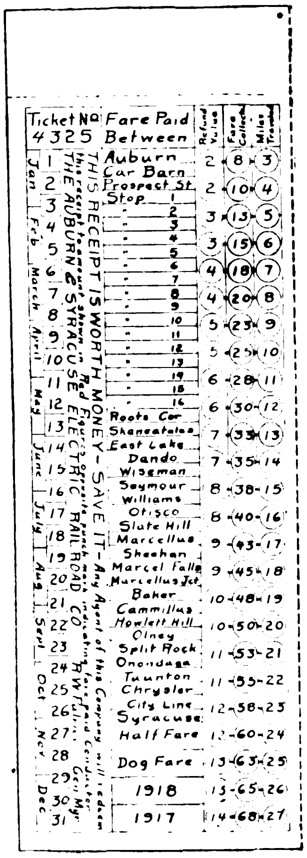
In opening the meeting President J. P. Barnes, Rochester, called first for the reading of reports. That of the committee on standards was presented by W. G. Gove, chairman. The report contained a brief outline or chronological summary of the progress made by the committee to date. It was considered undesirable to recommend standards which do not conform to those adopted by the American Electric Railway Engineering Association, and of these only standards should be recommended which meet the requirements of the members of the New York Association. On account of the proposed changes in the Engineering Manual it was recommended by the committee that its work be continued in order that it might make its final report after the revision of the Engineering Association standards.

For the committee on military operations, Wilbur C. Fisk, New York City, chairman, reported that the committee is awaiting an interview with Daniel Willard, chairman of the Federal Advisory Commission of the Council of National Defense. He stated that the committee had offered the services of the association, should they be needed in the national crisis, in whatever way it can be of assistance. Steps have been taken to ascertain the transportation problems which may have to be solved. Mr. Fisk read a letter which he had received from Mr. Willard in which appreciation for the attitude taken by the association was expressed and also the writer's desire for a conference with the committee. This meeting is still to be held. The association voted to extend the personnel of the committee to make it include the entire membership.

In the report presented by the public relations committee, which was read by Secretary William F. Stanton, Schenectady, the principle of fair treatment of the public was recommended and also courtesy in handling all complaints coming direct from individuals or through various representatives of the public. It was also urged that railways get in touch with the public for an exchange of ideas in order that facts may be learned by both.

For the committee on taxes and rates of fare, C. F. Hewitt, Albany, presented a progress report. He said that the problem before the committee was how the net income shall be increased. The committee does not believe that the time for asking for an increase of urban fares has yet come. Data are being compiled on the tax situation. The inequitable character of the paving tax is realized, and the question is as to the best means of securing relief.

In discussion of this report F. A. Stratton, Mount Vernon, introduced a resolution to the effect that a bill be introduced into the Legislature to eliminate that part of the law which requires electric roads to pave between tracks and 2 ft. on each side thereof, and this was referred to the executive committee for attention. Mr. Stratton pointed out that this exaction on surface railways was due to the former use of mules and horses, but that more recently franchise and other taxes have been added to the burden of the electric railway. There would probably now be no objection to the removal of this requirement which is really a tax, and it is important that an appropriate bill be introduced in the Legislature.


Ticket No. 4325
Fare Paid Between
Refund Value
Fare Collected
Miles Traveled
THIS RECEIPT IS WORTH MONEY—SAVE IT—Any Agent of this Company will redeem this receipt to amount shown in Red figures opposite punch mark indicating fare paid. Conductor
THE AUBURN & SYRACUSE ELECTRIC RAILROAD CO.
R W Palmer Gen Mgr
Jan
Feb
March
April
May
June
July
Aug
Sept
Oct
Nov
Dec
1
2
3
4
5
6
7
8
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Auburn
Car Barn
Prospect St
Stop 1
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11
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Roots Cor
Skaneateles
East Lake
Dando
Wiseman
Seymour
Williams
Otisco
Slate Hill
Marcellus
Sheehan
Marcel Falls
Marcellus Jct
Baker
Cammillus
Howlett Hill
Olney
Split Rock
Onondaga
Taunton
Chrysler
City Line
Syracuse
Half Fare
Dog Fare
1918
1917
2 8 3
2 10 4
3 13 5
3 15 6
4 18 7
4 20 8
5 23 9
5 25 10
6 28 11
6 30 12
7 33 13
7 35 14
8 38 15
8 40 16
9 43 17
9 45 18
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10 50 20
11 53 21
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13 65 26
14 68 27

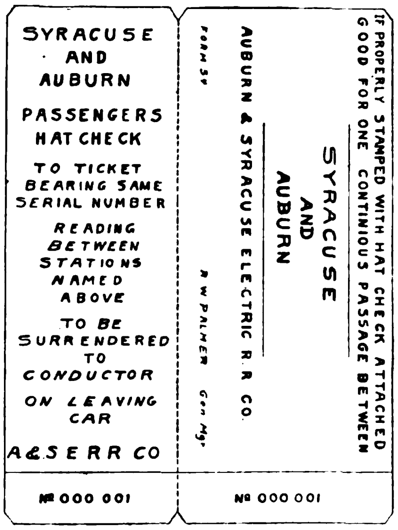
REDEEMABLE CASH FARE RECEIPT

PAPERS AND DISCUSSIONS

The first paper on the program was on "Indemnity and Surety Bonds," which was read by the author, William N. Tomlins, Jr., vice-president American Surety Company, New York City. This was abstracted last week. The only discussion of Mr. Tomlins' paper consisted in a reply by Mr. Tomlins to a question of W. J. Harvie, Syracuse, N. Y., as to the status of a surety contract when an employee changes the character of his occupation. Mr. Tomlins stated that an employee may change his occupation under a contract and that the present bonds do not cover the position occupied by the person bonded.

R. W. Palmer, general manager Auburn & Syracuse Electric Railroad, Auburn, N. Y., next read his paper on "Redeemable Cash-Fare Receipts," an abstract of which also appeared in last week's issue of the ELECTRIC RAILWAY JOURNAL. In presenting the paper, Mr. Palmer exhibited drawings of suggested receipts which are reproduced herewith.

The discussion on Mr. Palmer's paper centered largely in the practicability of charging excess fare on the cars. Mr. Stratton asked if there is any objection on the part of the Public Service Commission to the charging of an excess fare. To this, James McPhillips, Glens Falls, said that there is not. James E. Hewes, Rensselaer, stated that on his road there were many passengers who had refused to pay additional fare on the cars. There are always "conductor baiters" who like to utilize every occasion for oratory. The attempt by the conductors to collect an excess fare furnishes an opportunity for this purpose. Mr. Hewes considered the plan outlined by Mr. Palmer as an excellent one if it can be operated. On the Albany Southern Railroad the Ohmer system and tickets are used. The trouble with any very elaborate scheme is that too much time is required to carry it out. The giving of a small rebate to passengers who pay fares on the cars should be profitable in the reduction of "knocking down" fares which it will produce. Mr. Hewes and H. B. Weatherwax, Albany, debated briefly the subject of putting passengers off cars when they refuse to pay excess fare. The latter called attention to the fact that passengers can be put off at regular stops. With this Mr. Hewes agreed, but said that the legal department of his company had advised against doing so.


SYRACUSE
AND
AUBURN
PASSENGERS
HAT CHECK
TO TICKET
BEARING SAME
SERIAL NUMBER
READING
BETWEEN
STATIONS
NAMED
ABOVE
TO BE
SURRENDERED
TO
CONDUCTOR
ON LEAVING
CAR
A&S E R R CO
№ 000 001

IF PROPERLY STAMPED WITH HAT CHECK ATTACHED
GOOD FOR ONE CONTINIOUS PASSAGE BETWEEN
SYRACUSE
AND
AUBURN
AUBURN & SYRACUSE ELECTRIC R.R CO.
FORM 54
R W PALMER Gen Mgr
№ 000 001

REDEEMABLE RECEIPT AND HAT CHECK

Referring to the layout of the ticket proposed by Mr. Palmer, R. M. Colt, Gloversville, called attention to the opportunity for "short changing" which exists if only the mileage made by the passenger is indicated. The chances that a passenger would be able to check the accuracy of the punching are less under this scheme than if the stations also were identified on the ticket so that the correct refund could be at once determined. Mr. Palmer said that the mileage between stations could be shown on the back of the ticket or the conductor could be required to show the passenger such mileage on request. Mr. Colt thought that the New York State Commission, Second District, had rather implied that it is unfair to charge excess fare between non-agency stations. Mr. Palmer's scheme is an excellent one, he said, if its use is permissible.

In reply to a question by Mr. Hewes as to charging excess fare from a station which is closed after certain hours, Mr. Palmer stated that excess would not be charged in this case. After the discussion Mr. Palmer's paper was referred for consideration to the committee on taxation and rates of fare for report at the June meeting.

After the discussion on Mr. Palmer's paper R. L. Rand presented the paper on "Recent Tendencies in Taxation Matters," which was abstracted in last week's issue. A discussion then arose, participated in by Messrs. Hewitt, Stratton and McPhillips as to the relation of the law and franchise regulations regarding paving. The particular point was as to the effect of a State law on franchise stipulations. Mr. McPhillips explained that the railroad law provides for the maintenance of paving not only between tracks, but for 2 ft. outside. If a franchise contract specifies the requirements this constitutes a contract obligation, which would not be superseded by law. In some cases the franchise simply specifies that the law be complied with and in this case a change in the law would automatically change the contract. It is, however, a serious question as to what the effect of a change in the law would be on this matter.

H. A. Bullock, Brooklyn, favored something in the nature of Mr. Stratton's recommendation, and urged the use of educational propaganda with the object of securing ultimate relief. The newspapers and advertising spaces in the cars afford the best opportunities to reach the public.

Mr. Weatherwax raised the question as to the disposition of the Stratton resolution and hoped that the matter would be pushed, to which Mr. Barnes replied that the executive committee will consider it. Mr. Stratton hoped that the committee would push the matter vigorously, and Mr. Weatherwax expressed his belief that legislators are approachable on the subject. Mr. Hewes spoke a good word for the State Tax Commission, which he believed to be always ready to listen to fair complaints. It had made a careful study of his property and had adjusted the taxes equitably.

In conclusion H. W. Blake, ELECTRIC RAILWAY JOURNAL, called attention to a point in the paper by Mr. Rand which had not been touched on in the discussion, namely, that attention to the expenditure of taxes is as important as raising them. Taxes should be made reasonable, but at the same time the electric railways should interest themselves in economies in the use of public money.

GREETINGS FROM OTHER ASSOCIATIONS

E. P. Coleman, Hamilton, Ont., president of the Canadian Electric Railway Association, who was present by invitation of President Barnes, was called upon at the close of the discussion on taxation. He said that his association comprises twenty-seven member companies —nearly all of the electric railways in Canada. The difficulty of conducting association work in the Dominion is great because the members are spread out over such an enormous area, operating in seven provinces under the paternal control of the dominion government. The association, however, performs an important function in acting as a bond, drawing the different parts of the dominion together. The members take a lively interest in the activities of the association.

Mr. Coleman then talked in a patriotic strain, giving the members the point of view of an American citizen residing in a country at war. He said that there seemed to be an impression in the dominion that the people of the United States were somewhat indifferent and unsympathetic in the present crisis, but after listening to the report of Mr. Fisk's committee he realized that this impression is not correct. Mr. Coleman told of the heroic work being done by the Canadians not only in furnishing supplies for their own men at the front, but also in assisting the French.

Thomas A. Wright, Wilkes-Barre, Pa., president Pennsylvania Street Railway Association, also spoke at the morning session. In commenting on the discussion of the morning, he noted that the troubles of the railways everywhere are similar. In Pennsylvania, the State owns the streets, the supervision of which is delegated to the municipalities. The assent of the municipalities is needed to permit railways to operate and this assent may include paving specifications. He questioned the wisdom of trying to secure relief from the paving burden, as a matter of policy. There are cases where injustices occur in connection with paving and he mentioned an aggravated case which is to be tried out before the courts. A city started to install a sewer in a street which had been recently paved, requiring the repaving of the street. In this case a different type of paving from that originally used was selected. The railway was asked to pay its share of the expense. It is now contesting the claim, and the outcome will be not only interesting but important.

Mr. Wright believed in the educational campaign idea for securing relief from burdens and directed attention to the method used by the telephone companies. These have formerly used a great deal of newspaper space, but of late have been utilizing moving pictures, lantern slides, etc., in schools and elsewhere. They are thus laying the foundation for future public sentiment.

Afternoon Session

Before taking up the regular afternoon program President Barnes introduced Mr. Wright, who gave a very interesting narrative in regard to the recent fourteen-month strike on the Wilkes-Barre (Pa.) Railway. The course of this strike was fully described in the ELECTRIC RAILWAY JOURNAL during this period, and its entire history was summarized in the issue of Dec. 23, 1916, page 1312. Mr. Wright stated that the events in Wilkes-Barre had educated the people in regard to the value of local transportation service and also had showed the populace the instability and unsatisfactory character of jitney service. Even in such a union district as that inhabited by anthracite coal miners, there had been an entire change of sentiment on the part of merchants and the general public in favor of fair treatment to the railway, and although the strike had been costly to the management the results were well worth it.

Vice-President Hewitt, who had taken the chair during Mr. Wright's story, expressed the appreciation of the association for the light thrown upon the activities of union labor in Wilkes-Barre. He then took up the program of the meeting, which called first for a discussion of the methods of discipline in various departments of electric railway operation.

METHODS OF DISCIPLINE

The first speaker was B. Penoyer, Schenectady, who mentioned briefly a few points in connection with the discipline of employees in the way and structures department. After explaining how track department foremen are instructed in regard to transportation department rules, the handling of tools, the use of inflammable materials and the like, he stated that the discipline of minor offenses is handled by the roadmaster and others by the engineer-of-way, a similar procedure being followed in the case of the linemen.

In discussing discipline in the mechanical department, D. E. Crouse, Auburn, said that discipline is dependent upon the employee's frame of mind, and this can best be effected by attention to three factors, namely, equity, ambition and efficiency. Equity, which should be substituted for profanity, should be an effort on the part of the department head to keep in human touch with his men and give and take in his decisions with absolute fairness as a basis. When a workman has committed a fault, he expects to be censured and does not respect his foreman if the opportunity is neglected. On the other hand, if a good man is punished for some action for which he is not to blame, he may be converted by this injustice into an inefficient man. In mentioning ambition as a component part of discipline, Mr. Crouse referred to its educational value. In his opinion, the man who is interested in the job ahead of him will not have so much time to idle away. In many cases shop men will not voluntarily ask their foremen for blueprints, airbrake instruction books, etc., but they will study these industriously when placed in their hands by the company. The nearer a company approaches the principles of a manual training school in its shop, the more it can control discipline and efficiency. The ambition of the foreman, however, should not be forgotten, for he needs something to which he can look ahead. The master mechanic must be careful to give orders to the foreman and not directly to the men, for the position of the foreman should be respected from above as well as below. As for the third point of efficiency, this has a marked bearing on discipline. If modern tools are used; if car-pits are well arranged and sanitary; if materials are purchased of up-to-date makers and placed within easy reach; if armature rack, wheel track, etc., are close to the place for truck repairs—it is logical to assume that the smooth-running shop will house more contented and hence better disciplined men. Men often work themselves into a disgruntled state because they are forced to do work in such an inefficient manner that their intelligence is insulted.

W. J. Harvie, Syracuse, N. Y., in taking up the power department, said that the more opportunity a man has for advancement through efficiency the less will be the need of discipline. When men are not treated as a group in which individuality is to some extent lost to view, discipline is a matter more of education than of censure. The next speaker was Mr. Bullock, who read a paper outlining the general principles of discipline that should be followed in a transportation department, and describing their application as practised by the Brooklyn Rapid Transit System. This is published in abstract form elsewhere.

The discussion was closed by W. W. Foster, Rochester, with a statement regarding the methods of discipline in the office. Mr. Foster felt that the foundation of good office discipline is a good organization. The positions in an office should be so graded that the advancement can be continuous from office boy to chief clerk. Each clerk should be so drilled that he can hold down the position he is in, instruct the clerk below him with one hand and reach for the position ahead of him with the other. Vacations afford an opportunity for an employee to demonstrate his fitness for advancement when the opportunity is offered. Automatic advancement all along the line when a vacancy occurs under this plan produces minimum disturbance and maximum advancement.

The discipline in such an organization, Mr. Foster said, cannot be carried on by any definite set rules, but depends upon the material in the organization itself and is largely a matter of personality. Some clerks can be led to advancement, and others have to be driven. In the former case, the office manager has usually an exceptional opportunity to lend a helping hand, make suggestions and criticisms, and in general shape the personality of the men. In case a clerk must be driven, the methods generally used in other departments will not ordinarily work well. Between the reprimand and absolute discharge, there is no middle ground which does not penalize the fellow clerk more severely than the clerk disciplined. In conclusion Mr. Foster said that true office discipline is written in terms of co-operation. The office disciplinarian resorts to discharge only when the material which he is attempting to form proves itself unfit or inefficient.

The Banquet

The meeting closed with an unusually successful banquet, to which about 300 men sat down. Mr. Barnes acted as toastmaster, introducing first Public Service Commissioner James O. Carr of the Second District, New York. Mr. Carr said that the railway men before him had never in their lifetimes had a bigger problem than to educate the public that the time might come when it would be necessary to pay more than a 5-cent fare. This increase in fare, he said, would come from the public which the railways serve, and, he believed, it was the railways' duty to enlighten the public so that it will ask, "Are the railways entitled to this increase?"

instead of opposing it from the start without looking into the merits of the case. He said there was no better example than the condition of affairs in this great city, where it was beyond the bounds of reason to expect that the railways will always be able to give the length of rides they do for as small a return as a nickel.

In meeting the problem of educating the public, Mr. Carr thought that the railways would find the commission a blessing and not a curse. The commission's functions are to aid the railways in their work as well as to serve the public, and there are many more things they could do if they had the authority. When the laws are amended to give them this power, the railways' troubles at the hands of regulatory bodies will no doubt be lessened.

Commissioner T. S. Whitney of the First District Commission of New York was the next speaker. He referred to this commission as not only a regulatory body, but a construction department as well, calling attention to its work in the enormous construction plans being carried out on lines in New York City, to care for the increased traffic. The speaker said that after observing the results of the work of public service commissions he had noted a changed attitude. It is now less necessary to make formal specifications for railways, for they are willing to deal liberally with the public. In conclusion, he congratulated the association on its helpful services in effecting the better conditions.

The last speaker of the evening was A. G. Empey, first machine gunner and bomber of H. M. Imperial British Expeditionary Force in France, who vividly told of his experiences in England and France. He enlisted in London for the term of the war but was wounded on three different occasions and was finally discharged on account of disability after serving nearly two years. He was formerly a sergeant-major in the United States army, having served six years as a regular and two years in the militia.

Discipline in the Transportation Department*

The Principles Which Should Underlie This Discipline as a Foundation for Effective Methods of Administration

By H. A. BULLOCK
Secretary New York Municipal Railway Corporation, Brooklyn, N. Y.

THE following statements deal with the principles which should, I believe, underlie transportation department discipline, rather than methods by which such discipline should be made effective. This phase of the subject has been selected for two reasons. First, if the principles are correct, the methods are not difficult to determine, and such methods must vary somewhat according to conditions on any given railroad property and in any given branch of railroad operation. In our own system, while the principles are uniform, the methods and details differ somewhat as between the two branches of the transportation department, the surface lines and the rapid-transit lines. Similar differences would doubtless be justified in particular methods as between any two street railroad properties.

In the second place, I speak from observation and analysis rather than from practical experience in the building of any system of discipline. I have had certain experience in matters affecting the relations of our operating employees with the management of the company and have had occasion to study these relations in other street railroad systems. It is on the basis of this experience that I shall treat the subject in hand.

It is a mistake to hold that discipline begins only when an employee has been in an organization long enough to commit some violation deserving punishment. The foundation of discipline should be laid in the employment bureau. Selection of men wherever possible with regard for their physical and mental capability for the work for which they are intended is essential. This is said with an entire realization of the employment difficulties at such times as those through which we have recently been passing. But there is no excuse for not making the beginning of discipline by proper physical and mental inspection at the time of employment and the creation of records accordingly.

Similarly proper instruction is essential to successful discipline. An employee who does not know how, cannot be expected either to accept the disciplinary requirements intelligently, or to profit by correction or punishment, should that be necessary. Instruction must not be restricted to the brief period preceding entrance into service. It must continue for some time after the employee is in service and must be repeated periodically so long as his service continues, and particularly when any violation has been committed indicating a defect of understanding or of memory.

Methods may vary, for one road may be able to afford an elaborate schoolroom while another is obliged to give most of its instruction on the cars. One road may conduct the re-instruction of its employees in service through periodical examination of all of them; whereas another road may find it more satisfactory to select the employees requiring such re-instruction from time to time by means of the violation reports rendered by its inspectors and received through its accident and other records. The principle, however, is the same. When instruction and discipline are linked together, both become part of a process of building up an efficient organization through making its constituent members individually efficient.

Right here, in my judgment, is the heart of the entire matter. Discipline is necessary in a railroad company because a great many different people are required to work together to produce a certain result under very rigidly prescribed conditions. These people represent a very large number of distinct employments. Their union is effected through the railroad organization. The purpose is to supply a commodity—transportation—to the community. The prescribed conditions involve the necessity of operating under schedules in public streets, with frequent stops, at a low uniform fare, and under the most rigid public regulation. The only way in which an equation connecting these quantities can be worked out is through the maintenance of discipline, for if everyone attempted to do his work in his own way and at his own time (even if everyone knew a correct way) the result would be hopeless confusion.

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*Abstract of a paper read at the Quarterly Meeting of the New York Electric Railway Association, New York, March 2, 1917.

All discipline has to be cheerfully accepted by those to whom it is applied in order that it may be successful. We recognize this in speaking of the morale of an army. In the case of a street railroad, where the organization is split up into many detached units and men are sent out two by two to operate cars all over a large territory, the need for the willing acceptance of discipline by the employees is greater than in any other organization of which I can think, except possibly an army operating under modern conditions of field service. Obviously, any discipline which means only punishment must be hateful. So discipline must be coupled with instruction, and this instruction should extend not only to a knowledge of the details of the particular work to be done by the individual, but should embrace a general knowledge of the purposes of the organization at least sufficient to enable an employee to understand why discipline itself is necessary for successful operation.

For successful instruction a proper code or set of operating rules is the first requisite. This code we may divide generally into three parts.

First: The rules governing the operation of cars.

Second: The rules governing the relation of individuals in the organization in respect to the issuance and execution of orders and the method of dealing with violations.

Third: The disciplinary procedure affecting the individual violator, embracing such matters as notice of offense, opportunity for hearing, right of appeal and degree of punishment.

If discipline and instruction are to go hand in hand all of this code must be available for the information of employees, and while it may not be practical to insist upon personal instruction on all the regulations contained, still the spirit which produces the willing acceptance of a discipline founded upon belief in its fairness, requires that every man in the organization shall have opportunity to study its entire structure so far as it concerns or may concern himself.

THREE SUB-DIVISIONS OF THE CODE

The rules governing the operation of cars must be determined for each railroad according to its own conditions. They should be issued in printed form and in convenient size to be carried in a coat pocket, so that an employee may be encouraged to study the operating rules whenever opportunity offers and may always have them at hand in order to determine the correct procedure in any perplexing situation. The issuance of such rules is now a general practice.

The rules governing the relation of individuals in the organization with respect to the issuance and execution of orders and the method of dealing with violations are next in order. One essential of successful discipline is that all should know from whom orders are to be expected and to whom orders are to be given. There is no reason why the substance of the information presented by an organization chart cannot be incorporated in any book of rules and why such a chart itself cannot be used in instruction rooms and other educational work. It is difficult to maintain a proper sense of individual responsibility unless the individual realizes his relationship to the rest of the organization. Take the matter of accident reports, for example. A car crew, feeling that accident reports serve mainly as a basis for administering punishment, will naturally avoid making such reports if possible. If the crew can be made to realize, however, that the reports are the primary means by which the company protects itself from unjust claims, and are also used in important accident prevention studies, the foundation for a different attitude toward the reports is laid.

It is important, moreover, that intermediate officials should not get the habit of giving orders and applying criticism to men who are not responsible to them in the matters which may be made the basis for such orders or criticism. The only really successful discipline is impartial discipline, and that sort of discipline demands that orders must be issued and corrective measures administered by those whose duty it is to do these things. Supervisory officials who are required to inspect and report must understand that their work cannot be successful and their reports cannot be taken at their face value if they attempt to exercise personal authority over the men whom they are instructed only to observe and report upon.

On the subject of disciplinary procedure affecting the individual violator, and embracing such matters as notice of violations, opportunity for hearing, right of appeal and degree of punishment, the principles are easily stated. There should, of course, be proper notice, opportunity for hearing, just and uniform procedure in the administration of punishment and the right of appeal. On the possible methods by which these principles may be made effective, a long treatise might be prepared. Some of the methods employed on the Brooklyn Rapid Transit System will be given, not to imply that these are the only proper methods, but as methods which are consistent with the principles already laid down. On this system there are used the following:

First: A uniform penalty code in which violations are classified with sufficient detail to cover practically every type of operating offense. In this code all offenses are classified under four headings.

A. Admonition offenses, carrying no demerits on the first offense, but carrying a prescribed number of demerits on later offenses.

B. Demerit offenses, carrying a prescribed number of demerits for each offense.

C. "L" offenses (an arbitrary symbol), carrying demerits to the number recommended by division superintendent if and when approved by the superintendent of transportation, and

D. "D" offenses, rendering employees at once liable to discharge, but only by action of the superintendent of transportation.

The most important two effects of this code are that it eliminates suspension as a punishment, and that it minimizes the chance for discrimination by intermediate officials by prescribing uniform penalties for minor offenses, and on all offenses of major importance requiring the decision of the superintendent of transportation.

Second: A personal record card, on which the records of employees disciplined are recorded with the same detail as in the code itself, and a system of credits (which may be either for service or for freedom from demerits over a given period) but which shall in any event be sufficient to offset the demerits obtained by the average good man and shall enable a man by exceptional performance to accumulate a balance of credits. On this basis it is possible to provide that when a certain net balance of demerits shall have been accumulated an employee automatically goes out of service never to be re-employed. This does not restrict opportunities for summary punishment when that is required. Under an "L" or a "D" offense, sufficient demerits may, with the approval of the superintendent of transportation, be at any time imposed to put the offender out of service. The code provides also an automatic means of eliminating the habitual petty violator, who, if he remains long enough in service, will develop a disregard for all discipline which ultimately will produce some monstrous violation—possibly resulting in a very serious accident.

Third: With respect to all admonition or demerit offenses, a notice form should be used which not only conveys to the employee a clear idea of what he has done, but requires him to either accept his punishment by signing an acknowledgment thereof, or to appeal to higher authority. It may be thought that the right of such appeal would produce a great number of petty discussions between transportation superintendents and offending employees. In practice it seems not to do so, and if at a given time there may be what the electricians would call a "surge" of minor appeals, still the reasonable settlement of all such cases means a contented force and a belief in the fairness of the disciplinary system. With respect to the "L" or "D" offenses above mentioned, the procedure in the first instance requires the decision of the superintendent of transportation.

The question of any further appeal involves other considerations, which are in a sense outside of this discussion. In general we must agree that the door to the president's office should be open to any aggrieved employee, and certainly a general manager in charge of operation should consider the righting of any possible cases of injustice one of his most important duties. In our own organization, not being unionized, we have departmental trustees, elected by the men to take up all complaint cases first with the head of the department involved and ultimately, if necessary, with the president. On some properties where labor unions exist this function doubtless has to be left to the representatives of the union.

I do not, however, believe that it is consistent with sound discipline to leave the decision in any such case, or in any other matter between wage-earning employees and street railroad managers, to a body outside of the organization of the railroad itself. The management of the railroad is responsible for the investment in the property, and for the service which is rendered to the public. The maintenance of unbroken service, the maintenance of safety and of efficient operation depends upon successful discipline as much as upon any other single element. I am unable to see how the management of a railroad could justify itself to the stockholders or to the public if it voluntarily surrendered to any outside body the ultimate decision in these matters. I cannot persuade myself that the effect upon discipline of such surrender by the management can be anything but detrimental, for the surrender in itself may be construed as a confession that the management is not confident of its ability to have its discipline accepted by the employees as fair and just and a necessary condition of the employment they have entered. Any such confession seems to me not to provide a basis for mutual respect and confidence between management and employee. And I am wholly unable to see how any of these difficulties could be cured merely by the enactment of a law taking from the management of electric railroads responsibilities which the management would not itself be justified in surrendering.

Fourth: It will greatly strengthen the union between discipline and instruction if the form used in notifying offenders of violations is so phrased as to call their attention to the nature and consequences of the violations in a friendly and helpful way, even though discipline may be at once required. This is particularly true in violations involving discourtesy, disregard of the safety of passengers, etc.

The work of the instruction branch in the re-instruction of employees should be tied in with the disciplinary system at this point. Whether the re-instruction work is based upon a periodical examination or upon reports of violations is a matter of detail. The important thing is that the man who receives discipline should be made to understand at the same time that his superiors are making every effort so to reinforce his memory, his judgment or his knowledge of the matters in which he has offended, that he will not be likely to commit the same offense again.

Of course, there should be a warning when a man begins to pile up a bad record, and the use of a personal record card enables the individual in charge of this work to point out the particular offenses which have brought the trainman into the "danger zone." If possible this warning should be given by some one directly associated with the superintendent of transportation so that the employee may feel that the head of his department is interested in keeping him personally in service.

Fifth: There should be a period of probation between the close of the instruction period and the commencement of permanent service. The street railroad business is one of the most intricate in the world. The average motorman or conductor comes to his job with no previous knowledge of it. His period of instruction is necessarily brief, considering the responsibility that is placed on him when he takes out his car. It is only fair, therefore, that there should be a period of probation and such period enables the management to watch a man's work for a while and then to decide, upon all the evidence, whether he is desirable for admission to actual service. In our own system the probational period is three months. A personal record is kept just as in the case of permanent employees, but if the man is admitted to regular service, his slate is then wiped clean and he starts over again.

I have attempted in the foregoing to lay down certain simple principles upon which I think all may agree as a sound basis for street railroad discipline, and to illustrate the operation of these principles by some of the experience which I have had opportunity to observe. In leaving the subject we must not forget that the object of faithful service is promotion, and that the establishment of seniority in all grades where many men are employed, and the recognition of such seniority, and of personal efficiency records in promotion, not only tends to promote the best men, but is a guarantee to all that faithful service will not be overlooked. We may mention also the importance of protecting seniority as a basis for advancing rates of pay. Here again an extended discussion might be developed, which must be waived at this time because of the limitations of our subject.

I hope that the conception which I have given of a system of discipline is fair enough and wise enough to serve as a basis for mutual confidence between street railway wage workers and the managements of street railway companies. I can think of no more vital basis for the development of such confidence, and without it we can hardly expect to secure that united and determined effort of both managers and wage earners through which alone street railway companies seem able to meet the many and varied problems which are at the present time confronting them.

Two-wheel automobile trailers which carry all materials required for making line repairs are being used by the San Diego Consolidated Gas & Electric Company so that any line difficulty may be attended to without the delay usually caused by waiting for an available construction truck. One of these trailers is always kept at the store yard fully loaded and ready for instant use. Each is equipped with pneumatic-tire wheels and a coupling by which the drawbar may be attached to any one of the company's thirty-five automobiles.

Chicago Traction for 5,000,000 in 1950

Traction and Subway Commission Issues Supplemental Report Containing Estimate of Future City Growth—Its Possible Effects Upon Transportation Earnings and Needs Are Studied

IN order to form a basis for estimating the gross earnings of the consolidated traction system in Chicago in the future, and also the number of passengers which the system will be expected to serve, the Chicago (Ill.) Traction and Subway Commission has made an elaborate study of the characteristics, growth and development of the city insofar as these have a direct bearing on its transportation problems. This study forms Chap. 1 of the supplement to the commission's report, the main section of which was abstracted in the ELECTRIC RAILWAY JOURNAL for Dec. 9 and Dec. 23, 1916. In the present addition the commissioners reach the general conclusion that it is reasonably safe to assume that Chicago's growth will continue at a rate which will produce a population of not less than 5,000,000 persons by about 1950, or about double the present population.

GROWTH AND DENSITY OF POPULATION

Since its incorporation as a town in 1834 with a population of about 300, Chicago has grown steadily and at times very rapidly until, in 1916, the school census indicated a population of more than 2,500,000, distributed quite unevenly over the city.

The manner in which this present population of Chicago is distributed over the city area, which has a material bearing on the financial possibility of any transportation plan, is illustrated in a density contour map shown opposite. The most densely settled districts, as the commission points out, are located between the north and south branches of the Chicago River and Western Avenue. Within this area the population reaches a maximum density of 160,000 persons per square mile (250 per acre) for a few city blocks. About half of this area shows a density of 100,000 or more per square mile (156 per acre). Only two other small sections of the city are as densely populated as this one, one located adjacent to the stock yards and the other north of the loop district between Wells Street and Halsted Street and Chicago Avenue and North Avenue.

These heavily populated districts, however, are not so dense as those in some other cities, notably the East Side of New York, which has 410,000 persons per square mile (640 per acre) with certain blocks reaching a maximum of more than 1000 per acre. The average number of persons per square mile in Chicago is 12,787 (twenty per acre), while that for New York (Manhattan Island) is 105,000 per square mile (164 per acre), or more than eight times as great. A comparison of ten of the largest American cities for the year 1910 indicates ,that while Chicago is second in population it is seventh in density.

OUTWARD RESIDENTIAL MOVEMENT

The level nature of the topography of the city and the ease with which sections can be opened up for building purposes, together with certain provisions in the building laws which practically limit the economic height of apartment buildings, have led to a distribution of the residential population over very wide areas. The construction of surface and elevated lines, which have constantly reached out into new territory, has also stimulated the outward movement of population.

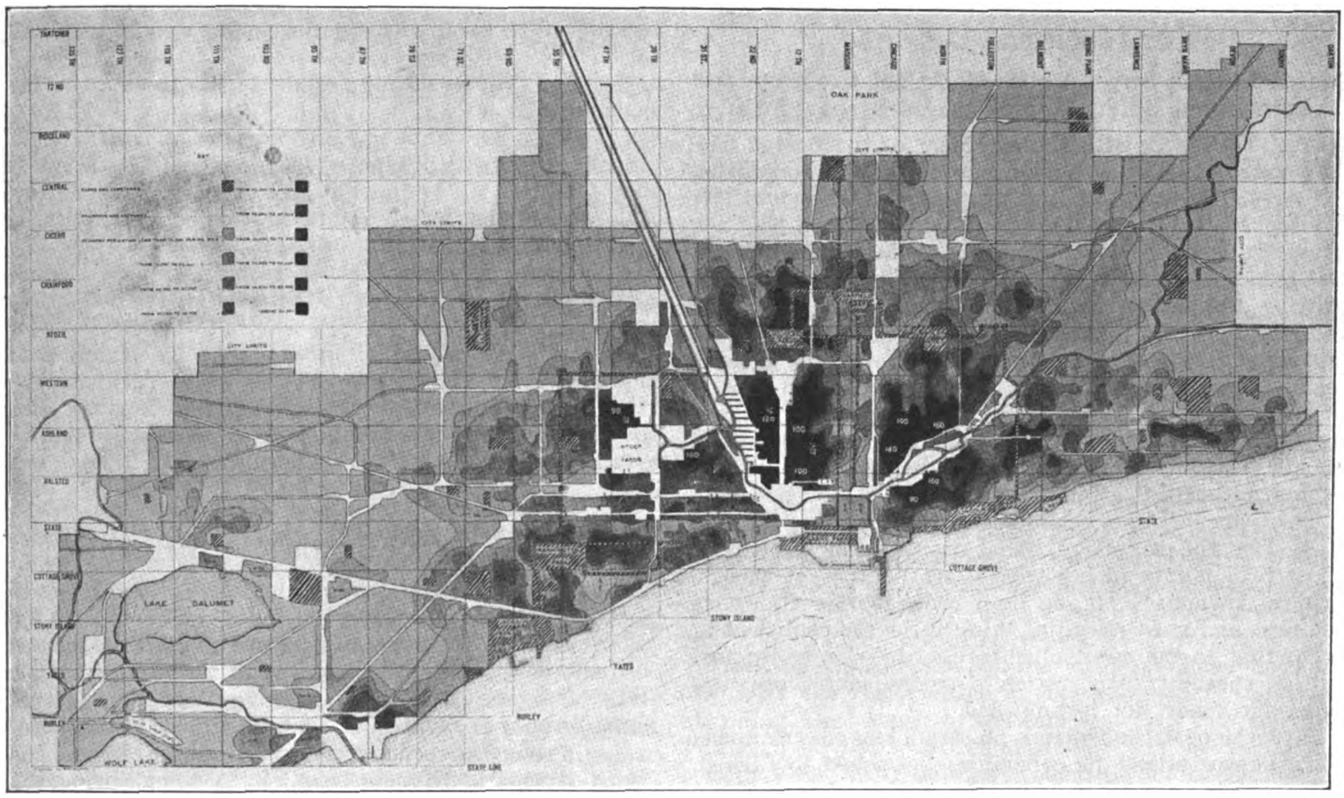
The rapidly growing sections of the north and northwest seem to have followed the development of rapid transit into those districts; as, for instance, those along the Northwestern Elevated north of Lawrence Avenue and in Ravenswood, some of which have increased tenfold since the 1900 census. On the south side, the Hyde Park, Woodlawn and Englewood districts have also shown a remarkable increase since 1900. On the west side the increase in the sections along the rapid transit lines is also apparent. An important fact in this connection is that since 1900 the inlying district bounded by Twenty-second Street, Halsted Street and Chicago Avenue has recorded a decrease.

The center of population for Chicago in 1900 was located at Racine Avenue and Eighteenth Street. Since then it has moved gradually westward until in 1916 it was located at Ashland Avenue and Sixteenth Street, about one-half mile northwest from the 1900 point. For 1860, 1870 and 1880 the greatest number of persons lived between 1 and 2 miles from the center of the city, taken to be the corner of State Street and Madison Street. In 1890 the maximum number shifted 1 mile outward, where it remained until 1910. The 1916 school census indicates that there has been a further expansion outward of 2 miles, placing the maximum of 421,000 persons between 4 and 5 miles from the center. Thus, in the last six years the maximum number of persons residing in a zone 1 mile wide has moved outward 2 miles, with a consequent increase in population in all zones beyond this maximum zone.

According to the commission, the low average density of twenty persons per acre for the whole city area is largely due to the wide distribution of its principal residential districts, the lack of uniform building in these districts and the large areas still undeveloped. The separation of the residential population into many districts and the relatively low average density of the areas tributary to practicable transit routes, promise a volume of traffic sufficient to support certain high-speed elevated lines at the present time, but insufficient to support corresponding subways with their much greater cost until development has proceeded further.

ESTIMATING THE FUTURE RIDING HABIT AND EARNINGS

With the increase in population estimated through the year 1950, the commission attempts to derive from this the number of total revenue rides which may be expected. Any increase in traction gross receipts depends upon either a growth in population or an increase in rides per capita, or both. No hard and fast rule, it is said, can be deduced from the experience of one city when growing from 1,000,000 to 1,500,000, for instance, that can be applied to another city when growing between the same limits, if, as is usually the case, this increase in growth occurs at widely separated periods and under different traction and economic conditions. From a comparison of the traction receipts and population increases of Chicago during the last twenty-five years, however, with those of other large cities during the same periods, the general limits within which probable future earnings may be estimated can be seen.



CONTOUR DENSITY MAP SHOWING DISTRIBUTION OF CHICAGO'S 1916 POPULATION

Table I shows the population, passenger revenue per capita and the rides per capita per annum for the twenty-six-year period from 1890 to 1916 inclusive, including all surface and elevated lines for the entire city. The figures for 1917 and 1950 are those adopted by the commissioners as the basis for their financial plan.

TABLE I—TOTAL REVENUE RIDES PER CAPITA FOR CHICAGO SURFACE, ELEVATED AND SUBWAY LINES

Year	Population	Annual Passenger Revenue Per Capita	Annual Revenue Rides Per Capita	Annual Increase in Revenue Rides Per Capita
1890	1,099,850†	$8.20	164	4.8
1895	1,399,215‡	9.42	188	5.4
1900	1,698,575†	10.74	215	7.6
1905	1,941,929‡	12.66	253	13.4
1910	2,185,283†	15.98	320	...
1916	2,544,249*	17.05	341	...
1917	2,539,559	16.70	334	...
1950	5,000,000	$20.00	400	2.0

†United States census enumeration.
‡Interpolated on basis of yearly uniform increase.
*School census estimate.

In the financial plan presented in another part of the commission's report, which will be abstracted in these columns later on, the number of revenue rides per capita was arbitrarily assumed to increase at the rate of two rides per annum, that is, from 334 in 1917 to 400 in 1950. The latter figure, together with the estimated population of 5,000,000 for the same date, results in a passenger revenue of $100,000,000 and gross receipts of $104,500,000, including such additional income as other revenue from transportation, revenue from other railway operations, non-operating income and profit and loss credits. The gross receipts and increases by decades as estimated for the period are shown in Table II.

ESTIMATES ARE CONSERVATIVE

In concluding this chapter, the commission calls attention to the fact that its conservatism is evident from the column of average annual increases when compared with past years' growth. Thus, for two decades of extraordinary growth, the combined surface and elevated system showed an average increase of nearly 10 per cent per year. Similarly, the entire surface and elevated system of Greater New York, which now earns approximately $100,000,000 per year (about the same as the estimate for Chicago in 1950), maintained a compound rate of increase of 5 per cent per year from 1906 to 1914. Yet the commissioners' estimate for Chicago for the last decade, 1940 to 1950, results in a rate of only 2.3 per cent per year.

TABLE II—GROSS RECEIPTS—SURFACE, ELEVATED AND SUBWAY

Year, Actual	Gross Receipts	Increase	Average Per Cent Increase Per Annum
1890	$9,200,000	....	...
1900	18,636,324	$9,436,324	10.3
1910	35,629,912	16,993,588	9.1
1916	*44,372,764	8,742,852 (6 years)	4.1
Estimated:			
1917	44,010,635	....	...
1920	48,979,995	13,350,083	3.8
1930	66,286,814	17,306,819	3.5
1940	84,658,809	18,371,995	2.8
1950	104,500,000	19,841,191	2.3

*Includes miscellaneous earnings estimated at $1,000,000.

This conservatism in predicting future growth in Chicago, it is stated, is believed to be justified on account of the comparative absence of large population centers outside of the city limits, whereas New York City's transportation system daily serves a large suburban population and, in addition, a transient or floating population variously estimated at from 200,000 to 500,000 persons. The commission feels, therefore, that the basic estimate of revenue may be regarded as reasonable, and that any construction program depending for its support on gross receipts as conservative as $104,000,000 by 1950 may be expected to prove financially sound.

The Public Service Commission for the Second District of New York has just issued Volume II of its ninth annual report, for the year ended Dec. 31, 1915. This contains organization, financial, operating and miscellaneous figures for the operating and lessor electric railways under the jurisdiction of the commission for the fiscal year ended June 30, 1915.

For National Defense

Massachusetts Street Railways Asked to Co-operate with Public Safety Committee on Preparedness

MATTHEW C. BRUSH, president of the Boston Elevated Railway and chairman of the sub-committee of street railways of the transportation committee, Massachusetts Committee on Public Safety, has addressed a letter bearing upon preparedness issues to all the principal electric railways of the state. In transmitting the letter, which is designed to further the compilation of data and suggestions relative to defense and co-operation of the roads addressed with the government in case of hostilities, Mr. Brush outlines the scope of the committee's work as recently mentioned in this paper, and requests the information outlined below as an aid to the committee, to be placed on file with the proper authorities after its reception.

The transportation committee has agreed:

A. That the protection, under proper public authority, of critical points like powerhouses, sources of power, bridges, carhouses, etc., in their order of importance, is the first and most essential thing to be accomplished in order that in the event of outbreaks by riot or by hostilities, speedy transportation of troops, munitions, supplies, etc., may not be impeded.

B. As to possible demands on steam and electric roads for transportation, the companies are asked to furnish the executive committee with the names of the officers of all steam and electric roads to whom applications should be made for such transportation. The steam roads have furnished such information, and the electric railways are requested immediately to prepare it.

The following additional data are requested:

1. Indicate the manner in which and the extent to which power stations and power lines should be protected or intercommunication arrangements made for assistance by various power sources in case of local failure. This list should also indicate for each station the kilowatt capacity, together with the coal storage facilities and should also show what steps might be necessary to secure an adequate coal supply.

2. The sub-committee is offering to the transportation committee the experience in cities where unusual demands have been placed on electric railway transportation, because an abnormal increase in manufacturing activities has shown that arbitrary action must be taken to meet the unusual situation in carrying on regular business as well as transporting such additional business. Companies are asked to indicate in what respect this matter should be regulated and how it is to be accomplished on individual properties.

3. Supply maps showing all electric lines controlled or operated by each company with their relation to armories, manufacturing industries, existing connections with steam railroads, docks, electric railways, power houses, spur tracks, etc.

4. Supply maps to show possible or emergency connections between electric railways controlled or operated by individual companies and the steam roads, as well as electric railway connections with manufacturing and industrial plants, all to facilitate the movement of troops or material. This map should also show portions of each company's lines over which steam railroad equipment could be handled.

5. Supply lists of all rolling stock on each road, passenger, freight, service, coal, work cars, etc., giving for each type overall dimensions, length, width and height, distance center to center of trucks, type of couplers, gross weight, etc. Lists are also desired of limiting clearance points on each system and for what clearance they are determined and lists of bridges exceeding 10-ft. span with the maximum weight they will carry.

6. Supply copies of any freight tariffs in effect on the system.

7. Supply lists showing any surplus above the individual company's anticipated needs, of power station or shop facilities, as well as any like surplus of machinery, tools or supplies which might be immediately released for government uses.

8. Indicate in what further respect, if any, electric railways can be of service in the work of the committee on public safety.

Replies were requested in duplicate by March 8 to inquiries A, 1 and 2, the balance to be furnished by March 15. Companies were requested to forward such data as are ready on the dates mentioned, accompanied by an explanation of when delayed answers, if any, will follow.

Illinois Association Committees

President C. F. Handshy of the Illinois Electric Railway Association has made the following committee appointments for the current year of the association:

Membership committee—Frank E. Johnson, the Ohio Brass Company, Chicago, chairman, and Marshall E. Sampsell and G. T. Seely.

Engineering committee, electrical—John Leisenring, signal engineer, Illinois Traction System, Springfield, Ill., chairman, and Charles H. Jones, G. W. Welsh and E. S. Gillette.

Engineering committee, mechanical—H. A. Johnson, master mechanic, Chicago Elevated Railway, chairman, and J. M. Bosenbury, John Sutherland and J. N. Graham.

Engineering committee, way—B. J. Fallon, engineer maintenance of way, Chicago Elevated Railway, chairman, and John B. Tinnon, C. J. Jones and W. F. Carr.

Traffic committee—R. Breckenridge, traffic agent, Aurora, Elgin & Chicago Railroad, chairman, and W. P. Potter, O. C. Shockley, F. W. Shappert and C. S. Darrach

Safety committee—Henry B. Adams, safety supervisor, Aurora, Elgin & Chicago Railroad, chairman, and W. H. Heun, Joseph O'Hara, W. J. Fillmore and J. H. Mallon.

Publicity committee—E. E. Soules, manager publicity, Illinois Traction System, Peoria, Ill., chairman, and J. M. Strasser, H. E. Weeks, F. C. Eckmann, R. H. Hayward, and W. W. Crawford.

Program committee—L. E. Gould, ELECTRIC RAILWAY JOURNAL, Chicago, chairman, and H. J. Kenfield, J. W. Busch, A. P. Jenks, F. E. Fisher, and W. V. Griffin.

The next meeting of the Illinois Association will be held March 23, at Chicago.

American Electric Cars in Barcelona

The electric railway running from Barcelona, Spain, to Sarria, a distance of nearly three miles, has recently been extended as far as Las Planas, about 3½ miles farther, according to the *Bureau of Commerce Reports*. The new section starts from the station of Sarria, passes through a tunnel 653 ft. in length, follows the mountain stream Pomaret, the course of which has been partially diverted, passes through a second tunnel 1194 ft. long, and farther on through a third tunnel 564 ft.

The rolling stock for the line comprises electric motor cars and trailers. The cars were built in America and are provided with four motors of 125 hp. The passenger cars are closed and are 56 ft. long, designed for single and double-end operation.

C. E. R. A. Holds Annual Meeting

First Day of Indianapolis Convention Evidenced Community of Interest and Worth of Co-operation—Good Spirit Prevailed and Encouraging Aspects of the Business Were Emphasized—Past-Presidents Talked on History of Association

AN unusual spirit of optimism and lighthearted fellowship prevailed at the first day's session of the Central Electric Railway Association's annual meeting at the Claypool Hotel, Indianapolis, on March 8.

C. N. Wilcoxon, first vice-president, presided over the morning and afternoon sessions in the absence of President A. Benham, who was detained in Springfield because of urgent company matters. The latter's annual address was read by Mr. Wilcoxon and appears elsewhere in part. The meetings were well attended.

The conviction was evident that the association had come to a more definite state of accomplishment than ever before. The results of the eleven years of co-operation of the member companies in the association work, as reviewed by several of the past-presidents, seemed to give ample reason for congratulation over the difficulties overcome and the splendid progress made in the industry.

The gloom which has been in evidence at so many electric railway meetings was missing, and in its place was a decided air of anticipation of better days ahead. Five of the nine past-presidents of the association were present and addressed the meeting, relating some of the trials and struggles in the early existence of the association and reviewing the accomplishments and pleasantries of their terms of office. The past-presidents who spoke included H. A. Nicholl, Anderson, Ind.; George Whysall, Marion, Ohio, and E. B. Peck and C. L. Henry, Indianapolis, Ind. A. W. Brady, Anderson, Ind., was also present and was scheduled to address the meeting at the Friday session. A short address from E. C. Spring, Allentown, Pa., first president of the association, was read, as was also a telegram from F. D. Carpenter, Lima, Ohio, third president, who was detained at home owing to the serious illness of his wife.

REMINISCENCES OF THE PAST-PRESIDENTS

Mr. Nicholl, second president of the association, stated that there were only twenty electric railway members when he was elected and that after every effort had been put forth to induce more companies to join, the year ended with only twenty-two members. The small mileage represented and the consequently small working capital greatly hampered the progress of the association work. It was not until the organization of the subsidiary traffic association that the parent association could afford to have a permanent headquarters and a secretary devoting all of his time to the work, which were the things most needed. The membership has since grown to include sixty-nine railway companies, operating practically 4900 miles of track, and two important city properties in addition. Thinking back over the work done by the association and referring to the capability of its personnel, Mr. Nicholl said that the progress of the industry in the Central West was assured and the future was bright.

Mr. Whysall recalled a meeting of the association in Fort Wayne at which only four members were present. There was no money in the treasury and it looked as if the association must fail. At this juncture Mr. Carpenter said, "Well, boys, we can't give up. Let's put in enough to carry it through another year." He quoted the secretary, A. L. Neereamer, who was one of the four present, as saying, "Just pay me enough to buy groceries and pay rent, and I will stick it out with you." That was only one of many instances in which Mr. Neereamer had demonstrated his great value to the association, and Mr. Whysall gave him credit for its principal accomplishments. This tribute was enthusiastically endorsed by the meeting.

Mr. Henry expressed his particular interest and liking for the Central Association because of its ability for both work and play. He said there was no reason why electric railway men should be going around with their chins hanging down, since, in the short time in which the city and suburban railways had been growing, they had increased the convenience and happiness of the public more than any other industry.

Speaking of competition the railways have had he said that the real menace of the automobile was fast becoming less because of the fact that the "fad part" of this kind of riding is disappearing. Its use for business purposes was a permanent institution, but the farmers and suburban residents were coming to ride upon the electric lines into cities because they could not drive their cars back and forth as cheaply.

They are beginning to consider the relative economy of the two means of transportation and are consequently turning to the electric lines and using the automobiles for business purposes in communities which the trolley lines do not reach. "All we have to do," said Mr. Henry, "is to keep up our service to a high standard and the traffic will come back." He said he was not discouraged at the outlook and did not expect to be, and that he found considerable pleasure in being able to furnish not only transportation on his line, but many other conveniences as well. Among these were the lighting of the streets and roadways, and the supply of power to farmers and for grain elevators and industries closely allied to the farmer. What he liked best about the Central Association was that the success it had attained came from a determination of the members to work together to bring results as a body.

THE JOINT INTERLINE FOLDER

E. B. Peck, Indianapolis, Ind., chairman of the joint interline folder committee, reported the completion and very favorable reception of the new folder.

The committee had arranged for its distribution in ninety-five cities located in seven different States, involving a total of 750 racks. In Chicago the folder was distributed in 122 racks, as well as in forty-seven racks in Detroit, thirty in Louisville, nineteen in Pittsburgh, and twenty-two in Cleveland. In Indiana 72 per cent of the electric lines were subscribers to the folder, repsenting 80.5 per cent of the total mileage. In Michigan 100 per cent of the electric railways had subscribed. In Ohio 45.5 per cent had subscribed and these represented 75.5 per cent of the mileage. In all, for the association territory, 55 per cent of the roads were subscribers to the folder, representing 81 per cent of the total mileage. Following the report a number of the delegates expressed appreciation and indorsement of the joint folder as the greatest accomplishment of the association or, for that matter, of any railway organization.

The first order of business after the noon luncheon was the unanimous approval of the following telegram addressed to His Excellency, President Wilson: "The Central Electric Railway Association, composed of the electric railways of the north central States, now in session assembled, begs to extend to you the assurance of its undivided loyalty and support in upholding the rights of our countrymen and the nation and to offer the services of this branch of the nation's transportation facilities for the rapid movement of troops and supplies in the event of war."

Following this there was read G. G. Roberts' paper on the revival of pure wrought iron, which will appear in a later issue. In the discussion, H. H. Buckman, New Albany, Ind., said that, in the safety first work in Evansville, which had been rather rigorously pushed, wrought iron had played quite an important part. He had first adopted it for brake rods and later for truck swing links, swing-link pins, car body transoms and other parts. He had tried all manner of steel bolts for the split gears on thirty-two cars, and while he had reduced the breakage he was able to eliminate it only when he had resorted to pure wrought-iron bolts. He had found that the wearing life of a piece of wrought iron subject to friction could be lengthened by hardening the wearing surface with cyanide.

R. N. Hemming, Anderson, Ind., told of his experience with steel brake rods and how his company had several very narrow escapes due to their breaking. He was now using pure wrought-iron rods altogether. He had found that any slight nick on a steel brake rod, resulting from a blacksmith's tool mark or from a blow in service, caused a weak spot and that the rod would break there. He had also substituted flat wrought-iron brake rods for round ones to avoid any forging. He asked Mr. Roberts how one could be assured of always getting pure wrought iron, and the latter replied that if the chemical means were not available to test it, he would try it out by a nick and bend test. Further assurance could be obtained by a visit to the manufacturer's mill, where one could see what material went into the puddle and could make sure by this means that absolutely no scrap was used. He said that any mill would give every opportunity to watch the process. Mr. Roberts was asked about the use of pure wrought-iron car axles and he said that, although he knew of some which had been unsatisfactory, they had not been properly made. He predicted that wrought iron would come back and displace its offspring—steel—for axles, as it was doing for other members. The original steel axles, he said, had broken and then were made larger. These broke also, due to granulation, and the process of increasing the size was continued until we now have the 6-in. and 7-in. axles. Yet these still break. He said that if every axle, after it had been in service six months, was tested by Mr. Hemming's process, which was described in the ELECTRIC RAILWAY JOURNAL for Nov. 11, 1916, practically all would show some slight fracture. He ventured the statement that this would not be the case with wrought iron provided the pure metal was used.

The association was made the guest of James H. Drew, president Drew Electric & Manufacturing Company, Indianapolis, for the Thursday noon luncheon, at which Harry B. Smith, Adjutant General of the Indiana National Guard, addressed the members. Mr. Smith said that the greatest need in the army organization was for the assistance of such men as those present who were experts in the business of transportation and knew how to move troops and supplies by the most direct routes and with greatest efficiency.

The annual banquet on Thursday evening was attended by more than 200 members and guests. Mr. Wilcoxon acted as toastmaster and J. A. McGowan and C. L. Henry made short talks. The dinner courses were interspersed with various entertainment features and dancing followed.

REPORT OF SECRETARY-TREASURER

A. L. Neereamer, secretary-treasurer of the Central Electric Railway Association, presented his report for the year ended Dec. 31, 1916. He said that the interurban membership now includes sixty-seven interurban lines, operating a total of 4890 miles, and two city lines. The increase in mileage over last year is due to the Michigan roads affiliating with the association. There are 153 supply members. The receipts amounted to $7,851, not including cash on hand of $978 at the beginning of the year. After paying expenses, the association had $1,644 in cash and had made an addition to its investment account of $571. The present investment account is $2,697.

REPORT OF TRAFFIC ASSOCIATION

As chairman of the Central Electric Traffic Association, Mr. Neereamer submitted a report of the work done during 1916. Five new lines now participate in the central electric interchangeable mileage ticket, the number of lines now using this ticket being thirty-five. During the year just past 5600 of these tickets were ordered and placed in the hands of the agents, making a total of approximately 39,000 tickets issued since the adoption of this form of transportation eight years ago by the interurban lines of the association. Reference is also made to joint and local baggage tariff No. 8, which has not been changed during the year, although changes are now under consideration; to official classification No. 43, covered by the association's I. C. C. No. 17, which was filed for thirty-eight companies. Sixteen supplements have been issued to this publication and filed by the chairman.

Of the thirty-eight lines appearing in official classification No. 43, thirty-four are now party to official classification No. 44, as filed by the chairman of the official classification committee. Joint freight tariff No. 13, covering exceptions to official classification, was issued Aug. 1, 1916, and has had two supplements. Joint passenger tariff No. 14 is now undergoing a process of revision, and it will be completed and reissued as early as possible.

The Future of the Interurban *

It Is Now Carrying the Burden of Early Optimism, but Has Become a Public Necessity—Concrete Suggestions for Improvement of Conditions

BY A. BENHAM
General Manager Ohio Electric Railway and President Central Electric Railway Association

IN addressing you to-day, I shall not go into a detailed review of the activities of this association during the past year. The secretary will set forth the condition of the membership and give in detail the financial condition of the association. I shall devote more attention to the interurban because in my opinion it has reached a crisis in its history, the intelligent treatment of which at this time may mean much to its future.

The interurban railroad, as an industry, had its beginning as extensions of the city railways and the first lines were short. The city properties of those days collected a 5-cent fare so that, when these lines were extended,

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*Abstract of annual address, presented at annual meeting of Central Electric Railway Association at Indianapolis, Ind., March 8, 1917.

the rate of fare was fixed at some multiple of five, that is to say, the line was divided into 5-cent fare zones. When the work of procuring a roadway was taken up, the notion of a privately owned right-of-way was probably not considered at all. As the street railroad was constructed on public property with satisfactory results, why should good money be spent for expensive real estate?

From the success of this new venture in electric railroading was born the idea of an inter-town service through territory which the steam roads did not reach or where steam road service was inadequate, and entirely new roads without any connection with city street properties were prospected all over the country. But the promoters were either men formerly associated with the street car service at one place or another, or were new Wallingfords seeking to build something that could be sold either before it was finished or very soon afterward. At any rate, for some reason they not only fell into the same error as did the pioneer suburban railway builder in the matter of roadway and fares, but they loaded the proposed system with other gigantic blunders which were to be fully as embarrassing and hurtful to the future owners and operators of the property and to the development of the property itself.

Having determined upon the terminal cities, our promoters then set about the work of selecting the route between, which was usually done by locating on the most thickly settled highways connecting the more important towns. There being a real demand for the character of the service promised, the work of interesting county road authorities and municipal councils was not difficult, and the promoter, out to get something for nothing, was willing to take almost anything that was offered. The one thing he insisted upon, and the last he should have wanted, was the occupancy of the principal streets in towns and villages. With that concession granted, he made but little objection to any other condition that might be imposed. The result was that for each town on the road map there was a franchise different from all others in practically every important detail, and in the franchises for the terminal cities there was fully as wide a variance. Some required an hourly service, some six cars each way every day. Nearly all provided for a city service with the rate of fare fixed and the cars were to stop at each intersecting street.

The contracts were usually for twenty-five years, and practically all bound the company to pay a large portion of future street improvements. Before another decade passes all of these original franchises will have expired. The task of securing renewals will be much more difficult than was the work of securing the originals, provided the contracting power remains as it is now, in the hands of municipal councils. When these lines were being promoted the towns and cities wanted them. Now they have them, the difference is obvious.

One of the things which the promoter failed to foresee, and which he could not have foreseen had he been ever so wise, was the advent of the automobile, and the profound if not positively disastrous effect it was to have upon the future of his road, especially its local business, and it is up to those who are charged with the operation of the properties now to make up this loss from what other sources they can. About the only avenues of possible new business that seem to be available at this time are three, namely, long-haul passenger business, a larger development of the freight traffic and the sale of electric current for light and power. All of these have been exploited with fairly encouraging results.

Other changes have taken place that materially affect the welfare of all carrying companies, and especially the interurban. They include new laws relating to employers' liability, changes in the attitude of the courts in personal-injury matters, creating new rules of negligence and the like, increased cost of everything that enters into railroad operation, and more exacting demands of the public, rendering the use of the most modern equipment necessary. All these things have put the interurban end of our business in a position that no man can predict with any degree of certainty the ultimate outcome. We do know, however, that we have become a positive public necessity to a very large portion of the public, and that we are each year growing in the public estimation, and I believe that eventually we will come out of our difficulties, but there is much to be done.

THE REMEDY LIES WITH THE COMMISSIONS AND PUBLICITY

The law-making bodies of the country, both state and national, have deemed the railroads, both steam and electric, of sufficient importance to the public at large that boards and commissions have been appointed to, in a measure, control their operations, and the experience of railroad men before such boards has been in the main very satisfactory. In the first place the boards are composed of men whose business it is to understand general conditions and general needs. They can just as easily understand local needs when considered in connection with general requirements. Why, then, if it is proper to empower such boards and commissions with the control of a part of the affairs of public service corporations, would not all concerned be better served if this power should be enlarged to cover the entire field of railroad affairs, and this to include the granting and renewal of local franchises, etc. In short, grant to the utilities commissions and public service commissions of every kind the power to decide all matters of every kind in controversy between the railroad company and the public.

It occurs to me that associations of this character should take an active interest in legislative matters affecting the interests of its members, both for offense and defense. Thus, in Ohio, there are now five or six measures before the General Assembly for which there is absolutely no public demand, but, if passed, they will inflict new and unnecessary hardships on the street and interurban companies. It is gratifying to note that the interests affected are making a strong opposition to these proposed laws, and with a fair prospect of success.

The men who have had the development of the interurban railroad in hand have done wonders for it in the way of physical improvements in the less than twenty years of its history. This association has done much to aid this progress, but much remains to be done. I am a firm believer in the wisdom of the public service corporation taking the public into its confidence in all of its affairs which affect the public. I believe, also, that we should make determined and organized effort to protect our interests against vicious legislation and that the association is in better position to take the initiative in these matters than are the members acting independently.

The accident problem is always with us. The companies are all doing what they can to reduce the number of accidents and with much success, but, unfortunately, these efforts do not to any great extent reach beyond their own organization. The traveler on the streets and highways is outside our range of effort. With this element, the association can be useful both in an educational campaign directed to the public in general, and in efforts to impress upon legislative assemblies the justice of a more equal division of responsibility in accident matters between the railroads and the public everywhere.

Power Bids Approved in New York City

New York Municipal Railway Corporation to Purchase Power for Operation of Its Portion of the Dual System of Rapid Transit—Building of New Power Station Thus Deferred Until Prices Become Normal

The New York Municipal Railway Corporation, a subsidiary of the Brooklyn Rapid Transit System and under contract with the city of New York to operate part of the new subways in Manhattan and Brooklyn, has been under negotiations with the Public Service Commission since February, 1915, looking toward the purchase of the necessary power for operating its Manhattan and Brooklyn lines. For the Manhattan lines the commission has approved and the company has accepted the bid of the Interborough Rapid Transit Company of 0.7 cent per kilowatt-hour for alternating-current energy and 0.825 cent per kilowatt-hour for direct-current energy at substation bus in both instances, and under certain definite load specifications given in detail later in this article. The price is also subject to modification in accordance with variation in the price of coal. For the Brooklyn lines the accepted bid is that of the Transit Development Company, a subsidiary of the Brooklyn Rapid Transit Company, and the price is 0.9 cent per kilowatt-hour for alternating-current energy at substations and for direct-current energy delivered to the third rail 1 cent per kilowatt-hour for the first six years and 0.99 cent for the last four years of the ten-year contract period. An adjustment, details of which are given below, is provided to take care of changes in the price of coal.

While negotiations were under way a careful study was made of all the available data in connection with the generation of power in the district through which the lines will operate. It was found that there were but four sources from which sufficient power could be obtained. These were the New York Edison Company, the Brooklyn Edison Company, the Interborough Rapid Transit Company and the Transit Development Company. The bid of the New York Edison Company for power in Manhattan and of the Brooklyn Edison Company for power in Brooklyn was 1.305 cents per kilowatt-hour when reduced to the same terms as the two accepted bids.

Reasons for Purchasing Power

In recommending the acceptance of the bids of the Interborough Rapid Transit Company and the Transit Development Company, Commissioner Hodge said they were the lowest prices at which power could be purchased in the desired amounts in this territory, and that they were lower than any other prices known to the commission or to its experts for steam-generated power supplied by public utility companies under similar conditions. He also called attention to the fact that the purchase of power at these rates will prove more advantageous to the city than the construction of a new plant at this time for the following reasons:

(a) An investment of over $10,000,000 will be deferred for ten years and the expenditure of $2,500,000 of this amount will probably be avoided altogether by the return to normal of market conditions in the meantime. (b) Power can be obtained sooner from existing Interborough and Transit Development sources. Temporary supply at higher rates during the construction of new power plant would partly or wholly offset the savings from the new plant. (c) By deferring the construction of the new plant for ten years it will be possible to design it to meet definite known load conditions, full operation having been established. As a result of future improvements in the art of power production it is reasonable to expect that greater economy can be obtained in a plant built at that time than at present. To build a plant now would probably fix the cost of power for many years to come, and leave little chance for a reduction ten years hence. (d) It is very probable that still more favorable rates for purchased power will be obtainable at the end of the ten-year period, making it unnecessary for a further period to invest a large sum in a new plant. (e) The existing New York Consolidated Railroad Company's system is now supplied largely from the power houses and substations of the Transit Development Company. To replace these now by a new plant would be an unnecessary duplication of plant and expenditure of capital.

Power for Manhattan

The energy which will be required to operate the Manhattan lines and upon which the Interborough based its prices of 0.7 cent for alternating-current energy and 0.825 cent for direct-current energy is given by the following tables, which also specify the load factor and the maximum energy that may be used in any given hour:

Direct-Current Energy Requirements for Manhattan

(Energy to be Metered at Substation D. C. Bus)

Year Beginning May 1	Maximum Hour	Kilowatt Hours for Year	Load Factor of Load
1917-1918	13,310	46,900,000	40.2
1918-1919	20,500	75,750,000	42.2
1919-1920	22,340	82,650,000	42.2
1920-1921	23,990	88,800,000	42.3
1921-1922	24,950	92,300,000	42.2
1922-1923	25,970	96,000,000	42.2
1923-1924	26,970	99,800,000	42.2
1924-1925	28,600	105,750,000	42.2
1925-1926	30,320	112,100,000	42.2
1926-1927	32,120	118,800,000	42.2
Average	25,000	91,885,000	42.0

Alternating-Current Energy Requirements for Manhattan for Lighting and Signaling

(Energy to be Metered at High Tension 11,000-Volt Bus)

Year Beginning May 1	Maximum Hour	Kilowatt Hours for Year	Load Factor of Load
1917-1918	820	4,235,000	58.7
1918-1919	1,010	5,190,000	58.7
1919-1920	1,280	6,541,000	58 2
1920-1921	1,390	6,902,000	56.8
1921-1922	1,390	6,902,000	56.8
1922-1923	1,390	6,902,000	56.8
1923-1924	1,390	6,902,000	56.8
1924-1925	1,390	6,902,000	56.8
1925-1926	1,390	6,902,000	56.8
1926-1927	1,390	6,902,000	56.8
Average	1,280	6,428,000	57.3

If the load conditions specified in these two tables are not met, the charge for energy is to be increased as follows:

a—When maximum hour of the year is equal to or greater than 95 per cent of the figures given in the tables, and when the load factor of load is less than 95 per cent of these figures, the estimated cost of fixed charges per kilowatt-hour at the substation bus (including profit) which was used in determining the charge for energy, namely, 0.325 cent for direct-current and 0.255 cent for alternating-current energy, is to be increased by the ratio of load factor of load given in tables to the load factor of load actually obtained. The difference between this new figure for fixed charges and the figure originally estimated will be added to the total charge for energy per kilowatt-hour.

b—When both maximum hour of the year and the kilowatt-hours per year actually supplied are less than 95 per cent of the figures given in the tables, the estimated cost of fixed charges per kilowatt-hour at the substation bus (including profit) which was used in determining the charge for energy, is to be increased by the ratio of the kilowatt-hours per year as given in the tables to the kilowatt-hours per year actually supplied. The difference between this new fixed charge figure and the figure originally computed will be added to the charge for energy per kilowatt-hour.

The actual maximum hour of the year is to be determined by averaging the maximum three hours of the year occurring on separate days.

The charge for energy is also to be increased or decreased according to any increase or decrease in basic cost of coal as compared with the price upon which the cost of power is based, namely, $3.23 per long ton of 2240 lb., containing 14,250 B.t.u. per pound of dry coal. The revised cost of coal per kilowatt-hour is to be determined by multiplying the cost of coal per kilowatt-hour at the substation bus (including profit) which was used in determining the charge for energy, namely, 0.310 cent for direct-current and 0.290 cent for alternating-current energy, by the ratio of original basic cost to new basic cost, both expressed in basic B.t.u. per dollar. The difference between this figure and the cost of coal per kilowatt-hour originally used in determining the charge for energy is to be added to or subtracted from the total charge per kilowatt-hour until the next change in basic cost of coal.

POWER FOR BROOKLYN

The Transit Development Company's price of 0.9 cent per kilowatt-hour for alternating-current energy at the substation bus at 6600 volts, and for direct-current energy 1 cent per kilowatt-hour for six years and 0.99 cent for the next four years is to be adjusted to take care of changes in the price of coal. The revised cost per kilowatt-hour is to be determined by multiplying the cost per kilowatt-hour which was used in determining the charge for energy, namely, 0.285 cent, by the ratio expressed by the fraction of which the numerator will be the average B.t.u. per dollar obtained by the Transit Development Company during the year 1916, amounting to 10,860,000 B.t.u., and the denominator of which fraction will be the average B.t.u. per dollar that will be obtained during any respective year of the life of the contract. The difference between this figure and the estimated cost of coal per kilowatt-hour used in determining the charge for energy is to be added to or subtracted from the quoted price for power. This rate will be the correct rate for energy for the preceding year.

American Fare Systems and Cars Urged for Edinburgh Congestion

Councillor M'Laren of the Edinburgh (Scotland) Town Council, according to the Edinburgh *Evening News*, is endeavoring to secure something approaching uniformity in regard to carfares in that city in order to reduce the overcrowding in the center of the city and redistribute some of the population in the suburbs. This Scotch newspaper has reproduced data on the fare system used in Winnipeg, Manitoba, and in Cleveland, Ohio, also an extract of a letter from Peter Witt in regard to the Cleveland front-entrance, center-exit car. Mr. Witt's letter reads as follows:

"Since the necessities of the war have placed women on your cars, and it being my belief that when the war is over these women will remain in the jobs they now occupy, I am sure that this car is the car that you need. Arranged as it is, it makes the collection of fares a simple matter. In fact, a person stationed at the fare box in a car of this design is in reality occupying a position such as women occupy in the handling of cash registers, which, no doubt, is the system employed in the stores of your city for the payment of goods."

COMMUNICATIONS

Classification of Trucks

THE J. G. BRILL COMPANY,
PHILADELPHIA, PA., March 6, 1917.

To the Editors:

I have been interested in reading the complimentary criticisms of S. A. Bullock's article on a standard classification for trucks which have appeared in recent issues of the ELECTRIC RAILWAY JOURNAL. I read this article with a great deal of interest when it was published and am very much in sympathy with any movement that will result in some standardization of names and classes and that will indicate alike to the builder and the purchaser the identical character of trucks that may be under consideration. There is no doubt that some such movement should be undertaken.

Outside of the individual shop confusion that would result from a change in the nomenclature, I can see nothing but advantage from such a scheme. The name or method of identification of the truck to the outside world (or, more properly speaking, to the purchasing fraternity) should definitely mean one thing. But there is no particular reason why the inside manufacturing name and designation should not be another.

I firmly believe something can and ought to be worked out of Mr. Bullock's suggestion.

W. H. HEULINGS, JR., Vice-President.

The "Aera" Policy a Departure from Right Principles

BROOKLYN, N. Y., March 7, 1917.

To the Editors:

I appreciate the reluctance of the JOURNAL to use its columns for urging upon the members of the American Electric Railway Association the adoption of any action which might incidentally be of financial benefit to the JOURNAL, but inasmuch as your publication reaches all members of the association I trust you will give me space to express the hope that the matter of continuing the present policy of the association in the conduct of the *Aera* will be brought before the annual convention next autumn by appropriate preliminary action on the part of the president and the executive committee.

There is a strong feeling in the association that pecuniary advantage to the association arising out of the *Aera's* advertising patronage ought not to be a consideration as against a question of ethical principle and sound policy. If, as I believe, the prevailing sentiment among the manufacturing members of the association is that *Aera* is not a desirable advertising medium, but that advertisements are continued therein by manufacturers and sellers of railroad apparatus in order not to incur any prejudice in the minds of the buyers of such apparatus, the association is certainly put in the position of silently using its influence in an improper direction, and what none of the member companies would justify for a moment in its individual corporate attitude is collectively upheld by the association. The issue, therefore, comes down practically to a request on the part of the association that in this indirect manner the manufacturing members should under the guise of advertising contribute largely to the cost of the association's publication. I do not believe that the association should stand behind such a departure from right principles.

Moreover, aside from the question of principle, there is the broad question of policy as to whether it is wise for the association to invade the field of electric railway journalism in competition with private enterprise. Certainly the interests of the railroad industry, if intelligently and adequately voiced by an independent outside journal, can be better subserved in the influence on public opinion which springs from such an outside independent source than by a publication by the industry itself, and to the extent that our competition diminishes the usefulness of technical journals we are injuring our own interests.

There is field enough for an association publication without entering upon this competitive undertaking, and the ability which has been shown in the conduct of *Aera* might well be directed along lines free from the criticisms which I have suggested. T. S. WILLIAMS.

The Advertising Policy of "Aera"

THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY
30 BROAD STREET,
NEW YORK, March 1, 1917.

To the Editors:

The reports of the sub-committee appointed by the executive committee of the American Electric Railway Association, charged with the consideration of the advertising policy of *Aera*, published in your issue of Feb. 24, 1917, are of great interest to all members of the association. The high standing of all the members of the sub-committee and the evident careful thought which they give to the questions submitted to them make their views of deep import. The subject under discussion has already created considerable literature, and I rather hesitate to add to this rapidly growing compendium of views. The conduct of *Aera* in its present form involves an expenditure at the rate of about $22,000 per annum, and as such is contributed either directly or indirectly by the members of the association the subject is possessed of a direct financial interest to the electric railway industry. The cost at the present time does not seem to be of large moment, but involves a question of policy that may just as well be discussed at this time as later, when *Aera* may have attained that financial success which some of its more enthusiastic sponsors hope for. Knowing the breadth of view of the members of the sub-committee of the executive committee, I feel certain that they will encourage good-natured discussion of *Aera's* editorial and commercial policy.

Some of the points not heretofore discussed or only lightly touched upon and to which attention may be properly directed are the following:

1. The member companies of the association are in large part paying for the entire cost of conducting *Aera* now running at the rate of about $22,000 per year. About 82 per cent of this expense is covered by revenues derived mostly from the sale of advertising. This advertising comes in substantial part from the manufacturers and dealers in equipment and materials used by the electric railway industry. It has to be paid for, and is accordingly represented in the cost of business done by such dealers. It, like the commercial traveler's barber bills, is thus largely borne by the member companies, although they may not readily recognize it. The financial statement of deficits, set forth in the majority report on page 340 of your issue of Feb. 24, accordingly does not represent the over-all account as between the member companies and the magazine.

2. I have no doubt that the merits of *Aera's* advertising space are presented without regard to any desire to influence the prospective advertiser through fear of exhibited unfriendliness to the association or the industry. Manufacturers recognize the advantages of advertising, but naturally do not care to spend money on the purchase of any space to reach fields which they feel are adequately served. They naturally assume that *Aera* reaches the hands of only those prospective purchasers already reached by other journals carrying more comprehensive advertising of the complete lines. Manufacturers and dealers will naturally be somewhat cautious about expressing their views on such advertising because such would defeat one of the purposes which they might hope to accomplish through the purchase of space in *Aera*. In this discussion they should be encouraged to publicly state their views, and I am sure that the executives of the railway industry are broad enough not to hold the interests of manufacturers when so expressing themselves, as opposed to those of the association.

3. The privately owned papers in the electric railway field are edited by able staffs. The business of technical journalism is one calling for special training and supervision. The association cannot hope to develop *Aera* to the same high standard as the magazines referred to without involving itself in expense which the promoters of *Aera* in their good judgment would long hesitate to recommend. Without an extended staff, *Aera* will necessarily remain a Class "C" magazine in this particular field. There should be nothing but Class "A" magazines, provided their publishers are competent and desirous of serving the entire field.

4. There was a time when some public utility corporations owned newspapers in order to get their views before the public. Some one figured out that it was cheaper to purchase advertising than it was to maintain a kept newspaper, and the industry thereupon made an important advance in public relations. If the association had difficulty in getting its news into print in the technical journals now serving the industry, it might be cheaper to purchase space than it is to maintain a separate magazine. Concentration of production and mobilization and correlation of resources are the watchwords of the day.

5. The originators of the plan of company sections did not contemplate that the movement was to be a source of expense to the association not fully covered by the dues of section members. Some means of maintaining contact between the association and the section members is necessary, but it seems that such should readily be effected and yet not prove a source of expense to the association. It has not so far been possible to do this by *Aera* without outside aid, such as contributions of advertising. This part of the company-section movement yet remains to be properly developed.

6. The association has done great work in the past, but it has its future ahead. The industry is confronted with more serious problems than at any time in its history. We require the united effort of all the people who live by and do business with the electric railways.

All the brains in the association should be concentrated on the study of the solution of our difficulties, and should not be dissipated on ideals, previous conditions and precedent. There are other lines of activity in which the association can spend its spare income which will be as productive of good results as have been the bulk of expenditures in the past. The association really requires a much larger income than it now has if it is to do for the industry what many believe can be done, and it has no present income to waste.

J. D. MORTIMER, President.

Recent Tendencies in Taxation

TAX DEPARTMENT, STATE OF NEW YORK
ALBANY, N. Y., March 8, 1917.

To the Editors:

In a paper on "Recent Tendencies in Taxation," presented by R. L. Rand before the New York Electric Railway Association on March 2 and abstracted in the ELECTRIC RAILWAY JOURNAL of March 3, certain statements were made which I have challenged in a letter written to Mr. Rand under date of March 8. A copy of this letter follows. You have my permission to publish this letter.

> Your article on "Recent Tendencies in Taxation," published in the March 3 issue of the ELECTRIC RAILWAY JOURNAL, has been read by me with special pleasure and interest. It is gratifying to note your expressed view in respect to the centralization of taxing authority, a view that is in harmony and accord with the efforts of the State Tax Commission to mold public opinion in favor of such centralization. The ELECTRIC RAILWAY JOURNAL, by opening its pages to the discussion of problems relating to taxation, and the New York Electric Railway Association, in availing itself of that opportunity for disseminating such discussions, are performing a real duty to the public as well as to the corporations directly interested. If, however, through this medium substantial results are to be expected, the discussions must be fair and unbiased and the pro and con of a debatable proposition must be presented.
>
> Your statements in reference to the net-earnings rule invite the observation that not by the rule, by the courts, or by the State Tax Commission is any fixed rate of return arbitrarily established, much less a 6 per cent return upon investment, as you state.
>
> While your discussion of negative intangible may seem logical from an academic point of view, the tax law of the State of New York clearly states that tangible property must everywhere be assessed at full and actual value. A negative intangible allowance would be analogous to reducing the assessment on a tenement because the owner thereof had failed to rent the same, even though the house were of exactly the same value as several others adjoining whose owners were more successful.
>
> Possibly from lack of information you mis-state the fact when you say, "Not only is the compensating benefit of paving not considered, but the State Tax Commission actually penalizes the railways for their compliance with franchise obligations. For in figuring the intangible value of franchises, it allows an earning capacity of 6 per cent on all property excluding paving, and in so doing it has been sustained by the courts." The only inference to be drawn from this quotation is that no consideration whatever is given by the State Tax Commission to the element of paving in determining the value of the special franchise under the net earnings rule. On the contrary, while the court denies the right to treat paving as tangible property, it explicitly states that the cost of paving may be considered in connection with the intangible element of the special franchise. The State Tax Commission in its application of the net earnings rule does take into account the original cost of paving.
>
> The court having ruled that such investment does not represent tangible property owned by the railroad but is on the contrary the property of the municipality, it is clear that such cost is a burden imposed upon the railroad by law and contributes nothing to the earnings of the railroad. Under these conditions the pavement cannot be taxed as tangible property. The compensation for this expenditure is made under the methods of valuation employed by the State Tax Commission by amortizing the original paving cost through a period of years representing the life of the paving. The annual amortization (or depreciation) of paving, together with all other properly deductible amounts, is deducted from the gross operating receipts before arriving at the amount of set earnings for capitalization for the intangible special franchise.
>
> Noting your statement regarding valuation—"Their (the Bureau of Special Franchises') methods at present are exceedingly crude and in addition disagree with those of the Public Service Commission"—while thanking you for your frankness of expression in what may be with you an honest opinion, the writer, with no feeling of resentment, though in pardonable disagreement, cordially extends to you the opportunity of obtaining by personal investigation through the deputy of the Bureau of Special Franchises, first hand information as to the methods employed. It is to be expected, however, that after such personal investigation your sense of justice to the staff of experienced engineers and accountants in the Bureau of Special Franchises will impel you to express as frankly and as publicly the opinion you may thus gain as to the methods of valuation employed by the Bureau of Special Franchises, as you did the grossly unfounded statement as to their crudity.
>
> P. B. WITTMER,
> Deputy State Tax Commissioner.

AMERICAN ASSOCIATION NEWS

Power Distribution Committee

Representatives of manufacturer members of the association are being added to the technical committees of the Engineering Association. Secretary Burritt writes that to date only the committee on power distribution is complete in this respect.

The following have accepted membership on this committee: C. C. Beck, chief commercial engineer, the Ohio Brass Company, Mansfield, Ohio; James H. Drew, president Drew Electric & Manufacturing Company, Indianapolis, Ind., and Francis J. White, the Okonite Company, New York City.

Standard Classification of Accounts

At the time of the October convention of the American Electric Railway Association the committee on a standard classification of accounts of the Accountants' Association, together with F. W. Sweney, chief examiner of accounts, and George Geekie, examiner of accounts of the Interstate Commerce Commission, held a somewhat protracted meeting and discussed accounting matters. At that time it was decided that as there had been so many questions submitted since the publication of Bulletin No. 9, by the Interstate Commerce Commission, it seemed advisable to get out a supplementary bulletin, and the representatives of the Interstate Commerce Commission agreed to formulate the questions and answers in the usual manner for publication. This they did and submitted a proof to the members of the committee in order that each member might have an opportunity to consider every case.

It was decided that the only way that everyone's views could be properly considered was to meet together and weigh any differences of opinion that might exist.

A meeting was accordingly called to be held in Boston on Wednesday and Thursday, Feb. 14 and 15.

At the meeting there were present Alexander Wylie, assistant chief examiner of accounts, and George Geekie, examiner in charge of electric railway accounts, representing the Interstate Commerce Commission, as Mr. Sweney, chief examiner of accounts, found it was impossible for him to leave Washington any time during the month of February. All the members of the committee were present, and not only were the cases for which proof had been submitted carefully considered, but there were several cases where no final decision had previously been rendered owing to the fact that it had been found impossible through correspondence to reconcile all differences of opinion.

At this meeting the representatives of the Interstate Commerce Commission agreed that instead of issuing a supplementary bulletin, embodying only decisions on cases submitted since the publication of Bulletin No. 9, they would issue a new and complete bulletin embodying all of the old cases previously published as well as all the new cases. The old bulletin consisted of 346 cases and the new bulletin will contain about 450 decisions. It is hoped that the new bulletin will be published in time for issue before the next convention.

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Relays Serve Important Purposes on Alternating-Current Transmission Lines —Placing the Responsibility for "Off" Trolley Poles—Fastening Track Rails to Bridge by Arc-Welding—Trolley Wire Erection Costs, V—Stoker Problems Discussed on Witness Stand—Other Equipment Articles and New Devices

(Contributions from the Men in the Field Are Solicited and Will Be Paid for at Special Rates.)

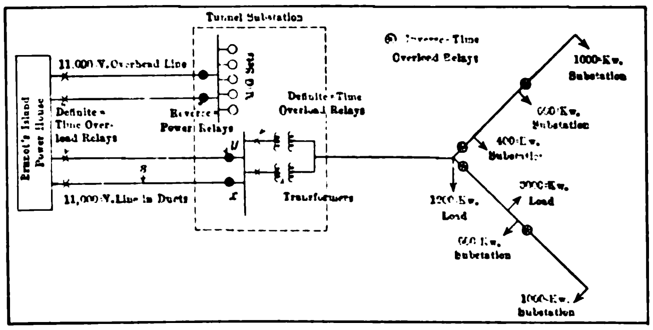
Transmission Line Troubles Localized by Means of Relays

Use of Definite-Time-Limit, Inverse-Time-Limit and Reverse-Power Relays Described

BY J. W. WELSH
Electrical Engineer and Traffic Agent Pittsburgh Railways, Pittsburgh, Pa.

In railway work the rigid requirements of continuity of service together with the complicated alternating-current transmission lines have made necessary the use of relays in order to localize at once any short-circuit or other disturbance in the system so that the power can be kept on as many lines as possible.

The accompanying diagram, which represents part of the layout of the alternating-current transmission lines of the Pittsburgh Railways, shows how three types of relays are used to protect the system. The three types are the inverse-time-limit relay, the definite-time-limit relay, and the reverse-power relay. The first named is set to operate after a certain minimum time after the overload occurs, and when this minimum period has elapsed the heavier the overload the quicker the relay will act. The definite-time-limit relay operates at a definite time after the overload occurs, and the reverse-power relay acts in the same way as the inverse-time-limit relay, except it will only open the circuit if the power is flowing in reverse direction.



PART OF A. C. TRANSMISSION SYSTEM, PITTSBURGH RAILWAYS, ILLUSTRATING USE OF RELAYS

Beginning at the end of the system furthest away from the generating station, the time limit on each successive relay is increased by a sufficient amount to allow time for the preceding relay to act and open the circuit breaker. In this way any section on which trouble occurs is automatically disconnected from the line without interrupting the power on parallel feeders or on sections between the faulty section and the power house.

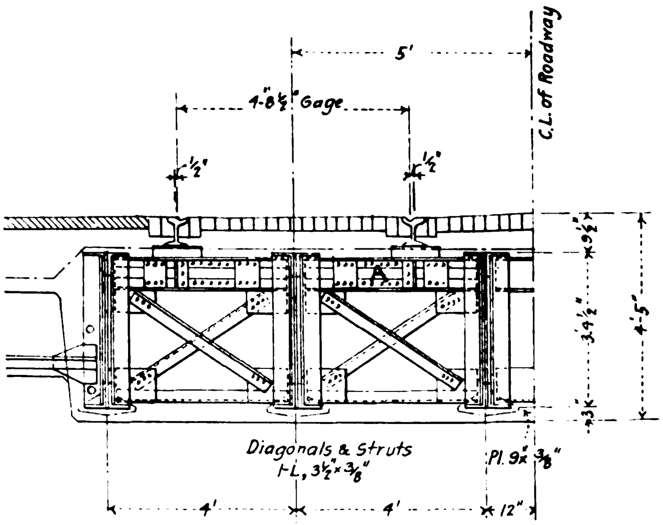
The most useful application of the reverse-power relays is for parallel feeders, such as the 11,000-volt transmission lines shown in the diagram. Should a severe short-circuit occur on one of these parallel lines, say at *S*, it would of course be fed from both directions. The current passing through the reverse power relay *x* would open the circuit at that point, and thus the other parallel line would be relieved of the effect of the "shorted" line, and power on the former would not be interrupted. Without the use of the reverse-power relays the circuit breaker at *y* would probably be tripped, and thus both parallel feeders would be cut off and the power beyond that point would be interrupted.

Arc Welding Rails to a Bridge

Drilling of Large Number of Holes Through 3½-In. Steel Avoided by Spot-Welding

BY R. C. CRAM
Assistant Engineer Way and Structure Department Brooklyn Rapid Transit System

New ways in which the arc welder may be used are constantly being reported and they are naturally of considerable interest to those who have welders in service. It may not be out of place, therefore, to describe another instance in which the welder helped to solve a problem which, at first, appeared to be somewhat difficult.



PART OF BRIDGE STRUCTURE, SHOWING RAILS AND CHAIRS TO WHICH THEY WERE SPOT-WELDED

It became necessary to install new rails on a new bridge recently built by the New York Connecting Railroad to carry a street over its new right-of-way at Grand Street in the Borough of Queens. As will be seen in the illustration, the bridge plans provided that the street railway rails were to rest on chairs which in turn were rigidly fastened directly to the top flanges of the top struts between the three main girders under each track. Incidentally the chairs were made up of plates of a thickness sufficient to make a total depth of chair of 3¼ in.

When the bridge was in place ready to receive the rails, it was found that no provision had been made for fastening the rails to the chairs either by bolts or clips. Apparently it was expected that the drilling in the field of the necessary vertical holes through about 3½-in. steel at the edges of the rail bases in severe winter weather would be a simple task, to say nothing of the fact that some eighty holes would have been required to install the rail with bolts or clips.

The suggestion was finally made that the rails be held in place by spot welding the rail bases to the chairs. An Indianapolis welder was used, and two spots, each about 1½ in. long, were placed at the edges of the base of rail and staggered so they would not come directly opposite each other.

Standard 2-in. by ⅜-in. flat tie rods were also installed on 6-ft. centers and at a height above the rail base substantially level with the top of the concrete paving base when laid flat. This was to prevent their interference with the paving surface.

There were no rail joints upon the bridge as the span is about 34 ft. while the rails are in 62-ft. lengths placed so that the joints will be about 14 ft. away from the faces of the abutments.

Why Does the Trolley Wheel Leave the Wire?

The Author Puts Part of the Trouble Up to the Mechanical Department and Urges Co-operation Between the Departments Concerned

BY S. L. FOSTER
Chief Electrician United Railroads of San Francisco

When, as sometimes happens on the best regulated roads, a trolley pole leaves the wire either at a frog, in a curve or on the straight line, there are three classes of observers: the general public, which takes only passing interest in the occurrence; the representatives of the operating department, who usually promptly assign the blame to the lineman, and the embryo inventors, who at once begin to worry over the problem of devising something that would have automatically replaced that pole on the wire.

The would-be improvers of the present rigidly simple overhead contact mechanism have invariably come from some occupation other than electric railroading, and have been quite numerous in the past twenty-eight years. But all have failed of pecuniary success in this field, because, after perfecting their devices and securing their patents, they have found it impossible to overcome the practical railroad man's two simple objections. He refuses absolutely to adopt anything that will put additional weight or additional bulk on the end of the trolley pole. The former would necessitate an increase in the strength of the trolley-base springs and in the damage done to the overhead construction when the wheel leaves the wire, while the latter would increase the hazard of the wheel catching in overhead "traps" and pulling the wires down. Then he clinches the matter by pointing out that he has no call for such a device anyway, for if every pole leaves at a particular frog it is clearly the fault of the frog, and if the pole of a particular car comes off at every frog it is clearly the fault of the car. In either case or in intermediate cases the fault is readily remedied much more cheaply than by putting an additional weight on the end of every pole on every car on the system as the inventor logically aims to do. Nothing has yet been found to beat the crudely simple operation of stopping the car and replacing the wheel on the wire by hand, the danger to overhead wires being meanwhile minimized by the use of retrievers or trolley catchers to restrain the pole from rising to a too-erect position.

We now come to the questions of why the pole came off, who was to blame and how a repetition could be prevented? Those responsible for the maintenance of the overhead wires get most of the blame and are the ones generally expected to remedy the trouble.

The frog may be badly constructed, but that is not likely in 1916 unless an improperly angled frog has been installed. The general usage now is for smaller degree frogs than in the past. Twenty-degree frogs are out of date, 15 deg. is a more suitable angle for all city "point-on" work, and even 12-deg. frogs are possible. For country work and trailing frogs everywhere 8 deg. is the preferred angle. One practical railroad engineer said nothing wider than 10 deg. was required anywhere.

The frog may be badly located, but that is not likely, either, unless the type of car has been changed since the frog was installed and the lineman has not been notified. After setting a frog linemen usually observe the results with numerous cars before leaving it. If a frog was located for a single-truck car and then double-truck cars have been substituted on this line or alternated with the single-trucks trouble is to be expected. Here the obvious remedy is to relocate the frog for best average results with the two types of cars and then to have all cars turn out slowly when passing that frog.

If the frog is badly worn on the pan by the flanges of cars passing straight through, the flanges of the turning-out wheels will be apt to follow the scores, to pass the frog and to come off the through wire beyond the frog. The remedy here is to install a new frog or, better, a case-hardened steel wearing plate to provide a new flat riding undersurface for the pan of the frog. Sometimes the trouble is due to one of these wearing plates being cut into by the wheel flanges or loosened, which calls for a new plate. Again, the frog may be out of level, the sides worn down, or the whole frog distorted by some accident.

In the troubles so far cited the lineman is the man to call on and he readily remedies them, but there are cases where he is sadly puzzled by inter-actions between frogs and trolley wheels which are altogether inexplicable until he begins to investigate the condition of the car equipment. Behind these baffling phenomena there may be a defect in trolley wheel, pole, harp, retriever or trolley base. Sometimes trolley wheels are allowed to wear until one flange parts company with the rest of the wheel altogether. This loose ring of brass cannot escape from the harp, and the "rattletrap" goes jumping along the line doing all sorts of highly improper things to the overhead. Thrifty carhouse men, when they find a trolley wheel wearing entirely on one side of the score, reverse it and let it wear on the other side. Such a wheel finally becomes so wide at the bottom of the score that it will "split" a frog and take the wrong direction in a most disconcerting manner. Trolley wheels often develop flat spots, making the wheels bounce and arc as they proceed. Such wheels often fail to act normally at frogs. Then graphite bushings burn out and contact springs lose their elasticity, allowing a wheel great freedom to jump elsewhere than it is supposed to go.

In locating the frog the lineman figures on a normal car. When a prudent shop man repairs a broken trolley pole, leaving it a foot or two shorter than standard, he is not sending out a normal car, but very few linemen will detect the cause of this car's pole leaving the wire while the other cars of the same type do not.

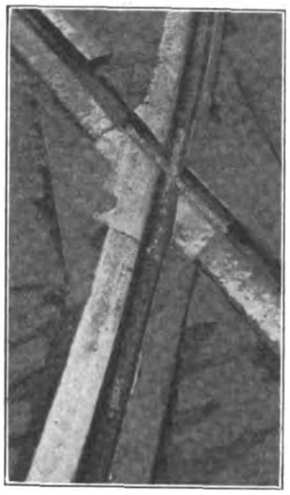
Retrievers also take a hand in complicating the situation. Some are located near the center of the dash while others are located far off center. Some exert a pull of 2 lb. while others bind the rope so that a man cannot pull it out of them at all. An off-center retriever exerts a different pull on the wheel, depending on whether the car is turning off to the right or to the left. On a rainy day, when the trolley rope is stiffer than on a dry day, the retriever yields up the rope more slowly, while some retrievers actually pull the rope off the wire on curves by failing to yield up rope fast enough. All retrievers exert an appreciable tendency in that direction. The best safeguard seems to be to adjust the retriever to the least tension compatible with rolling up the slack rope when the pole is down under the roof hook, and to proceed around curves at reduced speed. The trolley base should, if possible, be located so that when the wheel is on the wire the trolley rope will clear the edge of the roof. If that is not feasible the edge of the roof should be provided with half-round or half-oval iron, so that the rope can slide readily along it as the car passes around curves.

There are modern trolley bases, obsolescent bases and obsolete bases. The modern base with ball or roller bearings certainly gives the overhead frog and the trolley wire on curves a square deal as to adapting itself to what is expected of it. The older base with its vertical shaft, which relies on periodical lubrication for free action, is not always so dependable. If not recently lubricated or if the face has passed through a period of rainy weather it has a tendency to hold the pole in the same vertical plane as the longitudinal center line of the car, whether on the straight line or on curves. The result is that the trolley wheel leaves frogs unexpectedly and even comes off in the middle of curves. When there is full freedom of action due to the bearing surfaces being well lubricated or provided with anti-friction appliances, there may be still trouble caused by lack of sufficient upward pressure between wheel and wire, due either to lack of sufficient tension in the base springs or excess of pull from the retriever. Opinions differ as to what is the most desirable net pressure to maintain between the trolley wheel and the trolley wire. For city work probably between 20 lb. and 30 lb. is the general practice. If the pressure is too low the wheel may bounce downward at the overhead special work, and if the base has free action and the retriever pull is enough when the wheel again reaches the level of the wire it may have moved slightly sideways. The result may be either that the wire lands between the wheel and the side of the harp or misses the harp altogether. In the former case the wheel will slide along to the next splice in the trolley, where it will bounce off the wire mysteriously.

New types of cars continue to come upon the scene, and probably will keep on appearing with different roof heights, wheel bases and car-body lengths. The cars of each type should, however, agree among themselves. The wheel bases of the trucks and the roof heights cannot be changed, but the location of the trolley base on the roof and the length of the trolley pole can be and are sometimes changed. The overhead work is located for a certain standard car, and to have the trolley base on one end of a car 6 in. or a foot further away from the car center than the base on the other end secures no advantage to those maintaining the cars, and really handicaps those maintaining the overhead construction.

Where the road is small and one man looks after both cars and overhead all things will be adapted to produce the best results for all parts. Where the system has a different head in charge of each department there is need of intelligent understanding of each other's problems and co-operation to secure the best results.

Old 60-lb. Rail Used to Repair Special Work

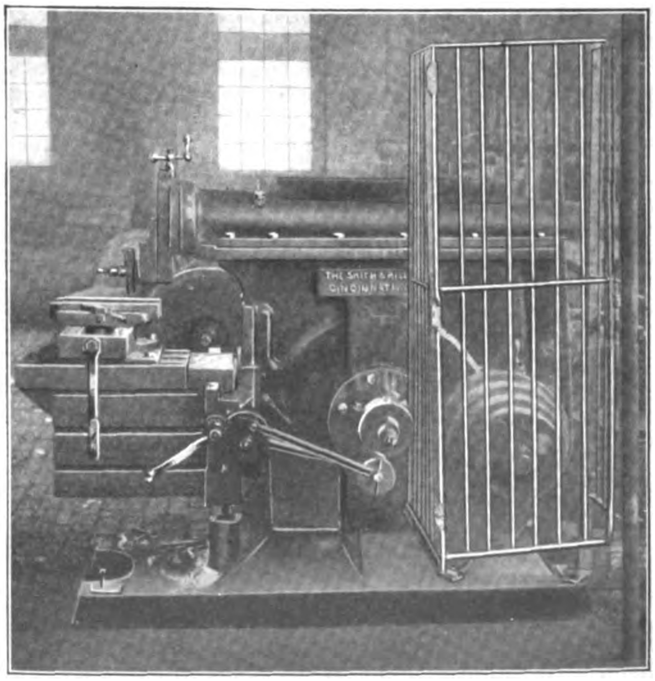


SPECIAL WORK ON CURVED TRACK REPAIRED

The Puget Sound Traction Light & Power Company, of which E. J. McIlraith is superintendent of way and structures, is practising many economies in track maintenance. The illustration shows one of the ways in which special work, some parts of which have worn out, is repaired so that three or four years more of life are secured. The guard rail just beyond the crossing is the original rail and shows considerable wear. On the near side of the crossing it has been replaced by old 60-lb. A. S. C. E. rail. The base of this rail is cut away to clear the casting which holds the manganese steel insert, and the casting is also trimmed to provide a good bearing surface. Then, with the head of the rail supported on the casting, molten zinc is poured around it and between the rail and the casting. The illustration also shows how the ends of the running rail adjacent to the crossing have been built up by electric welding.

Window Guards to Protect Belts

In the shops of the Beaver Valley Traction Company, New Brighton, Pa., old window guards are used to protect exposed pulleys and belts. The accompanying illustration shows three of these guards fastened together and bolted to the base of the shaper. These make very substantial guards, and they are stronger and more satisfactory than wooden strips or wire screening which are used in many shops. Since the railway had the old guards the expense of using them in the protection of apparatus in the shop was small.



BELT PROTECTED BY OLD WINDOW GUARDS BOLTED TO FRAME OF MACHINE

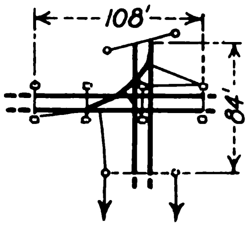
Cost of Erecting Overhead Work—V

(From the records of a large Eastern company)

The following is the fifth group of a series of diagrams with figures to show the actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. The preceding groups of this series were published in the issues for Jan. 20, page 127; Jan. 27, page 173; Feb. 10, page 260; and Feb. 24, page 355.

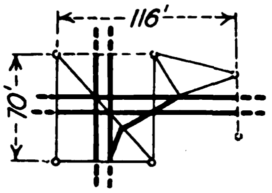
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Double track crossing double track with single track connecting curve crossing two main line tracks, 90 deg.



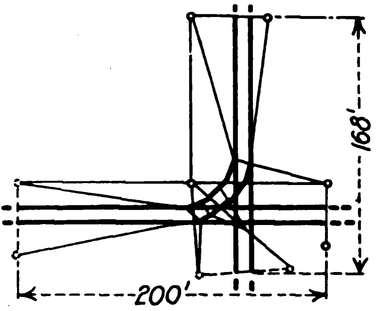
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
32*	$27.23	$19.80	$32.67	$23.76	$43.56	$31.68

Double track crossing double track with single track connecting curve crossing one main line track, angle 90 deg.



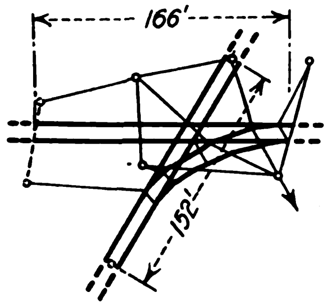
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
33*	$27.23	$19.80	$32.67	$23.76	$39.93	$29.04

Double track crossing double track with double track connecting curve, angle 90 deg.



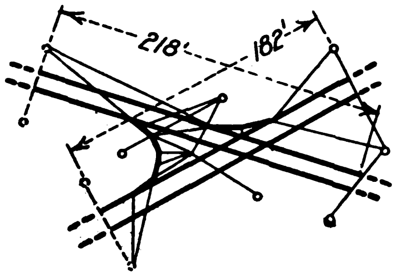
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
34*	$36.30	$26.40	$45.38	$33.00	$54.45	$39.60

Double track crossing double track with double track connecting curve, angle 60 deg.



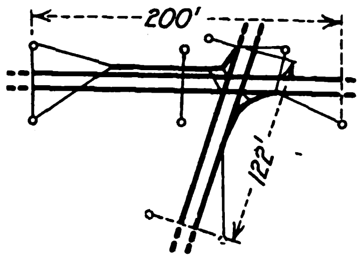
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
35*	$36.30	$26.40	$45.38	$33.00	$54.45	$39.60

Double track crossing double track with single track connecting curves in two adjacent corners, angle 45 deg.



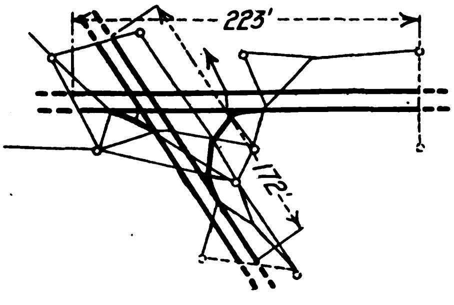
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
36*	$36.30	$26.40	$45.38	$33.00	$54.45	$39.60

Double track crossing double track with two single track connecting curves in opposite corners, angle 75 deg.



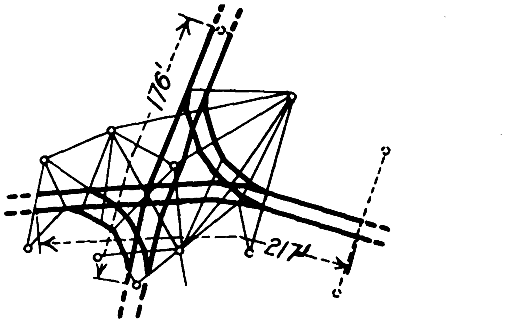
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
37*	$32.67	$23.76	$41.75	$30.36	$50.82	$36.96

Double track crossing double track with single track connecting curves in two adjacent corners, angle 60 deg.



No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
38*	$36.30	$26.40	$45 38	$33.00	$54.45	$ 39.60

Double track crossing double track with double track connecting curves in opposite corners, angle 60 degress.

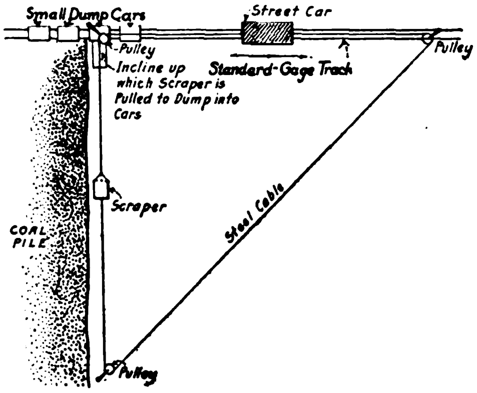


No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
39*	$54.45	$39.60	$72.60	$52 80	$81.68	$59.40

*Trucking includes cost of extra reel truck. None of the figures on this page includes cost of superintendence and engineering.

Street Car Used as Tractor for Loading Coal

To transfer coal from the power station storage pile to the small dump cars which, in turn, carry it to the boiler room, the scheme shown in the accompanying illustration is used in Moline, Ill. A scraper, attached to a steel cable and drawn by an old street car, takes the coal from the pile, drags it up the incline and dumps it into the small cars which run on an adjoining track. The street car is then backed up, pulling the scraper back into the coal pile where it gets another load.



SCHEME FOR LOADING COAL WITH SCRAPER DRAWN BY OLD STREET CAR

Another case in which a street car served the purpose of a tractor was described in the ELECTRIC RAILWAY JOURNAL for Jan. 6, 1917, page 44. In that instance a car hauled a scraper which was used in distributing ballast.

Combustion in the Underfeed Stoker

Former Interborough Rapid Transit Company Engineer Discusses This Subject on the Witness Stand

An interesting discussion of the relative merits of overfeed and underfeed stokers was a feature of a recent hearing before the Massachusetts Gas and Electric Light Commission. Reginald J. S. Pigott, power superintendent of the Remington Arms Company, Bridgeport, Conn., in discussing the adequacy of the Boston Edison Company's generating station, said that the underfeed stokers improve the combustion greatly, and that in burning soft coal there are two distinct operations that are performed. One is the gasifying and burning of volatile matter in the coal, and the other is the combustion of the remaining fixed carbon. In the old overfeeders the coal was pushed upon a coking plate. At the top of the grates, where it came underneath a brick arch, where it received the heat from the more intensely heated portion of the oven, the combustion would distill the volatile matter, and that would float off in the coking arch mixed with a certain amount of air and would burn as a gas in the furnace. The coke which remained after the expulsion of the volatile matter would continue down at the grates and would burn in much the same manner that a hard coal burns.

The difficulty with that process, as explained by Mr. Pigott, is that there are practically three zones in the fire. The first zone is in front of the coking arch, which is usually under the front end of the boiler, and as a rule the mixture at this point is rich in gas and lean in air. The second is the middle section, where there is still some gas flowing over from this rich zone, and where the burning of fixed carbon on the grate begins to take place at a rapid rate. Here the mixture of air and combustible is the best. The third section is at the lower end of the grate where the volatile matter is all gone and the coal burns to ash. In this section there is usually an excess of air. To obtain the best results from every heat unit in the coal you should have two conditions—a thorough mixture of the volatile matter with the air and the completion of combustion before the mixture of air and gases is chilled by being thrown against any duller surface which extinguishes the flame. In an overfeed stoker the long flame that may be seen going through the breeching means that each molecule of combustible goes a long way to meet its molecule of oxygen.

Mr. Pigott further testified that the process with the underfeed stoker is essentially different. In this stoker the green coal comes from underneath, and as it approaches the surface the air which is blown through from the cast-iron portions of the support mixes with the coal and passes through the interstices between the lumps of coal. As the green coal comes nearer and nearer the surface it is heated and distills off its gases. The gases and air pass toward the surface of the fire, and every lump of coal acts as a means of mixing them. Furthermore, the gas and air have to pass through the bed of burning coke on top, and have the finest chance in the world to complete their combustion at that point. The proof of this is shown by an examination of the length of flame, which with the underfeed stokers is noticeably shorter than with the overfeed. The net result is a gain in economy of 10 to 12 per cent in favor of the underfeed stoker. Also the temperature is apt to be higher because the combustion conditions are better than with the overfeed.

Another feature is the tremendous forcing capacity of the underfeed stoker. Mr. Pigott said that he had run a 520-hp. boiler at the Seventy-fourth Street station of the Interborough Rapid Transit Company, New York City, at 400 per cent rating for one hour without any distress of the boiler. The only reason for his stopping was that he did not have draft enough to take the furnace gases from the boiler. It is common practice not only with the Interborough, but with the New York Edison and other companies, to make use of this high forcing capacity, particularly for peak-load stations, with this advantage, that you install less equipment to carry your peak load. As an instance of this the installation of 30,000-kw. turbines at the Seventy-fourth Street station was cited. The original installation consisted of eight 520-hp. boilers and one 7500-kw. engine. In 1913 Mr. Pigott put in the first 30,000-kw. turbine, occupying the same floor space as the engine and driving it with the same eight boilers that were used for the engine.

Pneumatic Switch Cylinder Oil

To insure the proper operation of pneumatically operated unit switch cylinders for railway control the Westinghouse Electric & Manufacturing Company has brought out a lubricant suitable for this purpose, known as HL oil. For general lubrication No. 2 grade is used. This oil is sufficiently liquid to permit its being used in an ordinary oil can. It is applied without disassembling the switch group, by injecting in the hole in the top of each cylinder casing about ¼ oz. (two teaspoonfuls) for every 10,000 miles traveled by the car under ordinary operating conditions. If this does not produce sufficient results the oil can be used more frequently but only the minimum amount that will give free operation should be used.

Constant-Current Transformer Suitable for Pole-Mounting

Series street lighting systems require constant current, and constant-current transformers have always required a substation with control panels and an attendant. On that account it has been difficult to provide street lighting for smaller towns and villages where the revenue derived would not be sufficient to warrant such an installation. To meet this difficulty the General Electric Company, Schenectady, N. Y., has just perfected the first automatic, pole-type, constant-current transformer for use at points distant from the power station.

This is known as the type R. O. transformer and does not require a substation or an attendant. The transformers possess current regulation as close, and through as wide a range as is given by the best station type of constant-current transformer. The current from full load to no load is maintained within 1 per cent of normal. This feature materially prolongs the life of Mazda lamps operating on the circuit which it controls. The efficiency is the same as for the station type transformer and the high power factor is high.

CONSTANT-CURRENT TRANSFORMER SUITABLE FOR POLE MOUNTING

As shown by the illustration each transformer is mounted in a cylindrical steel tank with leads brought out through bushing holders similar to those of a standard potential transformer. This tank is filled with the same high grade insulating oil used in GE standard type-H transformers. All precautions have been taken to make the type R. O. transformers weather-proof and they should require no more attention than a constant potential pole-type transformer.

Varied Functions of a Railway Chemical Laboratory

Extensive use of a well-equipped chemical laboratory is proving indispensable as a source of economy to the United Railways of St. Louis, Mo. This company, besides making tests to determine the grades of various purchased materials, also has facilities for manufacturing many products.

Tests are made to determine the heat value, amount of ash, moisture, etc., in samples of all the coal used, which sometimes exceeds 300 cars per month. About 20,000 gal. of lubricating oil are used monthly and 4000 gal. of gasoline. The color and viscosity of the oil are noted and its flash and fire points are determined. The vaporization points of samples of all the gasoline are found by a system of distillation which is replacing the gravity determination. The laboratory is equipped to make tests on steel rails and ties, and has a machine for testing cement.

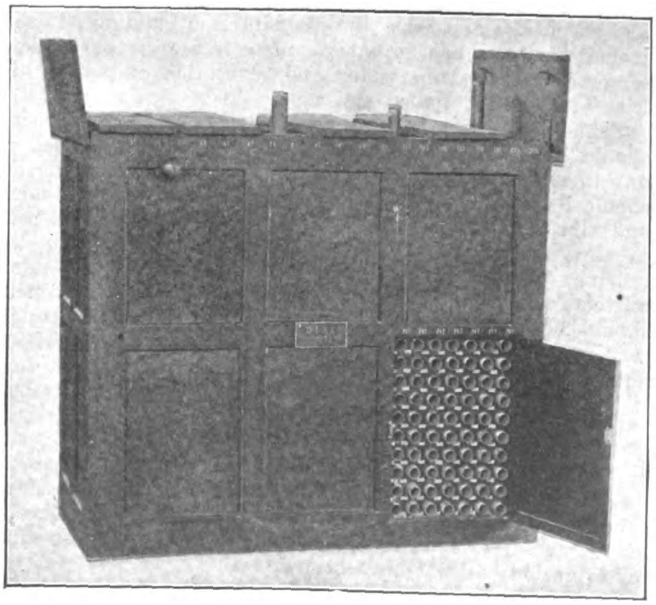
The company manufactures its own paint removers, disinfectants, roofing cement, metal polishes and soft soap for cleaning cars. Paints are compounded and tested, and fire extinguishing liquids are prepared as well as cutting compounds for use in the shops and body polishes for autos and trucks. Used oils are cleaned chemically or mixed with coal oil for very rough work, and a great saving is made also by distilling old paint remover for reuse.

Dynamite Reduces Cost of Excavating

Contractors and engineers, feeling the shortage of common labor for general excavation work, have been eager to adopt various labor-saving methods. Among these is the use of low grades of dynamite. A high-grade, quick-acting explosive, giving a shattering force necessary to blast rocks is not satisfactory for general use. Manufacturers have prepared a slow-acting, insensitive and low-freezing dynamite which is safely handled and can be used in conjunction with mechanical excavators to give more satisfactory results in earth work. It is used to blast obstructions ahead of steam shovels to secure a maximum efficiency of the machinery, and has assisted in plowing and in the use of hand tools on smaller projects. Its low-freezing quality enables the work to be prosecuted when necessary regardless of weather conditions. The method generally pursued has been to do the firing at a time when it will not interfere with other operations.

Magazine for Filing Blueprints

A map-filing magazine which affords a handy method of filing blueprints, has been developed by E. C. Deal, vice-president North Carolina Public Service Company, Greensboro, N. C. It consists of several rows of tubes in which are filed the removable pasteboard tubes containing the maps. Each tube holds six maps, and the magazine, occupying much less space than that required for drawer files, contains a total of 1620. The tube protects the map from damage while it is removed for use and also when other maps are being selected. All maps are listed in an indexed book which gives their numbers corresponding to numbers on the filing case and the tubes where they are filed. The use of numbers instead of titles greatly facilitates the work of filing, especially if the maps or blueprints are numbered on the back of all four corners. The magazine has a lock for each part and all are operated simultaneously by a single key. It is not yet on the market but letters patent were secured.


MAP OR BLUEPRINT FILING MAGAZINE, SHOWING COMPACT ARRANGEMENT OF TUBES

News of Electric Railways

Traffic and Transportation

Financial and Corporate | Personal Mention | Construction News

Thompson Committee Reports

Inquiry Into New York Commissions Results in Suggestions for One Commission of Seven Members

Senator George F. Thompson, chairman of the joint legislative committee that investigated the Public Service Commissions of New York, submitted the committee's report to the Legislature on March 5. It contained a severe arraignment of the commissions, declared that there had been no concentration of power or authority, and consequently no responsibility, and, because the commissions did not have sufficient jurisdiction to enforce their policies, they became careless of what they did. Senator Thompson's report reads:

"Impotent as a body, they [the commissions] apparently readily succumbed to their immediate surroundings and carried out no permanent policy, but the record of the investigation shows an almost uniform line of inconsistent conclusions. While not all of these have favored the corporation's contention, yet the neglect of enforcement has made it appear as though the whole line of conclusions recorded were without exception in the interest of the corporation sought to be regulated. This has produced a lack of confidence in the whole system, and consequently both commissions have been inefficient when measured by correct standards."

ONE COMMISSION SUGGESTED

To make the commission efficient it is suggested in the report that instead of two commissions divided by territorial lines there should be but one, to consist of seven members, six to be elected by the people and a chairman to be appointed by the Governor. The chairman and the two commissioners should sit in Albany to hear appeals from the decisions of the other four, who should have control over the various public utility corporations in fixed districts.

In the opinion of the committee the public interests would be better conserved by this method, and the cost of the work would be decreased $400,000 a year, which is now paid for "needless salaries." In referring to the building of subways in New York City, the report said that this work should be under the control of high-class engineers and executives and that "the planning and building of rapid transit facilities has no natural place in any proper scheme of governmental supervision and regulation of public utilities." The report also says:

"The committee believes that somewhere a provision should be made whereby a trial of all issues involved in any investigation or proceeding had before the commission should be heard before an unbiased and competent tribunal and that ample and adequate power should be reposed both in the commissioners who shall investigate and in the tribunal that shall render final determinations. The committee further feels that the procedure in both instances should be definite, expeditious and available alike to all persons, corporations and municipalities affected. Without question a reorganization of the commissions must be had if these results are to be achieved."

In a preface Senator Thompson said:

"If the public can be informed sufficiently to insure itself against that class of public officials who blatantly espoused virtue in seeking office, and, being successful, used the office for personal satisfaction or ambition while hypocritically making a superficial record apparently proper, then this investigation will not have been in vain."

Senator Thompson, on March 6, gave out a special report, just completed by that committee, on the proposed West Side improvement in New York City. The report attacks the contract which the city is now considering, on the ground that it gives the New York Central Railroad a monopoly of terminal facilities, and recommends the repeal of the law, passed in 1911, authorizing the Board of Estimate to conduct negotiations with the railroad for the removal of its tracks from grade and their electrification.

Decision in Extension Case

Missouri Supreme Court Declares Public Service Commission Has No Power to Order United Railways Extension

The Supreme Court of Missouri, in a decision rendered on Feb. 26, held that the State Public Service Commission had no authority to order the United Railways, St. Louis, to extend its tracks on streets on which it held no franchise, and ruled that two sections of the new city charter are inoperative and of no effect. These sections of the charter conferred upon the city the power to regulate its public utilities. The court held that when the Legislature enacted the Public Service Commission law, four years ago, giving to that body the power to regulate all public utilities in the State, the State assumed direction of them and city authorities were stripped of regulatory powers.

One section of the city charter, nullified by the Supreme Court's ruling, is Clause 13, Sec. 1, Art. 1, which states that the city shall have power to regulate the construction, maintenance, equipment, operation, service rates and charges of public utilities, and compel from time to time reasonable extensions of facilities for such service. The other section affected is Sec. 2 of Art. 19, which says: "The Board of Aldermen shall at all times have full power to be exercised by ordinance, over all public utilities now or hereafter existing in the city, and may regulate the charges for the use, service or product thereof and establish whatever requirements may be necessary to secure efficient use, service or products, and no terms or conditions contained in any grant shall limit or impair this power."

DECISION ON APPEAL

The decision by the Supreme Court was rendered on an appeal by the United Railways from an order of the State Public Service Commission, directing the railway to apply to the city within thirty days for franchises to extend its lines on new streets and into new territory.

The United Railways had first appealed to the Circuit Court in St. Louis which upheld the Public Service Commission. The case was then taken to the Supreme Court. The United Railways agreed to comply with all parts of the commission's order except the extensions, and the company's position was that the commission had no right under the Constitution to make such an order. This view was upheld by the Supreme Court, and in effect means that the Public Service Commission cannot compel the city to grant franchises to the United Railways on petition of the company, and cannot compel the company to seek franchises on new streets.

The city charter was not an issue in the case when it was before the Public Service Commission, but the conflict between the city charter and the public service act was raised in the United Railways' brief on appeal.

The Public Service Commission's order to the United Railways affected service, heating, ventilation, headway and extension of territory to accommodate better all sections of the city. An abstract of the conditions sought to be imposed by the order of the commission was published in the ELECTRIC RAILWAY JOURNAL of May 15, 1915, page 961.

Track Department Rearranged

Two Former Divisions of Brooklyn Rapid Transit Divided Into Three Sections

Important changes have been announced by C. L. Crabbs, engineer of way and structures, bearing upon the supervision of work in the surface track division of the Brooklyn (N. Y.) Rapid Transit Company by which the two former divisions, northern and southern, of the surface system have each been divided into three sections. Each of these sections will be directly in charge of a supervisor, who will report to a division roadmaster.

In the northern division F. Dunkak has been appointed roadmaster, with Supervisor A. J. Stratton of the bridge section, Supervisor R. C. Miller of the Maspeth section and Supervisor D. M. Connard of the Ridgewood section under him. In the southern division Roadmaster W. Dow will be in charge; with Supervisor E. H. Thomas of the Prospect section, Supervisor N. A. Parks of the Flatbush section, and Supervisor J. Dow of the Gravesend section under him. The line between the northern and southern divisions remains substantially as before, following Fulton Street and Jamaica Avenue.

In discussing these changes with a representative of the ELECTRIC RAILWAY JOURNAL, Mr. Crabbs said:

"In fixing these sections consideration was given first to area, with the intention of making the territory as compact as possible; second to track mileage included, and third to the amount of special work. Under these three general considerations, the sections are approximately equalized.

"The principal feature of this change consists in allotting certain territory to each of the assistants reporting to the roadmasters, instead of fixing initial responsibility upon the roadmasters themselves, as under previous conditions. The particular advantages gained are in the assignment of territory to each assistant or supervisor of an area small enough to permit him to become intimately acquainted with changing conditions without having his interest or attention distracted by other responsibilities and to permit closer supervision by him of any work under way in his territory. Other than by division of responsibility as indicated, this change does not interfere to any considerable extent with methods previously in use relating to plans for work, assignment of forces, handling of material and other divisional routine.

"It is believed that this change will result in increased efficiency, particularly in the direction of correlating our work and in anticipating maintenance requirements in the interest of ultimate economy, and it is hoped that all concerned will interest themselves in making the plan successful."

New York Subway Extension Opened

The Interborough Rapid Transit Company began operaton on March 3 as far as 219th Street of the White Plains Road extension of the West Farms branch of the first subway. Operation is by means of four-car trains composed of composite cars formerly operated on the underground portion of the first subway. A change is necessary to and from the White Plains Road trains at the 177th Street station on the West Farms line. The remaining stations north of 219th Street to the terminal at 241st Street will be placed in operation within the next few months, when an express service, which will not be attempted at first, will be begun. The White Plains Road extension is a three-track elevated railroad branching off from the West Farms division near 179th Street, crossing the Bronx River, extending over streets and private property along the east side of Bronx Park and thence by White Plains Road to 241st Street or Baychester Avenue near the northern city limits. The line is 14.6 track miles in length or the equivalent of 4.8 linear miles. There are eleven stations on the line. The line has cost to construct approximately $2,750,000, exclusive of the equipment which is being installed by the operating company. The contracts for the construction of the extension were let early in 1914 and the line has required approximately three years to complete.

Compensation Laws Legal

Supreme Court Holds New York and Iowa Compensation Act Constitutional

The United States Supreme Court, on March 6, held constitutional the New York workmen's compensation law in an appeal brought by the New York Central Railroad against Sarah White. Justice Pitney in handing down the decision of the court held "that the New York law cannot be held to be arbitrary and unreasonable from the standpoint of national justice; that it applies only to disabling or fatal personal injuries received in the course of hazardous employment in gainful occupation, that is, where employer and employees, by mutual consent, engage in a common occupation, where in the nature of things there is a probability that the employee must lose his life through some accidental injury, leaving his widow or children deprived of their natural support, or that he may sustain an injury not mortal, but resulting in his total or partial disablement with corresponding impairment of earning capacity, that the loss of earning power arising in such a case is a loss arising out of the business, and an expense of the operation as truly as the cost of repairing broken machinery or any other expense ordinarily paid by the employer."

The workmen's compensation statute of Iowa, which provides for an industrial commission and other elaborate machinery for compelling compensation by employers of injured workmen, was also held constitutional by the Supreme Court on March 6.

The court has also held the Washington act to be constitutional. This measure is compulsory, and contains the radical feature of refusing to permit of compensation through funds established by insurance companies or cooperative associations of employers—there is a single State fund.

Monorail Plan Offered to Chicago

A Chicago architect, Jarvis Hunt, has submitted to the Mayor a new plan of transportation for Chicago, including the use of an American monorail system which is claimed to be a "manifold improvement over the German type now in operation for more than fifteen years." The architect proposes to remove all east and west car lines from the surface in the loop district and put them into as many subways. He would leave the north and south lines on the surface. The elevated loop would be eliminated by running the north and south-bound trains into a subway at Chicago Avenue on the north and Sixteenth Street on the south. The Oak Park Elevated would be put under ground, and the Metropolitan Elevated run into a subway at Halsted Street. His plats and maps include the construction of a great many rapid transit lines, nearly all of which are to be of the monorail type. His estimate of the total cost of his "complete system of subway and rapid transit" is placed at $113,763,000, based upon the assumption that a monorail car would be used. He adds, "In case elevated railway is used instead of a monorail system, add $84,000,000 to the above estimate." Just what these figures include is not clearly set forth.

"Thirty-Twenty" Year Franchise

The local transportation committee of the City Council of Chicago, Ill., approved on March 6 a bill providing for a thirty-year franchise for the surface and elevated lines with a provision that it is to be extended twenty years in case the city does not take over the property at the end of the thirty-year period. The bill is to be recommended to the City Council, but before final action is asked, a public hearing will be held. The bill in its present form is not satisfactory to the railways, since it contains no provision for any definite per cent of amortization before the end of the thirty-year period. This is considered essential to the financing of the work. The matter is being pushed in order that it may be placed on the State legislative calendar for disposal during the present session.

Minneapolis Seeks Expert

Messrs. Maltbie, Wilcox, Bemis and Allison Suggested as Experts for the City

Milo Roy Maltbie, New York; Delos F. Wilcox, New York; Prof. E. W. Bemis, Chicago, and James E. Allison, St. Louis, are the names that have been recommended by the central franchise committee to advise the street railway committee of the Council of Minneapolis, Minn., in connection with the franchise negotiations that are pending with the Minneapolis Street Railway. Chairman Heywood, of the committee, has accordingly been instructed to correspond with the men mentioned.

The names were presented by Stiles P. Jones, executive secretary of the central franchise committee, who will collaborate with City Attorney Gould in drawing up a franchise for the consideration of the Council. Mr. Jones is reported to have said:

"This task calls for the services of one who has had thorough training in the economic phases of valuation-making, and who is familiar with appraisal methods, accounting, the practice of the state commissions, and decisions of the courts, rather than one with knowledge only of the engineering side of the subject. It is important that the man chosen be one whose record and professional associations indicate that he can approach the subject without prejudice with the sole purpose of presenting the facts with impartiality.

"The so-called 'cost of service' form of franchise which City Attorney Gould and I will prepare admits of two provisions as regards rate of fare and profits. One is predicated on a fixed fare with a division of profits between the company and the municipality. This is in force in Kansas City and Chicago. The other plan assumes a fixed rate of income to the company with the rate of fare fluctuating, dependent upon the accumulation of surplus and the actual cost of operation. Cleveland has the latter form. Both are planned to eliminate the speculative features of the old forms of franchise and to protect both the company and the city. Under the second plan, fares are reduced when the surplus exceeds the minimum fixed in the franchise, and raised when the surplus falls below this amount. Des Moines has a street railway franchise which is somewhat of a modified form of these two. Oakland, Toledo, Cincinnati, St. Louis and Philadelphia have this form of franchise under consideration at the present time."

Council Accepts Compromise

Cleveland Body Agrees to the Advance of 1 Cent a Mile in Cleveland Railway Operating Allowance

At a recent meeting the City Council of Cleveland, Ohio. accepted the compromise agreement arranged by its street railway committee and Fielder Sanders, street railway commissioner of the city, to take care of the deficits of the Cleveland Railway and increase the operating of the company allowance 1 cent per car-mile. Both Commissioner Sanders and Councilman Reynolds of the street railway committee told Council that there was no immediate danger of an increase in the rate of fare, as a reult of the arrangement made.

Mr. Sanders' report shows that the expenses of his office for 1916 were $41,863. Of this, $3,743 was paid for what he terms secret service. He said that this expenditure was made for the betterment of the railway service.

Mr. Sanders recommended the purchase of 100 all-steel cars and 100 trail cars and suggested as a means of relieving congestion that stores, factories and offices close at different hours. He said that, under trying circumstances, the company had furnished much better service than was provided in most other cities and at a rate of fare 40 per cent lower. He announced that fifty new trail cars would be ready for use on July 1.

Mr. Sanders has announced that he will ask Council to provide for the payment of $40,000 by the Cleveland Railway toward the construction of public comfort stations at the entrances to the subway approaches to the new Superior-Detroit bridge. The county will pay the remainder.

The operating report of the Cleveland Railway for January showed the operating revenue to be $831,925, while the allowances for operating and maintenance, including the $100,000 paid from the interest fund to reduce the operating deficit, amounted to $512,747. The expenses were $450,172, which indicates that the operating deficit would have been still further increased in January, had not the extra amount for allowances been received. As it was, the operating deficit was reduced $62,575.27, instead of $100,000, as was expected at first. The operating deficit balance is now $132,500. Although $10,000 was paid on the overdraft of $268.918 in January, the additional overdraft for the month permitted a credit of only $594. The surplus to go to the interest fund for the month was $2,871. The total number of passengers carried in January was 32,575,104, an increase of 12.97 per cent over the same month last year. Transfer sales yielded $72,763.

Strike Settlement Fails

Amalgamated Association Insists on Unreasonable Terms at Springfield, Mo.

The attempt to negotiate a settlement of the strike of the employees of the Springfield (Mo.) Traction Company, in effect since last fall, has failed. The effort at an amicable adjustment of the matter had its beginning in a visit made on Feb. 3 by W. D. Mahon, president of the Amalgamated Association of Street & Electric Railway Employees, to Springfield. At that time both E. N. Sanderson, president of the Federal Light & Traction Company, and J. J. Bodell. a director of the Federal Light & Traction Company, were present in the city. Several conferences were held.

Mr. Mahon's Proposal

Mr. Mahon's proposal included a demand for the discharge of all of the motormen and conductors, shop and carhouse men now in the service of the company and the reinstatement of every man who was on strike. He also demanded an increase in wages and a closed shop. These demands were made notwithstanding that the company has been operating all of its cars for several months on the regular schedule with the exception of one car on a stub line, and has had in its employ for a long time seventy-five residents of Springfield, trained in the service of the company and to whom the company had definitely promised permanent positions. In view of its pledge to these men it was obviously impossible for the company to accede to the demand for the replacement of these men. Moreover, the company was opposed to reinstating all of the men who went out on strike on account of their conduct toward passengers and patrons since the strike. As for the demand of an increase in wages the company's finances would not permit this, due largely to the strike.

Counter Proposal of the Company

As a counter proposition the company offered to take back as many men as their record showed deserved reinstatement and to permit these men to retain their membership in the union should they so desire. In addition it agreed to place on the waiting list all other men who deserved reinstatement. This offer was refused and the negotiations were broken off on Feb. 8. When officials of the company complained to Mr. Mahon in regard to the violence in which ex-employees had participated, he is said to have remarked that there were a great many things which were worse than violence, and that one of these was "subdued humanity."

The acts of violence stopped during the period of the negotiations, but on the night of the day immediately following the end of these negotiations some strikers, strike sympathizers or their agents, placed dynamite on the Nichols Street track just outside of the city limits. This dynamite was exploded by the first car out and the car was almost completely destroyed. A labor paper contended that this act had been committed by the company's own employees, and accused the men on the car of perpetrating the dynamiting, claiming they were not on the car when the explosion occurred. As a matter of fact, both the conductor and the motorman were riding on the front platform, and the conductor on the car was cut by flying glass and his head and neck had to be dressed by a physician. Since this explosion there has been no serious violence, except the attacks on cars in outlying sections.

Bill Against One-Man Cars.—Representative Charles F. Franz has introduced in the Illinois House a bill compelling street railways in cities of 10,000 population or more to provide for each car a crew consisting of a motorman and a conductor.

Toronto to Vote on Municipal Ownership.—The Board of Control of Toronto, Ont., has decided to submit the question of the city taking over the Toronto Railway to a vote on Jan. 1, at the time of the civic election. The franchise of the company has until 1921 to run.

$13,000 Loss in Carhouse Fire.—One double-truck car, valued at $7,000, was destroyed in the fire which damaged the carhouse of the Jamestown (N. Y.) Street Railway, on Feb. 25. Several other cars were damaged and the total loss is estimated at approximately $13,000, covered by insurance.

Union Traction Men Get Increase.—The Union Traction Company, Anderson, Ind., has voluntarily increased the wages of its interurban conductors and motormen by 2 cents an hour, effective on April 1. The advance affects 300 men. The present wage scale is from 22 to 32 cents an hour and will now be increased from 24 to 34 cents.

Sweeping Abolishment of Grade Crossings Urged.—A bill has been introduced in the New York State Senate, which provides for the issuing of bonds to the amount of not to exceed $25,000,000 for the purpose of eliminating the grade crossings in the State, and providing for a submission of the bill to the people to be voted upon at the general election to be held in the year 1917.

New Los Angeles Elevated Terminal Opened.—The new elevated structure of the Pacific Electric Railway back of the station at Sixth and Main streets, Los Angeles, Cal., has been placed in operation and all trains which used the surface tracks in the Los Angeles Street terminal now operate on the new elevated. The only exceptions to this rule are the newspaper trains that carry papers to the outlying sections of southern California.

Additional Authority Sought for Commission.—Additional legislation which would increase the authority of the State Railroad Commission and empower it to regulate rates, rules, services and practices of the railways of the State will be asked of the next Legislature by the Railroad Commission of Kentucky. This is the effect of statements made in the annual report of the commission to the Governor. The California law is cited as a desirable model.

West Side Project Opposed.—The New York Central Railroad's proposed west side contract has been recommitted to the committee on port and terminal facilities of the Board of Estimate of New York City after again being assailed by many critics. On March 6 representatives of the Public Service Commission for the First District conferred with the committee on port and terminal facilities with respect to the improvement, which involves an important electrification project.

Report of Hearings on Tentative Valuations.—The Presidents' Conference Committee has issued a 320-page volume giving the full report of the hearings on Jan. 29-Feb. 3, 1917, before the Interstate Commerce Commission in the matter of the tentative valuations of the Atlanta, Birmingham & Atlantic Railroad and the Texas Midland Railroad. The report, which brings out in detail the objections of the carriers to various parts of the valuation procedure may be obtained from H. C. Phillips, general secretary, Commercial Trust Building, Philadelphia, Pa.

Service of Electrical News for Dailies.—To accommodate many newspapers which have requested the Society for Electrical Development, Inc., New York, N. Y., to furnish illustrations of new inventions and electrical progress the society has decided to issue a regular news-pictorial service. The subjects covered will be of current interest and will be authoritative. A proof sheet of the first issue has already been sent to the newspapers. The society will send out similar sheets hereafter cast in half-page mats once a month. The service will be supplied free of charge to one newspaper in a city.

No Amendments to Valentine Anti-Trust Law.—Senator Hugh R. Gilmore, having learned that his proposed amendments to the Valentine anti-trust law will have an effect which he had not foreseen, has decided not to push it. This means that it will be allowed to die, since the Legislature of Ohio will adjourn very soon and there will be no time to reconstruct the bill and remove the objections. Had the bill been written in such a way as to have only the effect desired by its author, objectionable features would have been removed from the Valentine law and at the same time it would have accomplished its legitimate purpose.

Arbitration of Labor Trouble at Hamilton.—The Ohio Electric Railway, operating the Cincinnati, Dayton & Toledo Traction Company, Hamilton, Ohio, has selected Charles S. Thatcher, a member of its board of directors, as its arbitrator in the labor disagreement with the motormen and conductors on the local line at Hamilton, while the men have selected City Solicitor Harry J. Koehler, Jr., to represent them. They are to agree upon a third member within a period of five days. The final settlement, as noted in the ELECTRIC RAILWAY JOURNAL of Feb. 17, page 317, is to be subject to approval by the court having jurisdiction over the property.

Programs of Association Meetings

New England Street Railway Club

The seventeenth annual meeting and dinner of the New England Street Railway Club will be held at the Hotel Somerset, Boston, Mass., on March 22, 1917. The annual meeting will be held at 3 p. m., the reception at 6 p. m., and the dinner at 6.30 p. m. Officers will be elected, reports for the past year heard, and other routine business transacted at the annual meeting. The speakers at the dinner will be Samuel W. McCall, Governor of the Commonwealth of Massachusetts; James M. Curley, Mayor of the city of Boston; E. K. Hall, vice-president of the Electric Bond & Share Company, New York, N. Y., and Lucius E. Wilson, manager of the American City Bureau, New York. The toastmaster will be Arthur A. Ballantine, Boston.

The tickets to the dinner will be $5 each. The seats and tables will be assigned on the principle of "first come, first served." No refunds will be made on tickets unless returned to the secretary on or before March 19.

Pacific Claim Agents' Association

At the meeting of the executive committtee of the Pacific Claim Agents' Association, held in the office of B. F. Boynton, claim agent of the Portland Railway, Light & Power Company, Portland, Ore., on Feb. 19, referred to briefly in the ELECTRIC RAILWAY JOURNAL of March 3, page 406, there were present: H. K. Relf (president), claim agent of the Spokane, Portland & Seattle Railway, Portland, Ore.; Thomas G. Aston, claim agent of the Washington Water Power Company, Spokane, Wash.; F. M. Hamilton, claim agent of the Puget Sound Traction, Light & Power Company, Seattle, Wash.; A. M. Lee, claim agent of the Northern Pacific Railway, Seattle, Wash.; W. H. Moore, claim agent of the San Diego (Cal.) Electric Railway; H. G. Winsor, claim agent of the Tacoma Railway & Power Company, Tacoma, Wash.; and B. F. Boynton, claim agent of the Portland Railway, Light & Power Company, Portland, Ore.

At this meeting it was decided to hold the next convention in Portland on July 18, 19 and 20. The subjects to be discussed and papers to be written for that meeting comprise the following:

"Prevention of Grade Crossing Accidents," "Automobile Accidents in Cities and Towns, Causes and Means to Their Prevention," "Investigation and Adjustment of Claims Arising from Automobile Accidents," "The Value of Courtesy," "What Is Being Accomplished in Accident Prevention," "Some Methods of Interesting the General Public Along Safety Lines," "What Public Service Corporations Can Do to Maintain the Confidence of the Public, and the Effect on Claim Departments," "Psychology of Claim Adjustments."

It was voted to ask R. G. Dilworth, attorney, San Diego, Cal., and C. H. Winders, attorney, Seattle, Wash., to prepare a paper for the next convention, the subject of which is to be selected later.

This will be the ninth annual convention of the association, and the committee expects it to be the most interesting one that has been held by the association.

Financial and Corporate

Annual Report

Detroit United Railway

The comparative consolidated income statement of the Detroit (Mich.) United Railway and its subsidiary companies for the years ended Dec. 31, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Gross earnings from operation:				
Passenger	$15,069,980	93.9	$12,381,829	93.6
Express	907,772	5.7	800,527	6.0
Mail	11,828	0.1	12,162	0.1
Special car	47,089	0.3	41,033	0.3
Total	$16,036,669	100.0	$13,235,551	100.0
Operating expenses	11,215,802	69.9	9,331,804	70.5
Net earnings from operation	$4,820,867	30.1	$3,903,747	29.5
Other income	351,334	2.1	286,815	2.2
Gross income	$5,172,201	32.2	$4,190,562	31.7
Interest on funded and floating debts and taxes	2,291,409	14.3	2,229,801	16.9
Net income for the year before providing for depreciation or contingencies	$2,880,792	17.9	$1,960,761	14.8
Amount credited to depreciation reserve	$800,000	4.9	$750,000	5.7
Dividends paid	843,750	5.3	750,000	5.7
Total	$1,643,750	10.2	$1,500,000	11.4
Balance transferred to surplus account	$1,237,042	7.7	$460,761	3.4

During the last calendar year the Detroit United Railway system made big advances. The gross earnings from operation increased $2,801,118, or 21.1 per cent, as compared to those of the preceding year. Most of this gain came from the increase of $2,688,151, or 21.7 per cent, in passenger earnings and $107,245, or 13.4 per cent, in express earnings. Mail earnings showed a falling off.

The operating expenses rose $1,883,998, or 20.2 per cent, so that the net earnings from operation gained $917,120, or 23.5 per cent. Other income increased $64,519, or 22.5 per cent, while interest and taxes rose only $61,608, or 2.7 per cent. The net result, therefore, before providing for depreciation and dividends, was a gain of $920,031, or 46.9 per cent. After paying higher dividends and crediting a larger amount to the depreciation reserve, $1,237,042 was transferred to the surplus account as compared to $460,761 the year before.

In 1916 there was spent for additions to the property the sum of $3,762,271, of which $3,721,998 was spent on the properties in Michigan and Ohio. In this sum were such items as right of way, $126,110; other land, $323,528; paving, $249,810; shops and car houses, $418,887; passenger and combination cars, $669,049; electric equipment of cars, $233,251, and rails, fastenings and joints, $176,740. During the year the company made large expenditures for the maintenance of its tracks, rolling stock and other properties. On Jan. 1, 1916, the depreciation reserve stood credited with $3,476,427. This reserve was credited in 1916 with $19,200 charged against operating expenses and $800,000 out of income, leaving a balance on Dec. 31, 1916, of $4,295,627.

During 1916 a total of 35.52 miles of new tracks was added, making the total mileage 874.19 miles. The increase in transfer passengers was 21.75 per cent and in transfer and free passengers 20.5 per cent, while the car mileage rose 16.5 per cent. Detailed passenger and mileage statistics for the last two years follow:

	1916	1915
Revenue passengers	335,599,802	275,576,409
Transfer passengers	119,899,335	98,541,214
Employee passengers	8,670,561	8,076,135
Total passengers	464,169,698	382,193,758
Receipts per revenue passenger	$0.0450	$0.0449
Receipts per passenger	0.0325	0.0324
Car mileage	54,008,437	46,327,634
Gross earnings per car mile	$0.2970	$0.2857
Expenses per car mile	0.2077	0.2014
Net earnings per car mile	0.0893	0.0843

Hearing on Boston Elevated

Financial Condition of Boston Elevated Railway Considered by Legislative Committee

Hearings were begun on Feb. 28 at Boston, Mass., by the legislative committee on metropolitan affairs upon the report of the special commission relative to the financial situation of the Boston Elevated Railway, which was abstracted in the ELECTRIC RAILWAY JOURNAL of Feb. 10, page 250. Lieutenant-Governor Coolidge, chairman of the special commission, stated that the investigation showed that the company needed a larger income and that if there had been an opportunity to make a unit of fare of 5⅛ cents or thereabouts, the commission might have recommended it. The speaker was of the opinion that a 6-cent fare would yield more revenue than the requirements call for at present, but said that the transportation requirements of metropolitan Boston demanded the investment of more money in facilities.

Chairman George F. Swain, of the Boston Transit Commission, a member of the special commission on the Boston Elevated Railway investigation, emphasized the necessity of additional capital for furnishing the needed facilities of rapid transit in the Boston district. He stated that there was no question of stock inflation, and that the company had always enjoyed the reputation of being well managed.

At a second hearing, on March 1, Chairman Swain, of the transit commission, continued his explanation of the special commission's report on the company's financial needs. He pointed out that if the State purchased the Cambridge subway on a 4.5 per cent basis there would be a yearly saving to the company of about 2.5 per cent on the investment, which would mean that the company would by this amount be better able to give the public needed facilities. The purchase of the subway appeared distinctly in the public interest, without any reference to the present urgency of the case. If future subway rentals could be graduated, with payments increasing by steps with the growth of population and with time, the whole situation ought to become considerably easier.

COMMISSIONER EASTMAN EMPHASIZES PUBLIC NEED

Joseph B. Eastman, of the Massachusetts Public Service Commission, pointed out that a transportation company like the Boston Elevated Railway, which is serving a large and growing community needed a steady supply of capital in order adequately to serve the public. On an average the increase in patronage was 10,000,000 annually. New capital must be provided continually or the community would suffer. More than $3,000,000 had already been borrowed by the company on short-term notes. New stock and bonds could not be issued at present. The Public Service Commission could order the company to furnish additional service, but such service could not be provided without capital. Mr. Eastman explained a bill drafted by the special commission to meet the company's needs. (Appendix to Senate 344.)

Mr. Eastman regarded the purchase of the Cambridge subway as a benefit to the State which should be taken advantage of, even if the company were paying 10 per cent dividends. The scheme of having a metropolitan district take over the existing subways was abandoned on account of the unwillingness of the city of Boston to sell its present subway titles. The State was in a better position to finance the Cambridge subway than the city of Cambridge. Such a purchase would give the public the last remaining link in the subway system at cost. No burden would be placed upon the State, as the terms of the subway lease would meet all costs. If the company should continue to own this subway, the cost would be a continuing burden upon the public. No private corporation ever attempted to retire from its capitalization the cost of any such structure.

In reply to questions from Representative Lomasney, of Boston, Mr. Eastman said that he was not interested for the Elevated stockholders, but that he was asking for legislation to secure service for the public; that the community was facing a situation in which the company could not go into the market and get money. It was not a matter of charity. The desire was to secure good service for the public. The hearing was adjourned to March 9.

I. R. T. Earnings Increase

The directors of the Interborough Rapid Transit Company have declared the regular quarterly dividend of 5 per cent upon the stock of the company, a dividend of 1¼ per cent on the stock of the Subway Realty Company, and a dividend of 1½ per cent on the preferred stock of the Interborough Consolidated Corporation. In recommending the dividends President Shonts said that the earnings of the Interborough Rapid Transit Company for the three months ending March 31 (February partly and March wholly estimated) show a gross operating revenue of $10,671,000, an increase of $1,045,221 over 1916. After the payment of all expenses, taxes, interest and other fixed charges there will remain a net corporate income of $2,753,000, an increase of $210,549 over the same period last year. For the nine months ending March 31 the gross operating revenue will be $29,694,024, an increase of $3.235,210, and after all of the operating expenses and other charges are paid, except those growing out of the strike, there will remain a net corporate income of $6,973,832, an increase of $532,228.

Assessments in Wisconsin

The following is the preliminary valuation of the property of street railways in Wisconsin, and light, heat and power companies operated in connection therewith, as made by the tax commission and entered upon the assessment roll as constituting the assessment for the year 1917, subject to correction in the manner provided by law:

Name of Company	Preliminary Assessment
Ashland Light, Power & Street Railway	$575,000
Bay Shore Street Railway	16,000
Beloit Traction Company	175,000
Chicago & Milwaukee Electric Railway	200,000
Duluth Street Railway	1,100,000
Eastern Wisconsin Railway & Light Company	1,600,000
Grand Rapids Street Railroad Company	100.000
Ironwood & Bessemer Railway & Light Company	1,300,000
Janesville Traction Company	85,000
La Crosse & Onalaska Street Railway	25,000
Madison Railways (formerly Southern Wisconsin Railway)	950,000
Manitowoc & Northern Traction Company	110,000
Menominee & Marinette Light & Traction Company	300,000
Milwaukee Electric Railway & Light Company	31,250,000
Milwaukee Light, Heat & Traction Company	8,750,000
Milwaukee Northern Railway	1,650 000
Rockford & Interurban Railway	350,000
Sheboygan Railway & Electric Company	1,350,000
Waupaca Electric Light & Railway Company	90,000
Wisconsin Electric Railway	625,000
Wisconsin Gas & Electric Company	4,000,000
Wisconsin Interurban Street Railway (formerly Chicago & Wisconsin Valley Railway)	20,000
Wisconsin-Minnesota Light & Power Company	9,000,000
Wisconsin Railway, Light & Power Company	1,150,000
Wisconsin Public Service Company	2,700,000
Wisconsin Traction, Light, Heat & Power Company	2,300,000
Wisconsin Valley Electric Company (formerly Wausau Street Railroad Company and Merrill Railway & Lighting Company)	1,575,000
Total	$71,346,000

Sinking Fund in Default

E. H. Rollins & Sons, Boston, Mass., have addressed the holders of the first mortgage bonds of the Petaluma & Santa Rosa Railway, Petaluma, Cal., calling their attention to the fact that the sinking fund provisions of the trust deed are now in default to the extent of $44,100, which will be increased by $66,150 on March 1 next. The circular says:

"We believe that by waiving the sinking fund the first mortgage bondholders would in no way jeopardize the principal of their bonds because of the large margin of security over the amount of the bond issue and of net earnings over bond interest. Furthermore, we are confident that if such action should result, as we anticipate, in the discharge of the second mortgage, it would be the indirect means of greatly enhancing the value of the first mortgage bonds, and would, therefore, be decidedly to the advantage of the first mortgage bondholders.

"In the meantime we urge you not to sell your bonds at the present prices, as we feel that if the action suggested is taken by the first mortgage bondholders, the result will be a substantial increase in the selling value of their bonds."

The circular recommends that the bonds be deposited with the Mercantile Trust Company, San Francisco, Cal., under a plan which looks to the cancellation of the $250,000 of second mortgage bonds, on condition that the sinking fund payments on the first mortgage bonds be waived.

New Holding Company Formed

United National Utilities Company to Control National Properties Company and Jersey Central Traction Company

On March 1 the United National Utilities Company, a Delaware corporation, a charter for which was recently taken out, purchased the $2,500,000 of outstanding common stock of National Properties Company, and the $1,538,000 of outstanding capital common stock of the Jersey Central Traction Company and affiliated lighting companies. At the same time the common stock of the National Gas, Electric Light & Power Company, owning and controlling gas and electric light plants in ten cities, was purchased by the American Railways. The following directors have been elected for the United National Utilities Company: Van Horn Ely, Alexander C. Robinson, T. W. Wilson, E. Clarence Miller, John Gribbel, L. L. Dunham, William C. Sproul, Henry Almstedt, Charles R. Miller, Walter H. Lippincott, J. T. Lynn and George A. Huhn, Jr. The officers follow: Van Horn Ely, president; William C. Sproul, vice-president; Walter W. Perkins, secretary and treasurer; and Henry P. Carr, assistant secretary-treasurer.

The National Properties Company controls the American Railways, Philadelphia, Pa. The plan for perfecting this merger was referred to in the ELECTRIC RAILWAY JOURNAL of Feb. 10, page 268.

Decision in Scrip Case

Georgia Commission Without Power to Authorize Issuance of Scrip by the Georgia Railway & Power Company

The petition of the Georgia Railway & Power Company before the Georgia Railroad Commission for authority to issue scrip as evidence of its intent to pay accumulated dividends on its first preferred 6 per cent cumulative stock was denied on Feb. 28 by the commission on the ground that the proposed issuance of scrip is not one of the necessities under which the law permits the commission to authorize such notes, and that therefore it is without authority to approve them. Inasmuch as the dividends, amounting to $480,000, were declared by the company's board of directors in December, and were ordered to be paid $60,000 in cash and $30,000 each six months thereafter, it appears that the payments will be made as planned, but without a scrip issue in advance, unless the directors decide to anticipate payments before they are due.

The commission holds that under the law the power of the commission to approve the issuance of notes is limited, and that it can approve the issuance of notes or other evidences of debt only when necessary and for such amounts as are required for the acquisition of new property and the construction and equipment of power plants, etc., and the completion, extension or improvement of facilities or property, or for the improvement or maintenance of service, or for the discharge or refunding of obligations. The commission's position is that there is no necessity for the issuance of scrip to pay the dividends, and that therefore it is without power to authorize that issuance. The commission does not take issue with the claim of the company that a sufficient surplus has been earned to justify the declaration of the dividend, but does state that it hesitates to give its approval to a plan which would convert "corporate profits into long term corporate debts."

The first installment of the dividends already has been paid, $60,000 in cash. The commission's approval is not necessary for the actual payment of the others, and as previously stated they will be paid at the rate of $30,000 each six months, without scrip, unless the directors anticipate them and pay them even earlier than was intended.

American Cities Company, New York, N. Y.—At the annual meeting of the American Cities Company, C. K. Beekman and H. J. Prichard, both of New York, were elected to fill vacancies. No other changes were made in the directorate.

Columbus Railway, Power & Light Company, Columbus, Ohio.—The Ohio Utilities Commission has authorized the Columbus Railway, Power & Light Company to issue $508,200 Series A preferred stock at par and $1,846,000 of its extension and refunding sinking fund 5 per cent mortgage bonds at 90. The proceeds will be used in paying for improvements already made and to build new power houses, as noted in the ELECTRIC RAILWAY JOURNAL of Feb. 24, page 364.

Commonwealth Power, Railway & Light Company, Grand Rapids, Mich.—The Commonwealth Power, Railway & Light Company is reported to have purchased the property of the Stearns Lighting & Power Company, Ludington, Mich., which furnishes light and power not only in Ludington, but also in Hart, Pentwater, Scottville, Shelby, Mears, New Era and Custer. The Stearns Lighting & Power Company has $50,000 of capital stock and $100,000 of bonds outstanding.

Illinois Northern Utilities Company, Dixon, Ill.—The Illinois Northern Utilities Company has asked the Illinois Public Utilities Commission for permission to issue $166,000 of first and refunding mortgage bonds.

Los Angeles (Cal.) Railway Corporation.—The City Railway has secured permission from the California Railroad Commission to issue $303,000 of bonds to the Los Angeles Railway Corporation in payment of moneys advanced and invested in the plant of the City Railway. The City Railway was organized several years ago to finance new construction and extensions of the Los Angeles Railway Corporation, which about that time took over the property of the Los Angeles Railway, Los Angeles Traction Company, Los Angeles Interurban Railway and portions of the Los Angeles & Redondo Railway and Pacific Electric Railway. The City Railway's property is operated by the Los Angeles Railway Corporation under lease.

Orleans-Kenner Electric Railway, New Orleans, La.—F. H. Joubert, general manager of the Public Belt Railroad of New Orleans, is quoted as authority for the statement that nothing further will be done at this time looking toward the purchase of the Orleans-Kenner Electric Railway by the city with a view to making it an annex to the public belt system.

Philadelphia Company, Pittsburgh, Pa.—The banking firms of Ladenburg, Thalmann & Company, Hayden. Stone & Company, Brown Brothers & Company, Montgomery, Clothier & Tyler, and Jerome, Hill & Company have proposed to holders of the first mortgage bonds of the Philadelphia Company a sinking fund and redemption plan. The proposal calls for a sinking fund of 2 per cent a year for the first mortgage bonds, beginning on March 1, 1918, with the callable price of the bonds 107½ and interest. A similar sinking fund beginning May 1, 1918, is provided for the consolidated mortgage bonds with a callable price of 102½ and interest. Deposits of bonds in acceptance of the plan have been called for.

Richmond Light & Railroad Company, Richmond, S. I., N. Y.—The hearing on the application of the Richmond Light & Railroad Company and the Staten Island Midland Railway to the Public Service Commission for the First District of New York for permission to consolidate under the name of the Staten Island Light & Traction Company was postponed by the commission from March 5 to March 12. A brief statement of the proposed terms of the consolidation was published in the ELECTRIC RAILWAY JOURNAL for March 3, page 407.

Tri-City Railway & Light Company, Davenport, Iowa.—B. J. Denman, vice-president and general manager of the Tri-City Railway & Light Company, has announced that the capital stock of the Tri-City Railway of Illinois, the Peoples' Power Company of Moline and the Moline, Rock Island & Eastern Traction Company, three subsidiary corporations, will be increased by a total of $595,000 to cover the cost of recent improvements. The Tri-City Railway stock is to be increased by $300,000, making the total $3,300,000. The Peoples' Power Company stock is to be increased by $275,000 to $3,275,000 and the Moline, Rock Island & Eastern Traction Company stock is to be increased by $20,000 to $195,000. The new issues will all be common stock.

Underground Electric Railways, London, England.—The Underground Electric Railways has announced that its revenue will enable it to pay the full interest to Dec. 31, 1916, on its 6 per cent first cumulative income debenture stock and to pay 2 per cent, free of income tax, on its 6 per cent income bonds of 1948 for the half year ended Dec. 31, 1916, making 5 per cent free of income tax for the year 1916 with a carry forward of about £30,000. The reduction of 1 per cent in the payment on the income bonds as compared with the semi-annual rate maintained since March, 1913, is chiefly due to the increased rate of income tax and loss in exchange on coupons paid abroad. The revenue receivable by the company shows a reduction of about £27,000, while the increased income tax and loss in foreign exchange exceeds £56,000.

Dividends Declared

Brazilian Traction, Light & Power Company, Toronto, Ont., quarterly, 1½ per cent, preferred.

Brooklyn (N. Y.) Rapid Transit Company, quarterly, 1½ per cent.

Cleveland (Ohio) Railway, quarterly, 1½ per cent.

Cumberland County Power & Light Company, Portland, Me., quarterly, 1 per cent, common.

Eastern Power & Light Corporation, New York, N. Y., quarterly, 1¾ per cent, preferred.

Frankford & Southwark Passenger Railway, Philadelphia, Pa., quarterly, $4.

Ironwood & Bessemer Railway & Light Company, Ironwood, Mich., quarterly, 1¾ per cent, preferred.

Public Service Corporation of New Jersey, Newark, N. J., quarterly, 2 per cent.

Second & Third Streets Passenger Railway, Philadelphia, Pa., quarterly, $3.

United Light & Railways Company, Grand Rapids, Mich., quarterly, 1½ per cent, first preferred; quarterly, 1 per cent, common.

West Penn Traction & Water Power Company, Pittsburgh, Pa., quarterly, 1½ per cent, preferred.

Electric Railway Monthly Earnings

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

Period		Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan.,	'17	$159,792	*$116,194	$43,598	$35,760	$7,838
1 " "	'16	148,860	*101,161	47,699	36,656	11,043

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

1m., Jan.,	'17	$82,040	*$73,165	$8,875	$27,550	†‡$18,561
1 " "	'16	72,072	*67,912	4,160	22,307	†‡17,974
7 " "	'17	623,705	*499,636	124,069	193,557	†‡68,285
7 " "	'16	570,818	*468,115	102,703	129,192	†‡25,273

CONNECTICUT COMPANY, NEW HAVEN, CONN.

1m., Jan.,	'17	$786,504	*$653,109	$133,395	$100,042	‡$56,722
1 " "	'16	701,505	*480,985	220,520	98,604	‡144,637
7 " "	'17	5,857,387	*4,550,382	1,307,005	691,151	‡805,127
7 " "	'16	5,153,928	*3,455,340	1,698,588	691,340	‡1,169,228

NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.

1m., Jan.,	'17	$26,107	*$26,411	†$304	$7,987	†‡$8,259
1 " "	'16	24,106	*23,811	295	7,994	†‡7,662
7 " "	'17	215,672	*178,728	36,944	55,910	†‡18,630
7 " "	'16	234,416	*183,310	51,106	55,993	†‡4,496

NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.

1m., Jan.,	'17	$45,763	*$49,119	†$3,356	§$6,659	†‡$8,777
1 " "	'16	41,769	*44,363	†2,594	§6,548	†‡7,036
7 " "	'17	354,227	*336,144	18,083	§48,362	†‡22,930
7 " "	'16	298,905	*298,751	154	§42,549	†‡30,718

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

1m., Jan.,	'17	$465,750	*$389,114	$76,636	$119,111	†‡$14,127
1 " "	'16	428,215	*369,064	59,151	83,393	‡2,960
7 " "	'17	3,549,134	*2,593,486	955,648	840,739	‡177,393
7 " "	'16	3,184,478	*2,416,221	768,257	805,679	‡24,736

WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.

1m., Jan.,	'17	$15,342	*$19,766	†$4,424	$2,018	†‡$6,415
1 " "	'16	18,087	*22,255	4,165	1,723	†‡5,867
7 " "	'17	122,541	*134,788	†12,247	13,492	†‡25,554
7 " "	'16	151,830	*151,989	†159	11,563	†‡11,515

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*Includes taxes. †Deficit. ‡Includes non-operating income. §Excludes interest on bonds, charged income and paid by the New York, New Haven & Hartford Railroad under guarantee; also interest on notes held by the New York, New Haven & Hartford Railroad, not credited to income of that company.

Traffic and Transportation

Joint Insurance Plan in Kansas City

About $10,000 Will Be Spent on Insurance Premiums, Half of Which Will Be Paid by the Company

The Kansas City (Mo.) Railways put into effect on March 1 an insurance plan under which each employee may receive a policy at the rate of $6.60 per thousand, half of the premium to be paid by the company. The contract, which is with the Aetna Life Insurance Company, was signed Feb. 23. In the next few days practically all the employees, except those out of the city or home sick, had filed the necessary stipulations. The company will retain the employee's share of his premium out of his wages and will pay the insurance company in a lump sum, probably once a year. The check will be about $10,000.

While the taking of this insurance is not formally compulsory, it is believed that practically all the employees will take advantage of it. Henceforth every employee who joins the company automatically receives the insurance, a $500 policy.

The amounts of the policies are graded according to length of service, as follows: First year men, $500; second year men, $600; third year men, $700; fourth year men, $800; fifth year men, $900; end of fifth year, $1,000.

All employees are eligible up to sixty-five years of age. No examination is required. The policies terminate if the insured leaves the employ of the railways company. But he may secure an ordinary life policy in the Aetna by paying the rate at his age at such time. Or he may secure a premium contract on the basis of his age when he received the policy from the railway company by paying the difference between the rate of $6.60 and the insurance company's rate for such earlier age. Thirty days will be given for effecting the change.

Each employee may also take out an additional $1,000 policy without physical examination if application is made when the railway's policy is issued. The rate, however, for the additional insurance is higher for men more than thirty-four years of age. For illustration, men forty years old must pay $7.39 for the extra thousand; fifty years, $13.01; fifty-five years, $19.12; sixty years, $28.67; sixty-five years, $46.13.

The policies, in the form of a certificate to each insured, call for the payment of the principal sum on death or permanent disability.

Change from Near Side to Far Side

After Two Years' Trial with Former Stop, Southwest Missouri Changes Back—Reasons Given

At the request of the Southwest Missouri Railroad the city commission of Joplin, Mo., on Feb. 27, gave its permission to the company to change from the near-side stop to the far-side stop in that city. The change went into effect on March 4.

The order was made following representations of T. A. Harbaugh, superintendent of transportation of the company, who said that after more than two years of trying the near-side stop plan, his company favored a change to the old method, for these reasons:

First—That people approaching the crossings take it for granted that the cars will stop, and when there is no reason for a stop the danger of accident is thus increased. Actually the near-side stop has tended to increase accidents instead of diminish them.

Second—The near-side stop gives an opportunity for pedestrians and vehicles to get in the way and tends to delay traffic, and every delay discommodes passengers on the car and persons waiting for the car.

Third—A large number of people stand at about the place where the head of the car stops and the car must be held until they walk back to get on. This also tends to delay traffic, which discommodes the public, not the street car company.

Massachusetts Commission Approves Withdrawal of Fall River Tickets

In a decision issued March 5 the Massachusetts Public Service Commission approved the withdrawal of tickets sold in the city of Fall River at the rate of six for 25 cents by the Bay State Street Railway. The decision becomes effective March 15, and is an important outcome of the celebrated Bay State fare case decided last summer, as the proposed withdrawal of tickets has been fought by the city at every stage, and had the board retained this reduced rate transportation in comparison with that sold in other important cities of similar size in Massachusetts at a flat 5-cent fare, the precedent would have been serious in its possible effect upon the company's revenues. The present decision states in part:

"The decision points out that the withdrawal of the ticket concession in Fall River carries not the slightest danger that the company will be able to earn an exorbitant return; that the situation is not one to be viewed in any narrow way, and that attention cannot, with regard for the general interest, be concentrated upon a particular portion of the system alone. The commission does not believe that the comparatively small additional burden imposed by the ticket withdrawal is unfair or that it will prove disadvantageous to the city of Fall River. It will place the municipality in a position no better or no worse than that of practically all the other large cities of the state, and so far as it adds to the financial strength of the company, will to that extent bring nearer the day of improved facilities."

Steam and Electric Connections Urged

As an outcome of four cases which have recently appeared before the Maine Public Utilities Commission, it is understood that the commission will present to the Legislature which is now in session a bill authorizing the commission to require physical connection between steam and electric railroads.

The cases relate to the matter of compulsory physical connection between the tracks of steam railroads and electric railways, in which the Cumberland Light & Power Company, the Portland & Lewiston Interurban Railway, and the Lewiston, Augusta & Waterville Street Railway are involved, and the performance by the electric railways of auxiliary or carting service by means of such physical connection or by means of a transfer of freight from cars standing on the track of the steam railroad to a car standing on the track of the electric railway and the carting by the latter of the contents of such car to its destination along the line of the electric railway.

It is understood that the steam railroads do not seriously object to permitting the electric roads to render this auxiliary or carting service, but do object to consenting to anything which will enable electric roads to enter into full competition with the steam railroads in the haulage of freight, especially where by means of such physical connection it would be entirely possible for electric roads to make very long hauls through territory now served by the steam railroads and in such haul the electric railways would be using the cars belonging to the steam railroad.

Clearance of Side Streets a Factor in Traffic Relief

In discussing the present conditions of traffic congestion in New York City before the Fifth Avenue Association on Feb. 21, William McAdoo, chief city magistrate, spoke in part, as follows:

"The traffic problem is most acute on this island south of Fifty-ninth Street, from river to river, must be treated systematically, and not with special reference to some one locality if relief is to be obtained. The first thing to be done, in my judgment, is to distribute more evenly the traffic in this congested area. If you will look at the side streets all along Fifth Avenue, you will find them congested in a tangle of vehicles, most of them violating the city ordinances; great trucks backed up tail on to the curb for long periods of time in front of shops and stores; great numbers of motor vehicles parked waiting for their fares to call them up. When you divert traffic into these side streets in order to relieve the congestion on the main thoroughfares the conditions are impossible. The Police Commissioner should have sufficient number of mounted men to keep these side streets clear."

Commission Approves Reduced Service

Bay State Railway Lengthens Headways and Cuts Out Stops on Several Interurban Routes with Approval of Authorities

In an important decision issued on March 1, the Massachusetts Public Service Commission approved general reductions in service on various country and interurban lines of the Bay State Street Railway, seven petitions being before the board in this connection. The petitions all involved reductions in service which have been made or which were proposed. Four petitions were addressed to the board by the company and three by municipal authorities. The reasons advanced for the reductions were similar in all cases. The commission concluded, after studying the evidence presented, that the reductions can be made, at least in the winter months, without any overcrowding of cars, in the hours to which the reductions are applicable. This conclusion is borne out by the experience on the Gloucester-Rockport route, where the reduced service has already been put into operation.

In the recent fare case the commission found that the company needed, for the fiscal year 1914, average gross receipts of about 33 cents per car-mile to meet operating expenses, provide adequately for depreciation, pay taxes and secure a return of 6 per cent upon the amount of capital honestly and prudently invested in the railway property. In the same year the average operating expense per car-mile for the entire system was 20.13 cents, and the actual gross receipts averaged 30.11 cents per car-mile. Upon the routes under consideration the receipts in cents per car-mile were:

	1914, Cents	1915, Cents	1916, Cents
Rockland-Braintree	21.37	20.32	20.83
Lowell-Redding	22.34	22.02	23.14
Malden-Revere	22.84	21.06	20.59
Gloucester-Rockport	25.81	24.74	24.85
Dummer Academy-Ipswich Junction	17.41	18.04	17.07

The board states that there seems no escape from the conclusion that the routes in question are not to be classed as profitable, although most of them pay operating expenses, and some of them pay their fair share of fixed charges. Nor does it appear that the recent increase to a 6-cent fare which has been made upon all of these lines except the Malden-Revere, and part of the Lowell-Reading, is likely, in the immediate future at least, to disturb this conclusion. The evidence does not indicate any very substantial increases in earnings upon these lines since the fare was raised, and such increase as there has been has been offset by the advancing cost of labor and of materials. If these routes were short lines in thickly settled urban territory, where walking is an easy alternative to riding in the cars, the economy of any reduction might be open to very serious question. It appears probable that the change in these cases, however, will result in a net saving.

The reductions in service which are now under consideration are but one minor part of the program which the company is endeavoring to inaugurate all over its system, in the urban territory as well as in the country districts. Since the decision was rendered, 25 per cent of the white pole stops throughout the system have been eliminated, and the schedule speed has in several important instances been increased so that the number of car-hours operated might be reduced. This has been done on all the lines terminating at Scollay Square, Boston, as well as in Fall River, Gloucester, Chelsea and Lynn.

Toledo Company to Issue House Organ.—The safety department of the Toledo Railways & Light Company, Toledo, Ohio, as well as the executive committee of the company's section, has recommended to President Frank R. Coates that a monthly publication for the employees of the company be issued under the direction of E. R. Kelsey, advertising manager.

Indictment Sought for Overcrowding Toronto Cars.—The Mayor of Toronto, Ont., announced on Feb. 13 that he had instructed that an indictment be prepared for the forthcoming March assizes against the Toronto Railway for maintaining a common nuisance by overcrowding its cars, and if he failed to get it past the grand jury he would proceed by other methods.

Freight Traffic on Cedar Valley Road.—A unique freight load consisting of twenty-six cars loaded with Buick automobiles was recently hauled by an electric locomotive over the lines of the Waterloo, Cedar Falls & Northern Railway from Cedar Falls to Waterloo. The tonnage of the train was about 800 and one of the 60-ton, 1300-volt locomotives was used.

International Railway Would Improve Car Lighting.—In an effort to improve car lighting the International Railway, Buffalo, N. Y., is experimenting with tungsten lamps on the Niagara and Grant Street lines. Carbon lamps have always been used by the company. This was one of the suggestions received by the company during its recent advertising campaign asking for constructive criticism.

Interurban Cars Ordered to Perform City Service.—Because of the car shortage on the Buffalo (N. Y.) city lines of the International Railway, interurban cars on the Buffalo-Lockport, Buffalo-Niagara Falls and Buffalo, Depew and Lancaster divisions, have been ordered to stop and pick up and discharge city passengers. For almost two years these cars have refused to carry city passengers. Suburban patrons have complained about the new order.

City Tries to Enforce 200 New Cars for Toronto Railway.—The city of Toronto, Ont., is again making application to the Ontario Railway and Municipal Board for an order to compel the Toronto Railway to place an additional 200 cars in service. Evidence was given on behalf of the company showing the difficulty there was in obtaining material for the construction of cars, also the difficulty of obtaining labor, both for building and operating cars, and it has been attempted to refute this evidence by means of witnesses on behalf of the city.

Kansas City Railways Publishes City Guide.—The Kansas City (Mo.) Railways has published a convenient little folder instructive to the citizen and the out-of-town visitor on Kansas City, Mo., and Kansas City, Kan. These folders will be in the hands of the hotel clerks and information bureaus. The idea fits in with the movement in Kansas City to advertise the city to its own citizens. A map of the city is included, together with lists of streets, public buildings, interurban lines and interesting and spectacular points to visit.

Greater Experience Urged for Motormen of Trains. — A bill has been introduced in the New York Senate which requires all motormen operating electric multiple-unit trains, with high-speed brakes or electric or gasoline engines, to have at least one year's experience on steam or electric railroads, and to be familiar with train orders, signals and rules, before operating a passenger or freight train in the transportation service. A record of such experience is to be furnished the Public Service Commission with respect to each such employee.

Improvements Contemplated on Buffalo and Lake Erie Line.—A recommendation has been made to the Public Service Commission of New York, Second District, that improvements be made in the facilities and service of the trolley line of the Buffalo & Lake Erie Traction Company, running from Buffalo to Erie, Pa., through the villages of Hamburg, Silver Creek, the city of Dunkirk, and along the shore of Lake Erie. These recommendations will probably be acted upon soon, to the end that improved service may be had in the early spring.

Important Decision on Jitney Bonds.—The Supreme Court of the State of Washington on Feb. 26 rendered a decision holding that a bonding company, acting as a surety for a jitney owner, was separately liable for the full amount of the bond, namely, $2,500, for each and every individual injured in an accident. The court made its meaning plain that if five persons injured in one jitney accident sue and recover judgment for $2,500 each, the bonding company would have to pay a total of $12,500, were the judgment sustained for the amount awarded.

Non-Compliance with Commission Kills Jitneys.—Jitney buses operating between Rock Island and Moline, Ill., and Davenport, Iowa, must cease operation at once under the terms of the decision made in the circuit court at Rock Island on March 1. According to the decision jitneys are public utilities and as such come under the control of the Public Utilities Commission, and therefore are required to secure certificates of convenience and necessity. Failure to comply with such rulings brought about this action, putting fifty jitney buses out of operation.

Storage Battery Buses for Havana.—The Havana Electric Railway, Light & Power Company has purchased a fleet of ten storage battery buses from the J. G. Brill Company, the order being divided equally between a 16 ft. 11 in. type, seating twenty-two persons, and a 12 ft. 8⅜ in. type, with a seating capacity of twelve persons. These buses are of peculiar interest because of the choice of storage current as the motive power over the internal combustion engine so frequently used in buses of the same type. All of the buses are mounted on General Vehicle Company chassis.

Atlantic City Club Discusses Transportation Progress.—Transportation was the subject discussed at a recent meeting of the Atlantic City (N. J.) Rotary Club, at which A. J. Purinton, general manager of the Atlantic City & Shore Railroad, was chairman. C. M. Ripley, of the General Electric Company, who is touring the country lecturing on transportation, as it has been made possible through the medium of electricity, came to Atlantic City, exhibited a set of fifty lantern slides, showing the development of transportation from the primitive methods of the Indians up to the highly efficient electrification of railroads.

Would Shift Mail from Steam to Electric Road.—A suggestion has been made to the Post Office Department at Rochester, N. Y., by trustees of the Rochester Chamber of Commerce to transfer the mail which is now carried to stations between Rochester and Syracuse on the early morning train on the New York Central Railroad to a car on the Rochester, Syracuse & Eastern Electric Railway. The steam railroad mail train, the trustees were told in a report received from the postal facilities committee, has been running from one to eight hours late in recent months, and the electric route would insure quicker delivery of mail and papers in the eastern towns.

Public and Company Officials Confer at Dinner.—Negotiations are pending between Borough Council of College Hill, Pa., and the Beaver Valley Traction Company, New Brighton, Pa., regarding the operation of freight cars of the Pittsburgh, Harmony, Butler & New Castle Railway over the Beaver Valley Traction Company tracks. The good feeling that exists between the public officials and the railway is shown by the fact that the councilmen and the representatives of the company, in an effort to arrive at an amicable settlement of the question, discussed the matter at dinner with Superintendent W. H. Boyce of the Beaver Valley Company at the company's restaurant.

Cars Are More Efficient, but Blockades Reduce Speed.—In a second bulletin describing the deplorable blockading of some of the streets in New York City, the New York Railways have pointed out that all the improvements in car service made in recent years are more than offset by delays to which the company is subjected at the present time. Although the cars to-day are capable of making better speed, are designed to start and stop more quickly, are said to be more efficient and comfortable in operation; yet the net result of street congestion is that the speed of the city's traffic is slower than before, the speed in the congested zone having been reduced from 6½ m.p.h. to 6, and in some cases to 5½ m.p.h.

Length of Open-Car Season Discussed.—A hearing has been closed and decision reserved by the Public Service Commission of New York, First District, in reference to complaints made to it concerning the practices of street railway companies in placing open cars in operation early in spring and of leaving them in operation after cold weather begins. At the hearing, testimony was given by several operating officials, representing various street railways and rapid transit roads in general, to the effect that open cars are placed in operation beginning on or about April 15 in the spring, and taken out of service beginning about Labor Day. Dr. Alonzo Blauvelt of the Board of Health of New York City stated that the board would like to see open cars in operation as far as possible and whenever possible. He added that when the weather is fair open cars are much superior to closed cars, as far as the general health of the public is concerned.

Bellingham (Wash.) Jitney Ordinance Not Discriminatory.—That a city has the right to pass an ordinance regulating jitney busses and placing them under strict control of local authorities is the ruling of the Supreme Court at Olympia, Wash., affirming the Whatcom County Superior Court in a case against the city of Bellingham. The court upholds the validity and constitutionality of a Bellingham city ordinance regulating jitneys. It was contended that the ordinance violated both the Federal and State Constitutions which guarantee equal rights, immunities and privileges, and that the ordinance was discriminatory class legislation. The Supreme Court says the city has the power to classify subjects of legislation and the constitution is violated only if there has been an arbitrary or unreasonable classification. The Court also lays down the rule that the State laws are not meant to be the whole law on the subject, and cities may pass regulative laws so long as they do not conflict with the State laws.

Passenger Articulates Trip to Beat the Company.—The Superior Court of Marion County, Ind., has decided in an action brought against the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., that the company is entitled to full through fares for hauling passengers between two points, even though the combined fares from intermediate points might be less than the through fare. Prior to the operation of the interurbans on a straight 2-cents-per-mile basis, fares were computed by doubling the number of miles traveled and fixing the fare so as to make it 5 cents or a multiple of five. On cross-examination of the case in question it was shown that the plaintiff had ridden from the Terminal Station, Indianapolis, to Thirty-fourth Street for a 5-cent fare, had alighted and then boarded the car again and tendered 20 cents as his fare from Thirty-fourth Street to Stop 10 on the Northwestern Interurban line, which would have made his total fare 25 cents. The jury decided he was a through passenger and should have paid 30 cents, the through rate. This suit is a test case, and the plaintiff has filed five other suits against the company, which are now pending.

Self-Interest of Winnipeg Citizens an Argument Against Jitneys.—An appeal for a fair regulation of the jitney's competition on the grounds of public welfare is contained in a series of five artistically prepared folders recently distributed by the Winnipeg (Man.) Street Railway to about 5000 residents of Winnipeg. Introduced by such titles as, "The March of Progress and Its Effect Upon the Future," "The Value of Merchandise and Labor Is To-day Governed by Its Mobility," "These Are Essentials in the March of Progress," "A Call to Duty the Supreme Test," "Community Life," the folders supplement each other in describing the part which the railway company has played in the last twenty-three years in the arrangement and development of Winnipeg by localizing and centralizing the shopping, warehouse and residential districts to their best advantage. In the face of many restrictions and regulations, one of the folders states, the company must endeavor to influence more and more capital into the undertaking in order to finance extensions and meet current disbursements. The corporation pleads for the removal of competition by the jitney, which has been allowed for more than two years to operate in direct violation of the street railway company's franchise.

A Record of Publishing Activity

Facts in Regard to the McGraw-Hill Publishing Company, Which Will Publish This Paper, and of Those Who Organized It

BRIEF announcement was made in this paper last week of the organization of the McGraw-Hill Publishing Company, Inc., which has taken over the publishing business of this paper and ten other technical periodicals. Some facts in regard to the individuals who will direct the activities of this company may prove of interest.

The president, James H. McGraw, is known personally to many of the readers of this paper through his activities as a publisher in the electric railway field. He was born in Panama, Chautauqua County, New York, in 1860, and was graduated in 1884 from the Fredonia Normal School. After teaching school for a few years, he commenced his life as a publisher with the American Railway Publishing Company of New York, then owner of the *Street Railway Journal* and two other papers. Shortly after the dissolution of this company, in 1888, Mr. McGraw acquired the *Street Railway Journal*, later renamed the ELECTRIC RAILWAY JOURNAL. Early in his ownership of this paper, Mr. McGraw recognized that electricity was to furnish the future power for street railways and from the beginning advocated its adoption in preference to the cable, then its strong rival as a substitute for horses.

JAMES H. MCGRAW

With the growth of electric traction, other large industries sprang up for the manufacture of electrical equipment of all sorts. To the young publisher these events were significant, and in 1896 Mr. McGraw purchased *Electrical Industries*, which he renamed the *American Electrician*, and issued it as a monthly periodical devoted to electrical and mechanical engineering. Three years later he acquired the two leading electrical journals, the *Electrical World* and the *Electrical Engineer*, both of New York. These papers were consolidated into one publication, now known as the *Electrical World*, and a few years later the *American Electrician* was included in this periodical. The *Engineering Record*, then twenty-seven years old, was purchased in 1902, and soon became of national influence in the civil engineering and contracting fields. At about the same time, Mr. McGraw started in Philadelphia a publication known as *Electrochemical Industry*. Later this paper was moved to New York, and is now known as *Metallurgical and Chemical Engineering*, and is issued semi-monthly. Two recent additions to the group are *Electrical Merchandising* and *The Contractor*. The former is designed for the merchant engaged in the sale of the electrical devices, as it was felt that the electrical field had grown so greatly in extent in a technical and commercial way that the *Electrical World* could not well serve all elements of it. *The Contractor* solves a somewhat similar problem which arose in the field of the *Engineering Record*, and is a consolidation of *The Contractor* and the *Contractors' Review*, both of Chicago. This paper is published fortnightly.

As the properties of the McGraw Publishing Company developed it became evident that special housing facilities for the editorial, business and printing staffs were necessary, and an eleven-story reinforced concrete structure was erected at 239 West Thirty-ninth Street. This building has been the home of the ELECTRIC RAILWAY JOURNAL and the other McGraw publications for the last ten years.

THE HILL PUBLISHING COMPANY AND ITS FOUNDER

The history of the Hill Publishing Company, like that of the McGraw Publishing Company, Inc., is built largely around the efforts of one man, the late John A. Hill. Mr. Hill began his publishing career by the acquisition of *Locomotive Engineering*, a paper for which he had been acting as editor. Soon after he sold that paper and purchased the *American Machinist*. Later, *Power* was added. In 1905 the *Engineering and Mining Journal* was acquired, and in 1908 the *Engineer*, of Chicago, was consolidated with *Power*, and the latter paper was made a weekly. In 1911 *Engineering News* became a Hill paper, and in the same year *Coal Age* was started, its field being coal mining and coke manufacture. The need for special quarters was also felt by Mr. Hill, and in 1914 he completed a large building at the corner of Tenth Avenue and Thirty-sixth Street, New York, where the papers are edited and printed.

After Mr. Hill's death, Arthur J. Baldwin was elected to the presidency of the Hill Publishing Company. Mr. Baldwin, who has just been elected vice-president of the McGraw-Hill Publishing Company, Inc., is a lawyer by profession, and for many years was closely associated with Mr. Hill. For ten years, before becoming the administrative head of the Hill Publishing Company, Mr. Baldwin's attention had been directed almost entirely to business problems. Among the offices he held were those of treasurer of the Rogers Silver Plate Company, treasurer of the Borough Development Company, which had a contract to remove ashes from Brooklyn; treasurer of the Boston Development & Sanitary Company, which handled all the garbage and ashes for the city of Boston; vice-president of the Automatic Fire Protection Company, and secretary of the Mississippi Wire Glass Company. For many years Mr. Baldwin had been Mr. Hill's business adviser and confidant, and this enabled him to enter upon his work as president of the Hill organization with a thorough grasp of all its details and policies.

Savings Association in Kansas City

Plans for a building savings and loan association have been completed by the Kansas City (Mo.) Railways. The overhead expenses will be borne by the company, while the employees will be the directors and all executive and official work in the organization will be directed by them. Membership in this association is limited to the 4000 employees of the railways company and their families.

The association is to be incorporated at $1,000,000, apportioned into 5000 shares at $200 each. The main purposes of the association are, first, to assist members in buying real estate; second, making improvements on real estate; third, in removing encumbrances on real estate, and, fourth, the accumulation of employees' savings. The plan is an improvement over the ordinary savings bank or building and loan association in that the company stands the overhead expense and is willing to deduct the given amount from the employee's pay check if so desired.

To become a member of the association it is necessary for the employee to buy one or more shares of stock. There are two kinds of stock—full pay and installment pay. The full pay is that which is bought outright and draws 5 per cent annually, payable semi-annually. The instalment pay draws 6 per cent interest and is payable semi-annually. It may be paid on monthly instalments of $1 or more. The stockholder may borrow at any time 75 per cent of the stock value on the security of the paid-up stock.

Personal Mention

B. W. Arnold is now solicitor for the traffic department of the Illinois Traction System, and not secretary to H. E. Chubbuck as reported recently.

C. G. Newton, formerly agent of the London & Lake Erie Railway & Transportation Company, St. Thomas, Ont., has been appointed accountant at London, Ont., succeeding L. Tait.

L. T. Brown, assistant freight agent of the Auburn & Syracuse Electric Railroad, at Syracuse, N. Y., has been appointed freight agent at Auburn, succeeding John J. McCarthy.

John Phillips, who has been affiliated with the firm of Ford, Bacon & Davis, engineers, New York, has been appointed superintendent of the Gary & Interurban Railway, Gary, Ind.

Worth A. Baldwin, for ten years passenger agent for the Union Traction Company at Muncie, Ind., has resigned to become manager of collections for the Muncie Electric Light Company.

Charles Johnstone, heretofore acting manager of the Sherbrooke Railway & Power Company, Sherbrooke, Que., has been appointed comptroller, with office at 330 Coristine Building, Montreal.

W. G. Meloon, formerly general manager of the Atlantic Shore Railway, Kennebunk, Me., is to become receiver and manager of the Portsmouth, Kittery & York Street Railway, Portsmouth, N. H.

Alex Newhouse has been appointed master mechanic of the Public Utilities Company, Evansville, Ind., and not division shop foreman of the Evansville (Ind.) Railway, as stated in the ELECTRIC RAILWAY JOURNAL of Feb. 24.

Carl Alberte, for over twenty years manager of Norumbega Park, controlled by the Middlesex & Boston Street Railway, Newtonville, Mass., has resigned to accept one of several offers for his services at points in western cities.

F. A. Miller, chief engineer of the Oakland, Antioch & Eastern Railway, Oakland, Cal., recently discussed the operation of this company's block signal system at a luncheon of the Transportation Club of the Oakland Chamber of Commerce.

W. N. Voegtly has been appointed purchasing agent of the Pacific Power & Light Company, Astoria, Ore., to succeed C. H. Still. Mr. Voegtly has been with the company for six years, part of the time in the Portland office and later as general storekeeper for the company at Kennewick.

Martin N. Todd, president of the Galt, Preston & Hespeler Street Railway, and general manager of the Lake Erie & Northern Railway, Galt, Ont., who has not been in good health for some time, left Galt on Jan. 29 for the south, his intention being to go to the Isle of Pines, and to be away for two or three months.

Sir W. M. Aitken, Bart., who was elected a director, British Columbia Electric Railway, Vancouver, B. C., at the recent annual meeting of shareholders in London, England, has been created a Baron of the United Kingdom, with the title of Baron Beaverbrook of Beaverbrook, N. B., Canada, and of Cherkley, Surrey, England.

George B. Tripp has resigned as vice-president of the United Gas & Electric Engineering Corporation, New York, to become president of the Central Construction Corporation, Harrisburg, Pa. Mr. Tripp, who is president of the Pennsylvania Electric Association, has been connected with central station and utility company operation for many years.

John J. McCarthy, formerly freight agent of the Auburn & Syracuse Electric Railroad, at Auburn, N. Y., has been appointed commercial agent of the company, a newly created position, with office at Auburn. Mr. McCarthy entered the employ of this company on June 1, 1914, and one year later he was promoted to the position of freight agent at Auburn, which he has held until his recent appointment.

J. L. Ingoldsby, statistician for the United Railways & Electric Company, Baltimore, Md., is the author of an article entitled "Statistics in Electric Railway Work," which has appeared in the March issue of the *United Railways Forum.* The article shows how charted figures enable officials of all departments of a large transportation system such as his company to keep a constant finger on the pulse of the system.

F. W. Bacon, vice-president of the Kentucky Traction & Terminal Company, the Lexington Utilities Company and the City Ice Company, Lexington, Ky., on Feb. 2, was presented by the employees of these companies with a silver service as a token of their friendship and esteem, on his leaving for Philadelphia, where he will have his headquarters. Mr. Bacon will continue as vice-president and will have general supervision over the property.

W. H. Boyce, superintendent of the Beaver Valley Traction Company, New Brighton, Pa., was tendered a dinner at the Fort Pitt Hotel, Pittsburgh, on Feb. 24, by 120 of his friends, as a testimonial of his efforts in bettering the rapid transportation facilities of the towns in the Beaver valley touched by his company's system, and for the close interest he has shown in promoting the welfare of the community. Among those who spoke at the dinner were S. L. Tone, vice-president, and C. G. Rice, claim agent, of the railway company and also of the Pittsburgh Railways.

G. G. Holding, for four years secretary-treasurer of the London (Ont.) Street Railway, has resigned in order to devote his time to his private affairs. Mr. Holding formerly was identified with business interests in Toledo, Ohio, for many years. He entered the service of the Toledo Railways & Light Company fourteen years ago as pay roll clerk and was advanced until he held the position of chief clerk in the office of the auditor of the company. He resigned from that position to go into business for himself, but subsequently re-entered the service of the company.

M. M. Reid has resigned as president, director and general manager of the Ironwood & Bessemer Railway & Light Company, Ironwood, Mich. He has been with the property since July, 1908. Mr. Reid was formerly general manager of the Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa., previous to which he was general superintendent of the Dayton, Springfield & Urbana Electric Railway, Springfield, Ohio. Before that time he had been for five years master mechanic of the same company in charge of power stations and rolling stock, having been engaged to supervise the installation of the machinery and cars. Before that he was with the Southern Railway, having been master mechanic for seven years of the Norfolk Division.

Leonard Tait, heretofore secretary-treasurer of the London & Lake Erie Railway & Transportation Company, London, Ont., has been appointed secretary-treasurer of the London Street Railway. succeeding G. G. Holding. Mr. Tait began railway work in 1899 with the Michigan Central Railroad, at London. He also served with the Grand Trunk Railroad and the Canadian Pacific Railroad, and returned to the Michigan Central Railroad in February, 1905, as chief clerk to the freight and passenger agent, London. He was appointed soliciting passenger agent of the New York Central Railroad at Toronto, and in November, 1912, became accountant of the London & Lake Erie Railway & Transportation Company and later secretary-treasurer of the company.

Edward A. Maher, Jr., whose appointment as vice-president and general manager of the Third Avenue Railway, New York, to succeed his father, E. A. Maher, Sr., was briefly announced in the ELECTRIC RAILWAY JOURNAL of March 3, is a member of the New York bar and has also had an extensive experience in railway and electric lighting affairs in New York, having been for ten years, or between 1892 and 1902, president and general manager of the North River Electric Light & Power Company. He then entered the legal department of the New York City Railway and the Third Avenue Railway, with which he was connected for seven years. He became assistant general manager of the Third Avenue Railway on Dec. 1, 1913. In connection with his recent appointment the staff members of the company on March 9 presented Mr. Maher with a 6-ft. floral horseshoe at the 130th Street headquarters, and took occasion to congratulate him on his advancement with the company, while assuring him of their earnest support and co-operation.

Lewis Clark Haskell, secretary-treasurer of the Southern Power Company, who has also been appointed secretary-treasurer of the Sherbrooke Railway & Power Company, Montreal, was born in Pennsylvania, Jan. 2, 1883, and was graduated from Colgate University, in June, 1905. From 1905 to 1908 he was assistant manager of the Haskell Lumber Company, and Salmon River Railway, Fassett, Que. In 1900 Mr. Haskell was appointed secretary-treasurer and manager of the Labrador Electric Company, Murray Bay, Que., and in 1912 he became secretary-treasurer of the South Shore Power & Paper Company, Montreal. In 1913 he was appointed secretary-treasurer of the South Canada Power Company, Montreal, which company has taken over the Sherbrooke Railway & Power Company.

C. N. Wilcoxon, president for more than two years of the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind., was elected president of the Central Electric Railway Association at its annual meeting in Indianapolis, Ind. Mr. Wilcoxon was born at Muncie, Ind. The early part of his business career was spent in the construction and management of gas and water-works systems. In 1893 he accepted the position of general manager of the local street car lines at Muncie, Ind., where he remained until 1898, when he went to Decatur, Ill., as general manager of the Decatur Traction Company. During his association with this property the system was rebuilt and put on a substantial paying basis. In 1901 Mr. Wilcoxon became general superintendent in charge of the operating department of the Western Ohio Railway, Lima, Ohio, where he remained until 1905, when he became general manager of the Cleveland, Southwestern & Columbus Railway. In 1909 he resigned this position to become general manager of the Chicago, Lake Shore & South Bend Railway. Early in 1914 he was also elected a vice-president of the latter company and later in the same year became president.

C. N. WILCOXON

Obituary

Col. William Barbour, director of the North Jersey Rapid Transit Company, Hohokus, N. J., and a large number of other corporations, also former treasurer of the Republican National Committee and president of the American Protective Tariff League, died on March 1.

Col. Walter Katte, who was for fifty years active in railroad and bridge construction in this country, and who was the first chief engineer of the Second and Ninth Avenue elevated roads, died on March 4, in his eighty-eighth year. His son, E. B. Katte, is chief engineer of electric traction, New York Central Railroad.

Horace E. Teachout, financier, promoter and builder of the first electric street railway in Des Moines, Iowa, died in that city on Feb. 22. Mr. Teachout's successful organization and operation of this street railway, which was also the first electric street railway in Iowa, had its beginning in 1886. Three years later Mr. Teachout sold out his interest in the car line.

Alfred W. Parker, for many years closely identified with the inspection of steel work in connection with Boston rapid transit development, died recently at Waltham, Mass., at the age of seventy-three. Mr. Parker was a native of Providence, R. I., and his electric railway experience included a long term of service as inspecting engineer for the Boston Elevated Railway and the Boston Transit Commission, the steel work of the latter being in his charge with respect to all erection and installation at the time of his death.

Legal Notes

CHARTERS, FRANCHISES, ORDINANCES

TEXAS.—*Contract of Officers for Purchase of Real Estate and Erection of Station Construed as Personal.*

Where the officers of a traction company contracted with certain property owners, in return for a bonus, to buy lots and construct and maintain thereon the depot and terminal station buildings of the traction company, which contract was signed by the officers without designating themselves as such, it was to be construed as their personal engagement and not as that of the company. (Eastern Texas Traction Co. v. Harrison, 189 Southwestern Rep., 302.)

LIABILITY FOR NEGLIGENCE

MISSISSIPPI.—*Carrying Passenger Beyond Destination.*

In an action for carrying plaintiff beyond her destination, the language of defendant's conductor in refusing to back the car at the request of plaintiff's mother, saying, "No, you will get off right here," and also stating that he "did not have time," the testimony of the witness that he "spoke rough," amounting at the most to brusqueness, was not sufficient to constitute an insult, justifying an award of punitive damages. (Jackson Light & Traction Co. v. Taylor, 72 Southern Rep., 856.)

MISSOURI.—*Injury in Front of Carhouse.*

Where the petition alleged that deceased was driving a horse and buggy and that a street car was run out of a yard or shed from behind a brick wall, unmanned in front by any employee of the railway, and that deceased, to avoid collision with it, was compelled to turn away and upon a main line track, where his team was struck by another car and he was fatally injured, the inference was that deceased acted from apprehension of immediate danger. Hence an instruction that if defendant's negligence placed deceased in a situation of apparently imminent danger and peril, he could not be held to be negligent if in trying to escape he adopted a dangerous alternative in attempting to cross the main track, provided it was that which a prudent man might take in the same circumstances, was not repugnant to the allegations. (Huber v. United Rys. of St. Louis, 199 Southwestern Rep., 1163.)

NEW HAMPSHIRE.—*Injuries to Person from Rear Projecting Fender.*

In an action for injuries to a woman who in passing around the rear of a street car which she intended to board stumbled over the fender, evidence that the fender projected unnecessarily and that such fenders were customarily pushed in so that persons had no reason to be on guard against them, was held sufficient to show defendant's fault, though the fender did not project over the crosswalk. The company ought to have anticipated that persons coming around the rear to board the car would take the shortest route and not keep on the walk. (Guerin v. Manchester St. Ry., 99 Atlantic Rep., 298.)

WASHINGTON.—*Injury to Man Passing Through Railway Switchyard.*

Where a man was killed while walking on the tracks of a railway switchyard, which until two days before the accident had been necessarily used as a thoroughfare because a parallel street was impassable, although the use of the yard had never been forbidden, he was a naked licensee using the switchyard by sufferance, and the railway company was not responsible for his death. (Scharf v. Spokane & Inland Empire Ry., 159 Pacific Rep., 797.)

WEST VIRGINIA.—*Care of Electric Wires.*

The burden of the proper erection and maintenance of its trolley wires across a space over which telephone wires are strung and operated is on the railway company, and if a person is injured because of a cross connection, the company, to exonerate itself, must prove its adoption of approved and effective means to prevent such diversion. (Edmonds v. Monongahela Valley Traction Co., 99 Southeastern Rep., 230.)

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

FRANCHISES

Marengo, Iowa.—The Iowa Railway & Light Company has received a franchise from the City Council to erect transmission lines in Washington, Johnson and Muscatine Counties.

South Hadley Falls, Mass.—A copy of the franchise granting the Holyoke Street Railway the right to construct an extension of its Falls line to West Main, Canal, Taylor and North Main Streets has been sent to the Public Service Commission for its approval.

TRACK AND ROADWAY

Alabama Power Company, Anniston, Ala.—Announcement has been made that the Alabama Power Company will spend about $20,000 in the next three or four months in practically rebuilding its line from Anniston to Oxford Lake. The present 35-lb. rails will be replaced by 56-lb. rails and 10,000 new crossties have been ordered. A considerable amount of additional ballast will be used and new switches will be installed at crossings.

Los Angeles & San Diego Beach Railway, San Diego, Cal.—This company will reconstruct the track on its La Jolla line, substituting 60-lb. rail for the 40-lb. rail now in use.

Municipal Railways of San Francisco, San Francisco, Cal.—The public utilities committee of the Board of Supervisors has recommended that $13,702 be set aside out of the municipal street railway earnings for the purchase of copper wire for overhead construction on Market Street, between Van Ness Avenue and Church Street.

Springfield & Carbondale Railway, Chicago, Ill.—Construction will begin April 1 on this company's proposed line to connect Springfield, Pawnee, Harvel, Hillsboro, Greenville, Carlyle, Pinckneyville, DuQuoin and Carbondale. Overhead trolley will be used and 160 miles of single track will be laid. The power station will probably be located at Harvel. C. H. Forrester, 76 West Monroe Street, Chicago, president. [Jan. 27, '17.]

Illinois Traction System, Peoria, Ill.—This company will soon begin work on a realignment of the Hillsboro branch of its lines. A belt line will be constructed at Staunton, and the curves at Litchfield and Mount Olive are to be reduced in such a way as to greatly facilitate the handling of standard railway freight equipment. Construction work will be begun as soon as the weather will permit.

Peoria & Chillicothe Electric Railway, Peoria, Ill.—The various franchises of the Peoria & Chillicothe Electric Railway have been sent to the Public Utilities Commission of Illinois for its approval. Construction of the proposed line will be begun as soon as the weather permits, and it is expected that the line will be in operation by early fall. The company will construct a power plant at Rome. A bond issue of $30,000,000 is arranged in the East if the present franchises prove satisfactory. E. S. Woolner, Peoria, president. [Dec. 16, '16.]

Kankakee & Urbana Traction Company, Urbana, Ill.—Announcement has been made by this company that construction work on its proposed line between Paxton and Gilman will not be undertaken this year, as planned. Increased cost of material and labor prevent the company from securing contracts favorable to warrant construction work.

St. Joseph Valley Traction Company, Elkhart, Ind.—It is reported that an extension will be built by the St. Joseph Valley Traction Company to Montpelier, Ohio, where it will connect with the Wabash Railroad, and through freight service will be established over its entire length.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.—The new bridge over Wildcat Creek, near Lafayette, has been placed in service by this company.

United Railways & Electric Company, Baltimore, Md.—This company has awarded a contract to the Union Switch & Signal Company, Swissvale, Pa., for 18 miles of alternating-current automatic signaling on its Bay Shore-Sparrows Point line.

Springfield (Mass.) Street Railway.—Plans are being made by the Springfield Street Railway to construct an extension of its car line in the Northern Heights addition on Chestnut Avenue, Elm Street, Sherman Avenue and Olive Street.

Minneapolis (Minn.) Street Railway.—The construction of 12.8 miles of single track in the season of 1917 has been approved by the Council committee on street railway matters and extensions for recommendation to the City Council. The committee instructed the city attorney to prepare a resolution for the Council, indicating a reasonable time within which these extensions must be completed by the Minneapolis Street Railway.

***Lebanon, Mo.**—It is reported that C. F. Robertson, Edith, is interested in the construction of an electric railway from Lebanon to Edith.

International Railway, Buffalo, N. Y.—A movement has been begun in Tonawanda to urge the International Railway to build a trolley line from its proposed extension to the present river road line through the town of Tonawanda and along Fletcher Street in the city of Tonawanda connecting the company's present Niagara Falls branch. The company has the matter under advisement.

Interborough Rapid Transit Company, New York, N. Y.—Application has been made to the Public Service Commission for the First District of New York by the Interborough Rapid Transit Company for permission to issue $16,436,000 in bonds, the proceeds to be used as follows: For alterations in power plants, $2,391,000; extensions and equipment, $2,533,000; and for third-track installation and equipment, $10,444,000.

Schenectady (N. Y.) Railway.—The Federal Signal Company, Albany, has received a contract from the Schenectady Railway for the installation of block signals on its double-track line between Albany and Schenectady, 10 miles. The material for this installation will include 17 left-hand upper-quadrant Federal type 4A, 110-volt alternating-current semaphore signals, controlled by type UA, three-position track relays; Federal type impedance bonds having a continuous capacity of 500 amp. per rail, three Federal type C, alternating-current switch indicators with track control, and nine light type switch indicators controlled by a combination track circuit and time-element mechanism.

***Mandan, N. D.**—Plans are being made to construct an electric railway between Mandan and St. Anthony. Subscriptions to the amount of $60,000 have been received from farmers living between Mandan and St. Anthony. It is planned eventually to connect the Northern Pacific main line with the Chicago, Milwaukee & St. Paul Railway at Freda or Raleigh. F. C. Massingham, president of the Missouri Slope Fair Association, Mandan, is the promoter.

Northern Ohio Traction & Light Company, Akron, Ohio.—Plans have been completed by the Northern Ohio Traction & Light Company for four car-line extensions, including the West Exchange Street line from Five Points to Delia Avenue, out Delia Avenue to Madison Avenue, south in Madison Avenue to South Maple Street; Goodyear Heights line from East Market Street and Goodyear Avenue, extending through the Heights to the distributing reservoir of the Akron Water Works in Britain Road; Grant Street line from South Street south through the new Firestone Park allotment; Wooster Avenue line from the present terminal to East Avenue, thence southwest to the intersection of Manchester Road. The present tracks in West Exchange, West Market and Howard Streets will be relaid. Over 2 miles of double track will be built on the interurban line between Bedford and Cleveland.

Oklahoma (Okla.) Railway.—Work will be begun at once by this company on the construction of an extension from Thirteenth Street and Broadway to Eighteenth Street and Robinson Street through the Winnans Addition.

Peterboro (Ont.) Radial Railway.—The City Council of Peterboro is considering the construction of extensions to the street railway system.

Philadelphia & Reading Railway, Philadelphia, Pa.—It is reported that the Philadelphia & Reading Railway plans to equip its system from Pottsville to Schuylkill Haven and thence to Reading, a distance of 37 miles, for electrical operation. The cost is estimated at $750,000.

United National Utilities Company, Philadelphia, Pa.—This company, recently incorporated in Delaware, has purchased the outstanding common stock of the National Properties Company and the outstanding capital common stock of the Jersey Central Traction Company and affiliated lighting companies. The following officers have been elected: Van Horn Ely, president; William C. Sproul, vice-president; Walter W. Perkins, secretary and treasurer; and Henry P. Carr, assistant secretary-treasurer. [March 3, '17.]

Charleston Consolidated Railway & Lighting Company, Charleston, S. C.—Work has been begun by the Charleston Consolidated Railway & Lighting Company on the double-tracking of its line from the Five-Mile House to the Navy Yard, and it is expected that the line will be completed in the early spring.

Chattanooga Railway & Light Company, Chattanooga, Tenn.—A 3-mile extension to the property of the West Chattanooga Land Company is contemplated by the Chattanooga Railway & Light Company if a government armor plate plant is located there. The proposed line would be an extension of the St. Elmo or Lookout Mountain lines.

Houston (Tex.) Electric Company.—This company will double-track its line on Harrisburg Boulevard.

Hampton & Langley Field Railway, Hampton, Va.—An 1800-ft. pile trestle will be built by the Hampton & Langley Field Railway across Back River in connection with its 3-mile railway to be built from Hampton to the Langley aviation field. J. N. Shannahan, president. [Feb. 3, '17.]

Port Orchard, Wash.—At a recent meeting of the commissioners of Pierce and Kitsap counties the proposition of constructing an electric railroad from Port Orchard to Gig Harbor, including the inauguration of ferry service to Tacoma, was discussed. However, the commissioners were chary about committing themselves on the construction of the proposed line, stating that they believed the matter should be left entirely to a vote of the people. From present indications it is believed nothing further will be done in the matter, and that the proposed line will be indefinitely postponed. [Feb. 17, '17.]

Sedro Woolley, Wash.—It is reported that the Stone & Webster interests are preparing to extend their present system of interurban lines in this section to the upper valley, connecting Sedro Woolley with other towns in the Skagit Valley. Surveys are being made of the Upper Valley and it is believed construction activities will be begun during the summer.

Monongahela Valley Traction Company, Fairmont, W. Va.—The construction of a 3-mile extension of its east side branch to Pleasant Valley has been ordered by the Monongahela Valley Traction Company.

Waupaca Electric Service & Railway Company, Waupaca, Wis.—Improvements to its property, especially in the electric light and power department, are being planned by this company.

SHOPS AND BUILDINGS

Union Traction Company of Indiana, Anderson, Ind.—This company is considering the enlargement of its division shops at Muncie.

Beaver Valley Traction Company, New Brighton, Pa.—Agreements have been signed by the Beaver County Agricultural Association, the Beaver Valley Traction Company, and the Pennsylvania Railroad, providing for the relocation of the race track and buildings at Junction Park. The total cost of the contemplated improvements will be $46,000. The cost of the work will be paid by the Pennsylvania Railroad, in consideration for the relocation of the railroad tracks along the Beaver River, this change necessitating the moving of the race track. The work will be done under the direction of the Beaver Valley Traction Company, and contracts will be awarded in a few weeks.

Galveston-Houston Electric Railway, Galveston, Tex.—H. B. Sewell, superintendent of the Galveston-Houston Electric Railway, announces that the company will change the construction of the front of its passenger station in Galveston in repairing the damage done when a car split a switch and knocked out a brick pillar which supported the front of the building. A contract has been awarded to M. C. Bowden, Galveston, for taking out the brick pillar and placing heavy steel beams across the entire front of the building of sufficient weight to support the front of the structure.

POWER HOUSES AND SUBSTATIONS

Danville Street Railway & Light Company, Danville, Ill.—Contracts have been awarded by this company for the installation of a 4000-kw. condensing turbine unit. A new building for this equipment is nearly completed, and a substation will be erected to take care of the transmission lines leaving this plant.

Northern Illinois Light & Traction Company, Ottawa, Ill.—Work has been begun by the Northern Illinois Light & Traction Company on the construction of a plant with a 4000-kw. turbine generator. In connection with this plant an outdoor transformer station will also be built.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.—This company's power house at Decatur has been discontinued and current is now supplied from the main power house at Fort Wayne.

Albia Light & Railway Company, Albia, Iowa.—This company is rebuilding its entire plant at Albia.

Detroit (Mich.) United Railway.—In connection with the rehabilitation of the Detroit United Railway's power house, station B, in Detroit, the nature of which was described in the ELECTRIC RAILWAY JOURNAL for Oct. 28, 1916, page 956, contracts for the following equipment have been let: Four 600-hp. Stirling boilers and four six-retort Taylor stokers, four Diamond Power Specialty Company soot blowers, a Griffin steam jet ash conveyor, and a Custodis Chimney Construction Company stack. The contract for the building alterations was let to a local contractor, W. E. Woods.

Southern Power Company, Charlotte, N. C. — Contracts have been let by the Southern Power Company for the immediate construction of a new hydroelectric generating station at Wateree, S. C., to be completed Nov, 1, 1918. The new plant will have an ultimate capacity of 100,000 hp., and will be connected with six other hydroelectric stations upon the same stream or its tributaries, and owned by the Southern Power Company. The cost is estimated at $5,000,000.

Northern Ohio Traction & Light Company, Akron, Ohio.—New installations are being made by this company at its Gorge power house and the substation on the Northern Division, including two 20,000-kw. turbogenerators, boilers of 6000 hp. capacity, and nine 1000-kw., 60-cycle, rotary converters. Three 1000-kw. rotary converters will be installed at Canton. A new substation will be built at East Akron, and it will receive electricity from a 22,000-volt line, and will have one 1000-kw. rotary converter and two 1000-kw. distribution transformers. A high-tension switching station will be built at Kenmore, with a capacity for handling ten 22,000-volt circuits. A number of changes will also be made at some of the other substations of the company.

Lehigh Valley Transit Company, Allentown, Pa.—Extensive improvements are being made to the transmission system and distributing lines of the Lehigh Valley Transit Company over the entire system, from Philadelphia to Slatington. About $110,000 has been expended, and the proposed work is estimated at about $220,000.

Valley Railways, Lemoyne, Pa.—A new 2500-kw. turbine is being built by the General Electric Company for the Valley Railways to be installed at its Lemoyne power plant.

Wisconsin Public Service Company, Green Bay, Wis.—It is reported that the Wisconsin Securities Company, through its subsidiary, the Wisconsin Public Service Company, will construct a new plant at Manitowoc, at an estimated cost of $500,000.

Manufactures and Markets

Discussions of Industrial Conditions
A Department for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Business Announcements Trade Literature

To Combine Forces in Buying

Staffs to Meet for Discussion of Purchases Before Placing Orders

So many roads are deeply affected by the rise in prices of materials and the difficulty in obtaining supplies, that any measure of relief found by one will no doubt be considered readily by another. According to P. P. Crafts, general manager Kanawha Traction & Electric Company, "the difficulty of getting delivery of materials has made large stocks necessary in order to avoid a serious loss of business due to shortage of some article essential to continuity of railway or electric service. This company is to-day carrying an investment in stores of materials and supplies for operation and maintenance nearly 50 per cent greater than it has required under normal conditions. If market and transportation conditions become worse still further increases will be necessary."

Because of these conditions cited by Mr. Crafts, which are almost general in application, most roads are giving far more thought to buying methods than they ever before received. The buying questions are now difficult to answer and so, on Mr. Crafts' property as well as on others, "buying conferences" are now being held in advance of placing orders. This practice tends to assure the purchase of materials in correct quantities.

The staff method of handling the buying problem is no different in principle than the committee or conference method of deciding other operating problems. In organizations of average size the requirements of individual departments are better known by those in direct charge than by a very busy purchasing agent or storekeeper. Staff meetings on purchases to be made, therefore should serve to reduce the investment in idle stocks and to provide stores in ample time for use in extensions or maintenance.

Big Increase in Skylight Business

Many Large Orders Recently Placed—Export Business Important—Recent Studies and Developments Made on Skylights and Sashes

Owing to the large industrial development in the manufacturing, textile, steam and electric railway field, the business of the G. Drouvé Company, according to William V. Dee, secretary and general manager, has increased about 200 per cent over last year, and prospects are that the coming year will show an even greater increase.

The export business is commanding considerable attention owing to the size and amount of orders placed. Most of these installations are industrial, sugar mills, power developments or buildings for general business purposes; in some cases orders are coming from steam or electric railways which are building shops, substations or power houses. This develops the metric side of the situation and shows how extensively it is used in dealing with foreign buyers. This fact was also brought out during the recent National Foreign Trade Council convention held in Pittsburgh, Pa., on Jan. 24-27 in one of a set of eighteen questions considered helpful to the manufacturer.

INDUSTRIAL AND POWER DEVELOPMENTS

Extensions are under construction for the Boston Elevated Railroad, the Mahoning & Shenango Railway & Light Company, as well as for the New Bedford Gas & Electric Light Company, the Union Gas & Electric Company and the American Gas & Electric Company, for which the G. Drouvé Company is furnishing its anti-pluvius puttyless skylights and straight-push sash operators. In addition to the above the various Edison companies are making extensions in different parts of the country. The textile and industrial development throughout New England, the Central Eastern States and the South has grown steadily to keep pace with the demand for increased production. Several large orders have recently been completed on which from $15,000 to $25,000 worth of this company's material has been required. While the electric railway field demands only a portion of this company's product, there is considerable activity, but usually this is at its best during the summer and fall months of the year. Considerable work has been done for the Public Service Electric Company as well as for the Public Service Railway, and the Drouvé products are receiving a favorable share of this business, the largest installation being at the new terminal building recently completed in Newark, N. J. Several large groups of car repair shops and carhouses using this company's products have been completed by the Cleveland Electric Railway, and the Chicago Surface Lines have replaced a portion of one of its carhouses. Reports from the Pacific Coast indicate that several large installations will be made there in the spring. Last year an equipment of sash operating devices was furnished to the Havana Railway, Light & Power Company, Havana, Cuba.

PRICES FORCED UP—DELIVERIES GOOD

Regardless of the increased cost of raw materials and labor, this company's prices were not increased until Jan. 1, 1917, and then only after the immense stock of raw material which had been on hand was completely used up. These increases took into account only the exact costs of labor and raw materials. The advancing prices of glass, iron and copper are generally known and no comment need to be offered on this subject. Wages offered by munition workers in order to secure skilled men have necessarily caused increases in wages in the ordinary industrial manufacturer's establishment, but this condition is settling down and seems in a fair way to be solved. While all the skylights made by this company are of special "anti-pluvius" puttyless design, nevertheless orders are being filled promptly. This is in a measure due to the specialized organization in standard product that is turned out in our own manufacturing plant. While there have been shortages of small classes of material, the requirements have been pretty well covered and good records for deliveries will be maintained.

The past year has awakened decided interest in the question of paying attention to the important subject of cleaning skylight glass, which at the same time gives opportunity for observance of the condition of all parts of the skylight structure. In many cases, in electric railway buildings, it is absolutely essential that light be secured from overhead. When an investment is made to accomplish this object it would seem poor economy to permit the glass through which daylight must enter to become so black through dirt accumulation that instead of obtaining 100 per cent light, it should be reduced to 50 per cent and even less when cleaning at stated intervals insures full value all the time.

If a construction is used such that the skilled labor factor is eliminated, so that the ordinary mechanic in the maintenance force of a street railway company can attend to the vast skylight areas used, then the value of these daylight openings may be made a real asset to the corporation in many ways—better light, avoidance of accidents, saving in glass crackage and probable spoilage of work, and last, but not least, permanence as against possible renewal. There is a field for improvement in this direction, and it is the hope of the company that thought be given to it and much good will come thereby.

Trolley Contactor Signals Active

Eighteen-Year-Old Signals Still in Use—New Standard-Aspect System Soon Available—High Prices Affect Manufacturing Costs

The first trolley contactor controlled block signals installed by the United States Electric Signal Company on the lines of the Bay State Street Railway in 1899, are still in operation according to statements recently made by Roland F. Gammons, 2d, vice-president and treasurer of the company. These original signals, which have served to make history in electric railway signaling, were crude when viewed through the eyes of the present. At that time, if it was desired to run more than one car through a block at a time, it was customary to pull down the trolley poles on all but the last car entering the block. Thus the procession was protected against an adverse movement after the last car had entered. In October, 1908, the most important development appeared in the form of the improved registering signal. This was a notable step in advance for trolley contactor signaling work, because these signals protected following movements through a block and the various sections of the train counted themselves in and out, the last train out clearing the section. This company was one of the pioneers in the business and, therefore, these dates of 1899 and 1908 might well be set down in the history of trolley contactor signaling.

The next notable step in advance came recently with the announcement by Mr. Gammons that within the present season his company will offer for sale its new type N trolley contactor signal with standard aspects. This will be an all-light signal showing green for proceed, yellow for proceed with caution and red for stop. Inquiries and prospects for the sale of this signal are such that it will be fair to expect an active market as soon as it is offered for general use. Several large old-time customers have signified their intention of adopting this type of trolley contactor signaling as standard for their systems as soon as it is available for installation.

INQUIRIES SLOW FOR THREE YEARS

Speaking of the general market for trolley contactor signaling systems and apparatus, Mr. Gammons pointed out that inquiries during the past three years had been less frequent and not so substantial as in earlier years. The high cost of money three years ago, followed by the ravages of the jitney and now by the high prices of materials, even though money is low in cost, reduced the number of possible signal sales for this three-year period. Just now the roads seem to have stopped buying everything but essentials and devices which produce economies easily and directly.

Mr. Gammons cited the Collins non-splashing electric track switch as an example of an economy-producing device which is having a ready sale even during the period of high prices. He said that the prospects in 1917 for the sale of the track switch are very good. Within the past year sales have been made to more than twenty-five roads in the United States. The foreign business, however, is below normal.

THE STORY OF HIGH COSTS

The high cost of raw products and special material for the manufacture of block signals and track switches has affected the United States Electric Signal Company in about the same way that has been described for a number of other companies. Iron castings, for example, formerly purchased for all patterns at 4⅛ cents a pound, are now classified in accordance with the patterns and the price ranges from 6¼ to 15¾ cents a pound. Copper magnet wire, normally 20 to 22 cents a pound, is now in the neighborhood of 55 to 60 cents a pound and some kinds of flat steel used in the signal mechanism have increased from 4 cents a pound to 20 cents a pound.

In the sealing of the track switch mercury is used. Mercury is produced largely in Australia, New Zealand and Spain. The only mine in this country that is a regular producer is located in California. Because the largest sources are abroad, the submarine activities in Europe have caused rapid fluctuations in the price of mercury. This material normally sells for about 43 cents a pound and it has been necessary during the last two years to buy mercury at prices as high as $4.30 a pound.

Mr. Gammons has called attention to the fact that his company during the past year has done a great deal of development and experimental work along the line of trolley contactor controlled automatic block signals. Those railway men who have inspected the newly developed apparatus have complimented it highly and Mr. Gammons looks forward to its ready sale and to a possible broadening of the market by the use of standard aspects.

The Effects of Rising Costs

An Accessory Manufacturer's Ideas of the Controlling Factors of the Railway and Manufacturing Fields.

According to George P. Smith of the Smith-Ward Brake Company, the specialty manufacturer, like the general manufacturer, has had many difficulties to face during the past year. He said recently to a representative of this paper:

"Most of us buy some or many parts of our apparatus or mechanism. This greatly adds to our difficulties because of the obstacles in transportation which must be overcome before shipments can be made to our customers. We, like everyone else, have had to raise our selling prices about 25 per cent to cover the increased cost of labor, materials and other expenses. Many parts of our specialties have advanced 100 per cent. For instance, small malleable castings which we formerly bought for 4½ cents per pound delivered now cost 8 to 10 cents per pound, depending on size, weight, etc., f.o.b. the foundry. For certain more intricate, small malleable castings we have paid as high as 20 cents per pound. Even at these abnormal prices it has been most difficult to get reasonable deliveries. Bar steel, as everyone in the industry knows, has doubled in price since the start of the war. We have had several blessings, however, to make up for increased costs. There has been an increased demand to make quantity production possible, thereby lowering production and overhead costs to a great extent.

"The worst feature for electric railway manufacturers in rising costs and increased selling prices is the effect produced on their customers, whose only possible increase in receipts is in the number of persons carried but not from the receipts of each passenger. A few years ago the nickel received by the railways was much bigger in buying power than it is to-day. It went further in paying labor, taxes and all the one hundred and other expenses that an electric railway falls heir to. This diminishing buying power is as serious for the manufacturer, if he confines himself to this field, as to the electric railway. His ultimate destiny is bound up to that of the railway.

Packing 120-Ton Locomotives

Each Locomotive When Packed Required Eight Cars for Transporting from Factory to Docks

Heavy machinery intended for export is usually assembled at the factory and then loaded intact onto the decks of ocean liners. Electric locomotives weighing 41 tons each have been shipped in this way from New York to the Canal Zone and there are numerous other examples of loading complete locomotives onto the decks of ocean vessels. However, a more difficult problem was presented in the shipment of the 120-ton electric locomotives recently built by the General Electric Company for the Bethlehem-Chile Iron Mines Company at Tofo, Chile.

The capacities of the ship and dock cranes were insufficient for handling these locomotives, and therefore it was necessary to take the locomotives apart, classify the different pieces or groups according to size and weight, and box them in shipping cases of a size that could be handled by the ship and dock cranes. In shipping form, the parts of a single one of these locomotives filled eight freight cars. The shipments were loaded without mishap, and safely made the forty-day voyage to Cruz Grande. The heaviest single article in the shipment weighed 23 tons. It consisted of the locomotive underframe together with the roof structure and the necessary boxing.

Standardization of Catalogs

By S. R. Dunbar

Purchasing Agent Union Traction of Indiana.

I have noted with interest the article of W. L. Chandler of the Dodge Manufacturing Company which was published in the Electric Railway Journal of Feb. 24, page 372.

If any standard sizes of catalog can be agreed upon, I would be glad to join in insisting that such sizes should be furnished, although our manner of filing catalogs is such that the variation in sizes and shapes is not of particular inconvenience.

There would probably be much difficulty in standardizing on one size of catalog without causing waste of paper, which, particularly just now, costs more than space. Possibly it would be better if more than one size should be permitted. For instance, one or two sizes for pamphlets and one or two sizes for bound books might be chosen. We may get nothing by insisting too strongly on a single standard size, whereas we might accomplish something by permitting some flexibility.

Advertisers, of course, have very different ideas as to the best methods of presenting their data and some have pet ideas which cannot be changed readily. The small folders, for instance, for envelope "stuffing" lead naturally to a similar sized catalog as a matter of economy. The 6 in. x 9 in. pamphlet is quite generally used and it seems to be more convenient in a good many instances than the 8½ in. x 11 in. pamphlet. This latter size is, of course, necessary and anything larger would seem to be entirely unnecessary. Bound books could readily be made to conform to the last two mentioned sizes.

I believe that anything the Electric Railway Journal or its associated trade papers can do to bring about some progress toward standardizing sizes of advertising matter and catalogs would be greatly appreciated by a large majority of its readers.

[Editors' Note]

At the present time the standard sizes adopted by the Master Car Builders' Association are as follows: For post-card folders, 2½ in. x 5½ in. and 3½ in. x 6 in., and for pamphlets and trade catalogs, 6 in. x 9 in. and 9 in. x 12 in. These standard sizes have remained unchanged since 1895. The only change made by the Master Car Builders' Association was the adoption in 1912 of a new size of letter paper, 8 in. x 10½ in.

A Folder File for Catalogs

By F. S. Montgomery

Advertising Manager National Metal Molding Company, Pittsburgh, Pa.

I have noticed with particular interest the article in your issue of Jan. 24 on the subject of standardization of catalog sizes. We have recently adopted a folder file for catalogs and think that your readers may be interested in it. It was designed as a substitute for the loose-leaf catalogs. The latter have their advantages, but these are offset by the time required to insert new sheets. It is unreasonable to expect the trade to take this time, and unless a loose-leaf catalog is kept up to date it is worse than useless. We are, therefore, sending recent data on our different products in the form of separate bulletins, each bulletin being bound in a standard correspondence folder. This folder is properly indexed for filing, either according to materials or to the name of the manufacturer, and will fit any standard vertical letter file. The first three of a complete set of bulletins to replace our present catalog are just off the press and are being sent out to the trade in this manner.

Steam Railway Price Increases

A table prepared by M. M. Rice, second vice-president of the Frisco System, shows that 52 per cent of the supplies bought in 1916 show an increase of 119 per cent in cost over 1915. The other 48 per cent of the supplies increased in cost 60 per cent. The increase in the cost of axles, which were purchased in the same amounts both years, was 257 per cent and brake beams 86 per cent. Boiler tubes increased 201 per cent and steel wheels 107 per cent.

Government Orders Take Precedence

A number of manufacturers who supply important electric railway equipment and materials have been instructed by the government to give precedence to orders now in process of manufacture for the army and navy departments. With most companies this has not affected the progress of work through their shops. All manufacturers, of course, are acceding to the instructions and prosecuting the government work with all possible haste. This situation and the possible outcome now confront quite a number of manufacturers of railway equipment. One boiler manufacturer has been forced to write its electric railway customers that all earlier promises on delivery must now be delayed at least thirty days because of instructions from the government for the manufacturer to devote full attention to government orders only.

It is recognized that in time of war the government has the right to commandeer any manufacturing plant or any equipment that is needed for military use. This is a condition which the railways with much material now on order should recognize.

CURRENT PRICES FOR MATERIALS

Quoted Wednesday, March 8

Copper (electrolytic)	New York, 36¼ cents per pound
Rubber-covered wire (base)	New York, 40 cents per pound
No. 0000 feeder cable (bare)	New York, 37½ cents per pound
No. 0000 feeder cable (stranded)	New York, 35 cents per pound
No. 6 copper wire (insulated)	New York, 37½ cents per pound
No. 6 copper wire (bare)	New York, 37 cents per pound
Tin (straits)	New York, 54 cents per pound
Lead	New York, 9½ cents per pound
Spelter	New York, 10⅞ cents per pound
Rails, A. S. C. E., O. H.	Mill, $40 per gross ton
Rails, A. S. C. E., Bess	Mill, $38 per gross ton
Wire nails	Pittsburgh, $3.20 per 100 pounds
Steel (bars)	Pittsburgh, 3¼ cents per pound
Sheet iron (black, 24 gage)	Pittsburgh, 4.65 cents per pound
Sheet iron (galv., 24 gage)	Pittsburgh, 6.30 cents per pound
I-beams over 15 in.	Pittsburgh, 10 cents per pound
½-in. galv. extra high strength steel wire,	New York, $7.04 per 100 ft.
⅜-in. galv. high strength steel wire	New York, $3.52 per 100 ft.
⅜-in. galv. Siemens-Martin wire	New York, $2.60 per 100 ft.
5/16-in. galv. Siemens-Martin wire	New York, $2.00 per 100 ft.
Galvanized barb wire and staples	Pittsburgh, 4.05 cents per pound
Galvanized wire (ordinary)	Pittsburgh, 3.85 cents per pound
Cement (carload lots) with rebate for sacks,	New York, $2.02 per barrel
Cement (carload lots)	Chicago, $2.06 per barrel
Cement (carload lots)	Seattle, $2.60 per barrel
Sand in large lots	New York, 50 cents per ton
Linseed oil (raw, 5-bbl. lots)	New York, 94 cents per gallon
Linseed oil (boiled, 5-bbl. lots)	New York, 95 cents per gallon
White lead (100-lb. keg)	New York, 10¼ cents per pound
Turpentine (bbl. lots)	New York, 51½ cents per gallon

OLD METAL PRICES

Copper (heavy)	New York, 29½ cents per pound
Copper (light)	New York, 24½ cents per pound
Red brass	New York, 20 cents per pound
Yellow brass	New York, 18½ cents per pound
Lead	New York, 8 cents per pound
Zinc	8 cents per pound
Steel car axles	Chicago, $34 per net ton
Iron car wheels	Chicago, $18 per gross ton
Steel rail (scrap)	Chicago, $24.50 per gross ton
Steel rail (relaying)	Chicago, $34 per gross ton
Machine shop turnings	Chicago, $9.25 per net ton

ROLLING STOCK

Sioux City (Iowa) Service Company is building seven city cars in its shops.

Tri-City Railway, Davenport, Iowa, is reported to be preparing specifications for fifteen single-truck cars.

Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., is inquiring for prices on sixteen cars, part of which are for city and part for interurban service.

Illinois Traction System, Peoria, Ill., has ordered from the St. Louis Car Company fifteen double-truck city cars for Peoria.

Montreal Tramways, Montreal (Que.), Canada, is reported to be in the market for fifty cars in addition to the fifty which have been ordered recently from The J. G. Brill Company.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., is in the market for eight single-truck cars for

Logansport and for nine double-truck cars for Fort Wayne with an option for another nine cars.

Indiana Railway & Light Company, Kokomo, Ind., noted in the ELECTRIC RAILWAY JOURNAL of Feb. 3 as being in the market for two double-truck city cars, has ordered this equipment from the American Car Company.

Municipal Railway, San Francisco, Cal., has ordered from the White Company, Cleveland, Ohio, five semi-convertible, single-deck, prepayment type auto buses. The buses will cost $29,550 and delivery will be made within four months.

Peninsular Railway, San José, Cal., has ordered three new Fadgl cars. This type of car is 25 ft. long, weighs 10 tons, and is propelled by a 70-hp. gas engine. It will seat thirty-two passengers.

International Railway Company, Buffalo, N. Y., has not purchased five coaches from the Pennsylvania Railroad to be used on its Buffalo-Niagara Falls line as was incorrectly stated on page 278 of the Feb. 10 issue of this paper. The cars for the new line are being constructed by the G. C. Kuhlman Car Company, Cleveland, Ohio, as reported in the ELECTRIC RAILWAY JOURNAL of Jan. 6, 1917, and will be new cars, complete in every detail.

Interborough Rapid Transit Company, New York, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of Feb. 10, 1917, as being in the market for 477 steel subway cars, has opened the bids on the car-bodies. The Pullman Company had the lowest bid, $4500, and will probably get the order for all the car-bodies subject to the approval of the Public Service Commission. It is reported that the next lowest bid on the same combination was $5,550 and the highest bid was $5,795. It was stated that the Commonwealth Steel Company will probably receive the order for trucks. The following companies submitted bids on car bodies: American Car & Foundry Company, The J. G. Brill Company, the Pullman Company, the Jewett Car Company, the Southern Car Company, the Standard Steel Works, the Pressed Steel Car Company and the St. Louis Car Company.

TRADE NOTES

Perry Ventilator Corporation, New Bedford, Mass., has received an order to equip with ventilators the fifty new cars being built by the J. G. Brill Company for the Montreal Tramways.

Siemens Brothers Dynamo Works, Ltd., and **Siemens Brothers & Company, Ltd., London, England**, have removed their offices from Caxton House, Westminster, to Palace Place, Manchester, Kensington Court, London.

Lincoln Bonding Company, Cleveland, Ohio, announces the appointment of Holden & White, Inc., Fisher Building, Chicago, as sales agents in the states of Illinois, Iowa and Nebraska for the Lincoln rail bonding and welding apparatus and materials.

P. H. Affolter and A. E. Garland, who were formerly connected with Fairbanks-Morse & Company, have been made Pacific Coast representatives of the Moloney Electric Company, with headquarters in San Francisco.

H. W. Johns-Manville Company, New York, N. Y., announces the removal of its Louisville branch office to the corner of Fourth Avenue and Guthrie Street, Louisville, Ky. A. H. Voigt will be in charge of the office.

Federal Signal Company, New York, N. Y., announces that Mark R. Briny has accepted the position of Eastern manager and will have headquarters at the company's New York office, 52 Vanderbilt Avenue, after March 1.

Associated Manufacturers of Electrical Supplies, New York, N. Y., have made extensive plans for the annual meeting and banquet of the association which will be held at Delmonico's on March 15. Edward N. Hurley, retiring chairman of the Federal Trade Commission, will make an address at the banquet.

Miller Trolley Shoe Company, Boston, Mass., has received an order from the International Railway for 100 trolley shoes and 100 contact inserts to be used on its high-speed interurban line between Niagara Falls and Buffalo. The Chicago North Shore & Milwaukee Railway has repeated an order for sixty trolley shoes and 500 contact inserts.

A. H. Ackerman, formerly vice-president and general manager of the U. S. Light & Heat Corporation, and C. C. Bradford, formerly sales manager of the same company, announce the formation of the Bradford-Ackerman Corporation, with offices in the Forty-second Street Building, New York City, to represent manufacturers of railway and electrical supplies for domestic and export trade.

Marlin Arms Corporation, New Haven, Conn., has arranged to buy the plant and assets of the Standard Roller Bearing Company, Philadelphia, Pa., and of the Rockwell-Drake Corporation, Fairfield, Conn., the consideration being $2,270,000 in cash and 3350 shares of Marlin's common stock. This will assure the Marlin organization an active business after the war in addition to its regular business.

Union Carbide Company, Chicago, Ill., and Linde Air Products Company, New York, N. Y., have issued an offer to the Oxweld Acetylene Company to exchange on the basis of one-half a share of Carbide stock and one-third a share of the Linde stock for each share of Oxweld stock. Large stockholders of the Oxweld company have indicated their intention of making the exchange.

Permutit Company, New York, N. Y., announces that Cass L. Kennicott, for many years an expert in water softening, has become associated with this company, and will have charge of its Chicago office at 208 South La Salle Street. This company is prepared to install apparatus which will produce water of zero hardness, and also install other forms of water purification devices, including those designed and built by Mr. Kennicott.

Dayton Fare Recorder Company, Dayton, Ohio, announces that it has taken over the business of the New Haven Trolley Supply Company, the Recording Register & Fare Box Company, and the Sterling Fare Register Company. The new arrangement will enable the company to serve the trade even better than in the past owing to unexcelled facilities for the development and manufacture of fare collecting, recording and registering devices for city, suburban and interurban car operation.

Du Pont Fabrikoid Company, Wilmington, Del., has purchased the Marokene Company of Elizabeth, N. J. This company manufactures a material similar to fabrikoid which is used extensively by the automobile, carriage and upholstery industries. R. B. Heyward, formerly assistant superintendent of the Fabrikoid Company's Newburgh plant, will become superintendent of the Marokene plant at Elizabeth, N. J. All the sales transactions of the Marokene Company will be handled through the Wilmington office under the direction of J. K. Rodgers, sales manager of the Du Pont Fabrikoid Company.

ADVERTISING LITERATURE

Alpha Portland Cement Company, Easton, Pa., has issued a 100-page booklet on "Alpha Cement and How to Use It."

Western Reflector Company, Chicago, Ill., has issued a 16-page pamphlet on its silver and oval glass inverted, double and single cone reflectors.

David Lupton's Sons Company, Philadelphia, Pa., has issued its catalog No. 9 on Lupton service products which consist of projected ventilator, counterbalanced and counterweighted steel sashes.

General Electric Company, Schenectady, N. Y., has issued bulletin 46291A on its type IB-5 and 6 portable test meters for alternating-current circuits. This meter is made in two sizes, one of 10-amp. and the other of 150-amp. capacity.

Johnston Export Publishing Company, New York, N. Y., has just issued the fifth edition of the Export Trade Directory. The volume contains 536 pages and gives information of great value to every exporter.

W. S. Barstow & Company, New York, N. Y., has issued an attractive publication, "The Puzzle of Prosperity and Its Solution." Descriptions and illustrations of electric railway, power and industrial developments for which this company has been the constructing engineers are given. A number of halftones are shown of the construction work on the Oregon Electric Railway, which is one of the railways built by this company.

Electric Railway Journal

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OPTIMISM AT C. E. R. A. MEETING

A striking feature of the annual meeting of the Central Electric Railway Association at Indianapolis last week was the expression of optimism which seemed to be there present. No one can deny that there are some dark spots in the electric railway business. During the past few years many electric railways have had a hard road to travel. The evidence of this is that capital for new railway enterprises is hard to obtain, and a number of strong operators and manufacturers who grew up in the industry have gone into other fields of endeavor. Perhaps one reason why the situation is as it is is that electric railway men themselves have held out no hope for improvement and thus have encouraged others to adopt the same mental attitude. While we believe the situation could be much better, we believe it is on the road to improvement. One encouraging feature, in our opinion, is that the public in general is beginning to understand that electric railway fares are now too low. Another is that there is greater recognition by the public of the necessity of a monopoly in urban transportation matters. These two facts, taken together, mean that while the former large profits are not now to be expected, the electric railway business in financing, operating and manufacturing still offers large opportunities, and these will probably increase rather than decrease in the early future.

THE BRADY MEDAL AWARD

The third recipient of the Anthony N. Brady memorial medal, awarded for meritorious achievement in promoting safety of public and employees, is the Connecticut Company, which thus takes its place in line with the Boston Elevated Railway and the Union Traction Company of Indiana. We understand that these awards were based upon not only the excellent showing made when the accident statistics of these companies were considered, but also fitly to recognize the comprehensive and intelligent effort which had been expended to reduce accident risks. The honors this year were divided with the Pacific Electric Railway, Los Angeles, Cal., and the Interstate Public Service Company, Indianapolis, Ind., both of which also made remarkable records. In due course we plan to give our readers a summary of the safety work of these companies, so that the reasonableness of the awards may be more apparent. For the moment we congratulate the recipients upon this recognition, and call attention to the fact that it is none too early to plan for the filing of credentials in preparation for the next award. For the companies receiving the award, the prestige and opportunity for local and general publicity which it affords are well worth while. It is to be regretted that more companies do not place before the award committee the records of their safety work.

WHAT BAY STATE GAINS BY CAR REMODELING

The remodeling of 200 Bay State Street Railway cars to the modern fully-vestibuled type is in line with the general tendency throughout the country, but the use of pneumatic instead of manual control for the doors and steps is a most significant feature which calls for some comment. It is self-evident that for congested service, air operation of doors and steps should be the only thing to consider. However, when a railway with the cross-country and small town conditions of the Bay State practically standardizes on pneumatic control, there must be an expectation of certain substantial benefits, and we believe that these expectations will prove to be justified. In the first place, the comfort and safety of the passenger will be promoted. Who has not seen a vestibuled car running with doors open while the conductor was collecting fares and frigid zephyrs blew in on disgruntled riders? In the second place, it means a good deal to both conductor and motorman to be relieved of opening and closing doors hundreds of times a day. The conductor becomes a better fare collector and the motorman a keener operator. In the third place, the speedy opening and closing of doors will save an appreciable interval in the standing time of the car. When all the cars of a given route are equipped with air-operated control, this feature is sure to permit an increase in schedule speed, a decrease in number of cars required and more car-miles per platform man within the same working period. It is significant that this decision of the Bay State Street Railway has brought nothing but praise from the local press and this praise is well-deserved because it takes courage and foresight for a company in the financial position of the Bay State to blaze the way in car equipment progress.

STANDARDS NO BAR TO PROGRESS

In a paper read by A. L. Broomall last week before the Central Electric Railway Association and published elsewhere in this issue, emphasis was laid upon the inherently non-rigid nature of standards. It is an important point. The everlasting character that is frequently, and wrongly, ascribed to standard designs would, if it existed in fact, make each standard that was adopted an effective bar to progress along the line that it covered and would constitute an unanswerable argument against the principle of standardization. In practice, however, the purpose of establishing standards is not to deter original minds from trying anything new, but rather to induce non-original minds (and these constitute a majority in every large industry) to adopt a standard design that differs only slightly from the ones they have been using. Axles for use with the small wheel offer a case in point. Admittedly, these additions to the axle standards are necessary, since the development of the small wheel is of incalculable benefit to the industry. At the same time their acceptance involves additional designs that must be turned out by the manufacturers and additional pieces that must be kept in stock by the railways or recognized by their repair-shop men. Superficially, this axle may seem to be a backward step and contrary to the ideal of standardization. But as a matter of fact the introduction of the new axles has added to the manufacturers' lists of designs not one-tenth part of the number that would have been added if no standard drawing had been adopted. And it has added appreciably fewer than the number that would be involved on any particular railway a few years from now, or after three or four different officials had successively introduced their pet ideas on axle design for the company's new small-wheel cars.

USES OF TRACK MAINTENANCE DATA

Last summer the ELECTRIC RAILWAY JOURNAL gave considerable space to articles and editorial comment on the subject of units for comparing track maintenance costs. The general consensus of opinion seemed to be that no present or prospective unit will permit a close comparison of these costs on different properties or on different sections of the same property, if the purpose of that comparison is to determine the relative effectiveness of the maintenance work in the two cases. It is not our present purpose to raise again the subject of units, although we appreciate the desirability of being able to do what the existence of the ideal unit would make possible. While the ideal unit is in the making, however, much can be done in the way of collecting and studying maintenance cost data or individual properties and in rendering the results of this work available for reference.

One of the most practical and comprehensive studies of costs of maintaining track in paved streets which we have seen has been under way in Brooklyn for the past ten years under the direction of C. L. Crabbs, engineer way and structure, Brooklyn Rapid Transit System. This work has now been described by R. C. Cram, of the same department, in an article published in this issue. The general plan employed in Brooklyn was briefly touched upon in a letter from Mr. Cram printed in the ELECTRIC RAILWAY JOURNAL for Aug. 26, 1916, page 363. He now goes into detail, giving complete data on a large number of track sections aggregating, in single-track length, nearly a hundred miles. His story speaks for itself and at the same time is suggestive along a number of lines.

In a letter printed in this paper last September C. G. Keen said that "the importance of any cost keeping is the end for which the costs are kept." With respect to track maintenance this end in general appears to be twofold. In the first place it is to determine when extensive repairs and replacements are necessary and a further use is to point out the weaknesses and strong points of various parts of the track structure and of the maintenance methods employed. A fairly sure indication of the condition of a piece of track, judged from the economic standpoint, is given by the average rate of expenditure upon it for maintenance purposes. There comes a time, however, when the cost of labor and materials will be so great as to offset the interest on reconstruction cost. Accurate cost records of reasonably small sections of track are therefore essential to effective maintenance. This latter point has been illustrated in Brooklyn and elsewhere in all cases where certain changes in construction were shown to be desirable by the rising barometer of maintenance costs. Excessive lightness of rail, imperfection in drainage, inadequacy of track foundation, etc., have all been indicated on this maintenance gage.

Whether way engineers will ever succeed in finding a unit of maintenance cost which is more rational than the present one of expenditure per mile or per foot per year is doubtful, but there is no question that they are laying a more scientific foundation for this maintenance work. This foundation will not only enable them to get the best possible return per dollar expended but will make their requests for maintenance appropriations more convincing. Rule-of-thumb methods are particularly out of place in the way department. The track not only represents an enormous investment, but its condition also reacts favorably or unfavorably upon the life of rolling stock and upon the comfort of the patrons. The latter, in turn, has an important effect upon the attitude of the public toward the management.

STANDARD CLASSIFICATION FOR TRUCKS

The suggestion for a standard classification or uniform system of symbols for identifying trucks, which was outlined by S. A. Bullock some time ago, and which subsequently has been discussed by a number of correspondents, is obviously a step in the right direction. With the growth of the industry different truck builders have elaborated their designs so that, at the present time, an expert is required to distinguish between the trade designations used by any one manufacturer, let alone the incomprehensible jumble of symbols presented before the railway man who has to consider the output of every truck builder in the market. Even the truck builders themselves are by no means certain as to the features described by competitors' trade names. In consequence, Mr. Bullock's suggestion has the very definite advantage of aiming to produce clarity for all concerned and to establish a permanent opportunity for direct comparisons in both the purchase and operation of trucks —provided, of course, that there can be developed a system of symbols that really describes each design to which it is applied.

On this latter point in general there seems to be relatively little doubt. But there does seem to be some division of opinion in regard to the extent, or elaborateness, of the information that such a system of symbols should convey. In the communication of W. G. Gove that was published in our issue of March 3 there is offered a plan of using suffix letters which would definitely separate each detailed design of truck from every other design in the same general class. This plan has much to recommend it. Nevertheless, in principle, it appears to be almost diametrically opposed to the original conception of a standard nomenclature through its elaboration of detailed information.

In brief, the issue thus raised is important because it is basic in character. On the one hand, there is the originally suggested plan of classification, which provides for the establishment by symbol of only motor arrangement, wheel base and center-plate load. On the other hand, there is the possibility of using suffix letters, which, when coupled to the builder's name, would be enough to identify any truck without the use of any figures at all, but which would necessitate as many different symbols as there are truck designs, so that the plan would be, in effect, simplification of truck nomenclature rather than its standardization.

However, there seems to be no reason why a choice between the two principles cannot be made or a compromise between them established. The important thing is to get uniformity, since electric railway trucks, through lack of consideration, have been allowed to develop along the most hetrogeneous lines and their need for at least some elements of standardization is pressing. It is to be hoped that makers and users can combine to accomplish this initial step, and in this regard a pertinent point is raised by L. M. Clark in his communication that appears on another page, this being a query as to whether the manufacturers or the users should "start the ball rolling." We believe that action may best be obtained through both, and since both may be heard in the committee on equipment, under Chairman Gove's recently announced policy, this committee is undoubtedly the best place to discuss details. Of course, no formal action may be taken without the concurrence of the Engineering Association's executive and standards committees, but in view of the fact that President F. R. Phillips has in a recent communication favored the Association's consideration of the matter, discussion would seem to be in order even though the equipment committee already has in hand a really vast amount of work in its revision of existing standards.

RELIABILITY FOR OVERHEAD CONSTRUCTION

Inspection is, admittedly, a vitally important factor where the problem of maintenance is controlled largely by the record of train delays. For this reason the policy that has been recently adopted by the New York, Westchester & Boston Railway, as outlined on another page, whereby inspection of overhead lines is reduced almost to zero, comes rather as a surprise, this road priding itself especially upon its remarkable operating record and the practically perfect reliability of its service. Upon analysis, however, the great reduction in the extent of the inspections appears particularly logical, even for a road that regards the promptness of its trains as all-important, and thus is raised the question of the value, in general, of elaborate examinations of overhead constructions of the heavy catenary type.

From the tabulated list of interruptions that is given in the article in question it appears that the causes of failure, aside from those brought about by the cars, are subject to classification under four general headings exclusive of the miscellaneous and unknown defects. Of these classifications three, namely, lightning, foreign material across cables, and shorts caused by birds, are absolutely independent of inspection, being respectively acts of providence, acts of man and acts of animals. No examination, regardless of its elaboration, could possibly forestall them. The remaining cause for interruptions, or that involving grounded insulators, might conceivably be affected by inspections provided these were sufficiently thorough, but in practice the chance of this is rather slim. A majority of the insulator failures, which, it may be said, occur almost invariably on insulators subject to mechanical stress, come from the indirect effects of lightning or, more frequently, from the physical effect of heat and expansion, and in consequence these failures are hardly more susceptible to inspection than those in the first-named classifications. Even under the heading of "miscellaneous" there are few causes of interruption that could be appreciably affected by frequent inspections as opposed to periodical ones, and the conclusion is inevitable that high-grade overhead construction is just about as well off when it is left alone as it is when being given the most elaborate attention.

The improvements that have been made in the Westchester's feeder and contact system, as the outgrowth of several years experience with it under actual operating conditions, point directly toward the same end. Characteristic of this is the substitution of wood-stick strain insulators for dead-ended cables in place of the porcelain equipment that was originally installed. For the 11,000-volt lines impregnated wood has proved to be eminently desirable, and of course, under mechanical tension it is thoroughly reliable. This is primarily the quality that has warranted its introduction. Although the wood involves a certain amount of maintenance expense for an annual varnishing this cost is insignificant when it eliminates the need for the fragile porcelain which may let go at unexpected moments and shut down a section of the line.

Similarly there has been adopted a reinforcement of steel over insulators that adjoin crossings or are in position where an insulator failure might cause serious damage by burning the cable in two and letting the ends fall. The change has eliminated the disc insulators on the "pig-tail" safety strands that were originally used for this purpose, and with the reduction in the number of insulators interruptions in the power supply have naturally decreased. This, after all, is the simple ideal toward which all design of overhead construction may aim to best effect, because every insulator is a source of potential weakness.

Maintenance of Overhead on the Westchester

The New York, Westchester & Boston Railway Has Recently Adopted the Plan of Minimizing the Inspection of Its Overhead Contact System and Feeders, Reducing the Expense of Upkeep to a Rate of Approximately $9 Per Mile of Track Per Month

DURING the past year there has been under way on the New York, Westchester & Boston Railway an investigation as to the amount of attention that is really necessary for the proper maintenance of high-grade overhead construction such as is installed on that road,* and the result has been a material reduction in the time devoted to inspection. Under the new plan that has been adopted only three inspections per month are made, and the line crew is thus enabled to devote practically all of its time to the repair of defects that are reported and to routine work such as renewing oil for sectionalizing switches, adjustments of the contact wire and the like. Naturally, a very great decrease in cost of maintenance has been effected, since the original plan was to operate a work train, manned by several linemen, to make nightly inspections of the contact system. Until about four months ago, when the new plan got fully under way, the total expense for maintaining the overhead construction averaged about $29 per month per track-mile, but subsequent to this the cost has been reduced to about $9 per mile per month, apparently without sacrificing the reliability of the service, or involving delay in making repairs. It is expected that, except for extraordinary occurrences, the maintenance cost can be held at this figure indefinitely for the future. This does not include, however, intermittent expenditures of large amount such as painting the steel work on the catenary bridges which, it may be said, are about due now for repainting. It does not seem likely that general renewal of any part of the overhead construction will be necessary for many years to come. Even wear on the contact wire, which was quite rapid during the first two years of operation, has practically ceased since the under side of the wire has worn to a flat surface. The width of this flattened section has remained at about ⅛ in. for the past two years, the increase in wear being not measurable.

The above-mentioned unit cost of $29 per track-mile per month is an approximate average for the year 1916, but a steady reduction has been taking place for some time past up to December, 1916, since which date the cost has been cut by almost two-thirds. The unit cost figure has been based upon a single-track mileage of 54.41, and it includes the costs on the feeder system, although, of course, the feeder mileage is really independent of the track mileage. As a matter of fact there are approximately 181 miles of feeder in the installation.

When placed on the same unit basis the maintenance for the contact system has been about double that for the feeders, the two together amounting to roughly three-fourths of the total expense for the department. The difference between the total cost and the sum of the costs for feeders and contact system is due to

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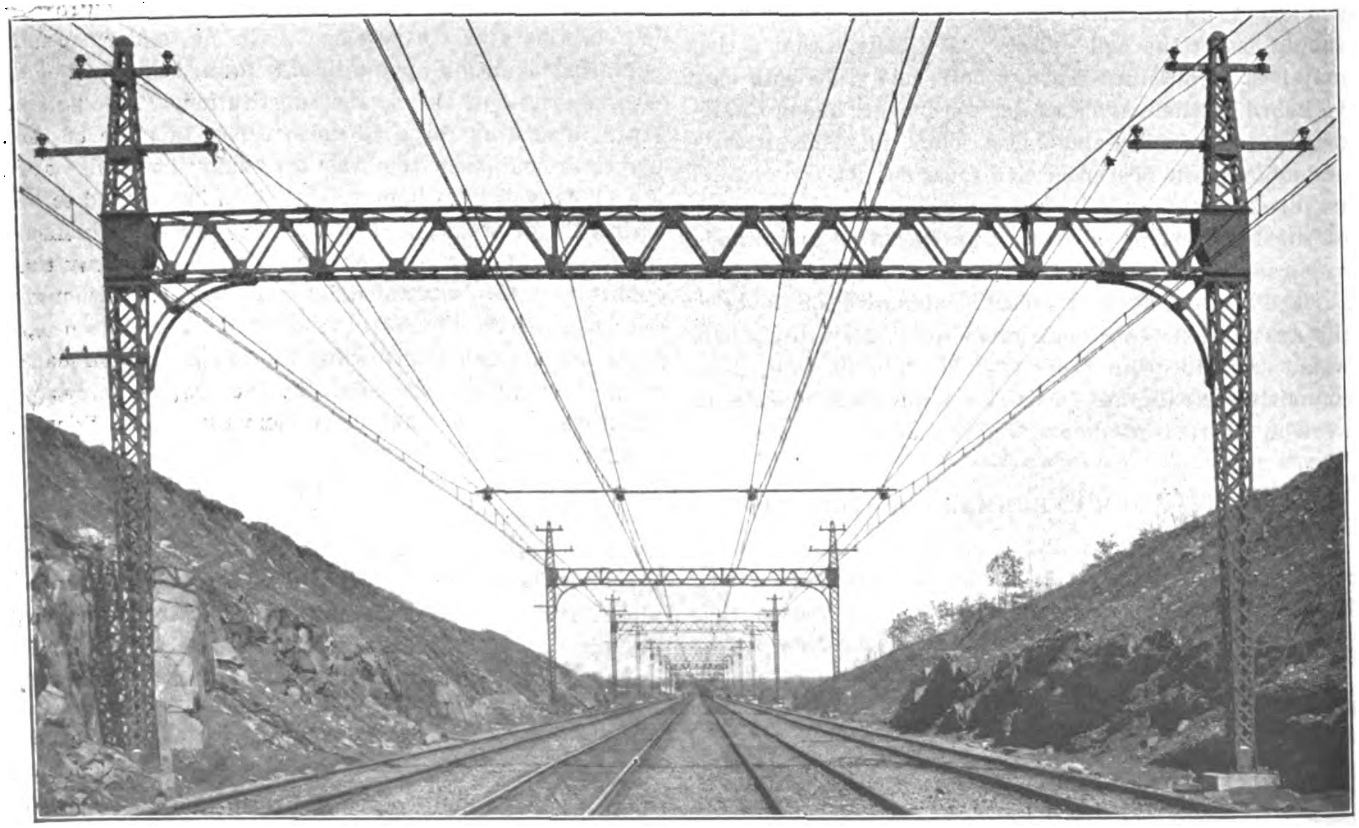
*A complete description of the overhead contact system and feeders on the New York, Westchester & Boston Railway was published in the ELECTRIC RAILWAY JOURNAL for June 15, 1912, page 1004.



WESTCHESTER LINE MAINTENANCE—COMPOUND CATENARY CONSTRUCTION ON TANGENT TRACK charges for general expense, such as repair work on the catenary bridges and on the switching equipment installed on or about them. For the latter there are involved annual inspections of oil in the transformers for the so-called 22,000-volt, three-wire arrangement* (which was introduced on the New York, Westchester & Boston Railway at the same time as on the New York, New Haven & Hartford Railroad), and examinations of the oil circuit breakers used for sectionalizing the contact wire, whenever a ground occurs to operate them.

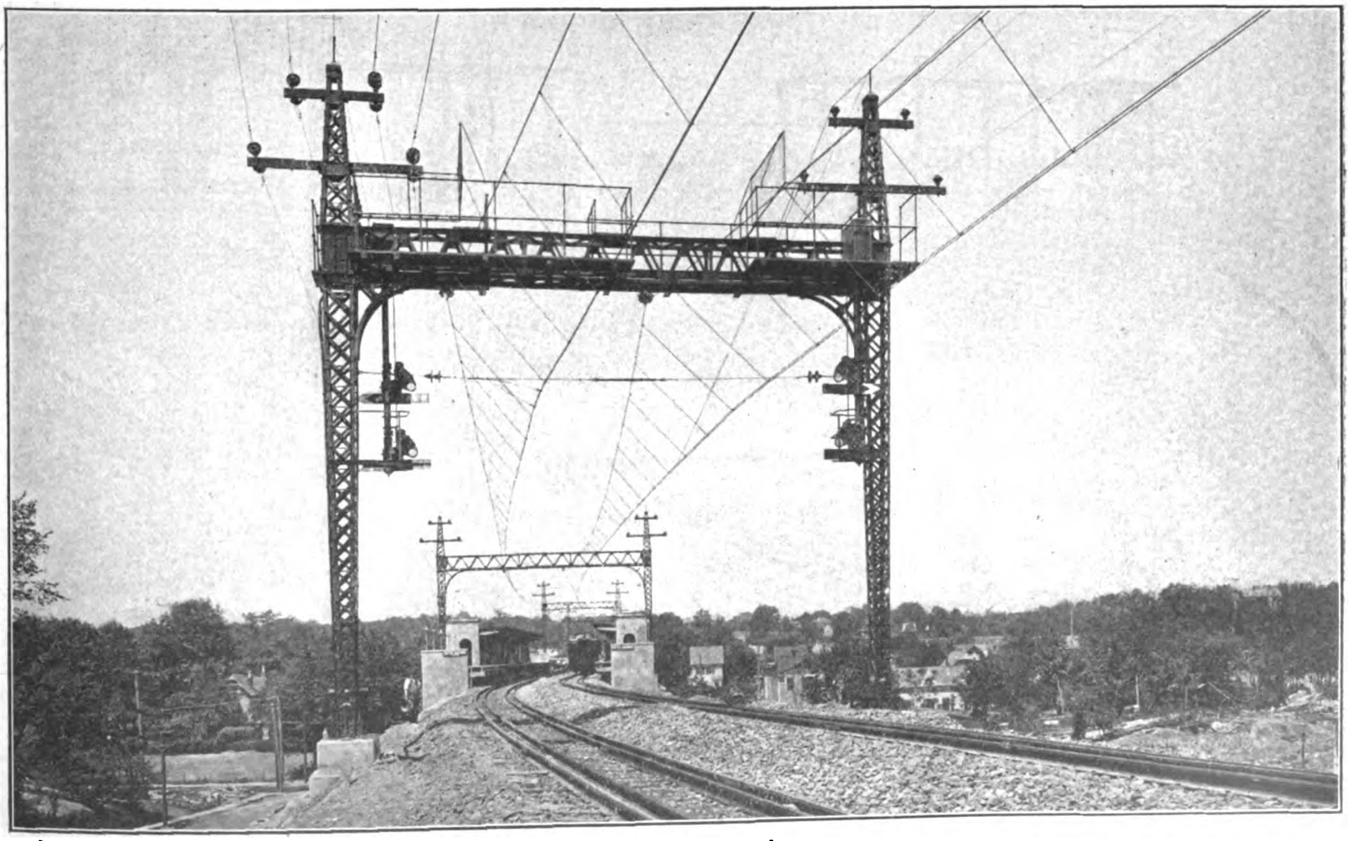
The total cost includes the wages of a train crew and the expense for fuel for the gasoline-operated line car, which is used, together with a work car, by the line crew when working on the contact system. It includes, also, the expense due to a considerable amount of new construction work carried on in 1916, which consisted largely in the installation of wood-strain insulators to reinforce the somewhat unreliable porcelain insulators that had been installed at all dead ends of contact wire. There is included also the expense due to the cumulative effect of a disastrous sleet storm which occurred late in December, 1915, and involved an unprecedented amount of repairs and replacement on the feeder system during the first half of 1916.

PRESENT METHODS OF INSPECTION AND REPAIR

In brief, it has been found that, with the overhead construction in good condition, defects do not occur from day to day, so that daily attention means a disproportion between the time spent in looking for defects and that actually devoted to their repair. This condition is emphasized by the fact that, because of traffic conditions, only about half of the time of a line crew that is engaged in inspection is effective.

Under the present arrangement an inspection is made once each month by the general foreman of the electrical department. This department, according to the organization adopted by the New York, Westchester & Boston Railway, is responsible for all power wiring and lighting for the road, and is part of the general maintenance force reporting to F. Zogbaum, engineer of maintenance. The general foreman, during his monthly inspection of the overhead construction, rides on the second car of regular train and watches the action of the contact wire and the pantograph on the car ahead, making notes when anything improper is observed. One complete trip over the whole line is made, requiring in general about three hours. The majority of defects thus discovered are in the nature of lack of adjustment of the contact wire over the center of the track or, on curves, its failure to ride centrally on the pantograph shoe. In addition, there is some tendency for the small bolts of the hanger clips to work loose, thus letting a short section of the steel contact wire hang free from the horizontal copper track-conductor wire that supports it. Occasionally, also, the Tee-iron deflectors (which are installed at frogs in the contact system to keep pantographs from catching in the diverging wires) work loose and have to be brought up to line, because if they are allowed to hang down sufficiently an opportunity is afforded for pantographs to catch in them and get torn off. It should be said here that the line is really under inspection at all times by the train crews, who report any defects that they observe in the overhead construction during their trips over the road.

In addition to the monthly inspection as outlined above a semi-monthly examination is given to the system by the foreman of the line crew. For the contact wiring, this semi-monthly inspection is made from the platform of the previously-mentioned gasoline line car and is carried out at night when power can be shut off from various sections of the line as desired. Repairs are made at this time also, and it is seldom necessary under the new arrangement to have the line and crew on the road at other times. The semi-monthly inspection



WESTCHESTER LINE MAINTENANCE—EXPERIMENTAL SECTION OF SINGLE CATENARY CONSTRUCTION

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*A description of the 22,000-volt, three-wire system for single-phase feeders was published in the ELECTRIC RAILWAY JOURNAL for May 2, 1914, page 960.

TABLE I—CAUSES OF INTERRUPTIONS OF POWER DISTRIBUTION EXCLUSIVE OF FAILURES AT SOURCE OF SUPPLY —NEW YORK, WESTCHESTER & BOSTON RAILWAY

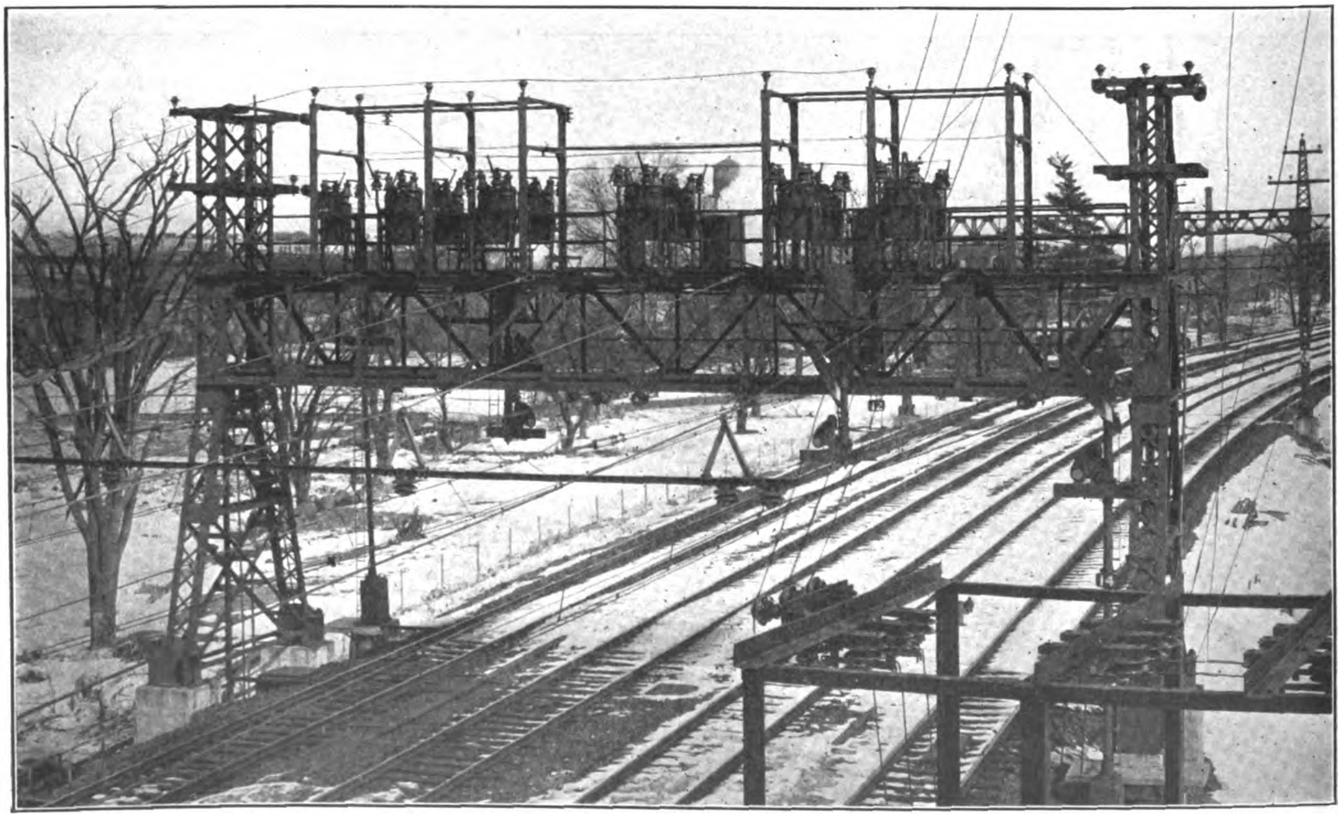
	1915										1916		1916										1917	
Cause of Interruption	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
Broken pantograph	1	2	1	1	..	..	..	..	1	2	..	..	..	..	..	..	1	1	1	..	1	..	1	2
Short or ground on car	2	..	1	2	3	1	..	..	..	5	1	4	*4	1	..	5	4	*4	5	5	4	3	1	..
Section break bridged by car	..	2	2	4	..	1	1	1	2	1	2	1	..	1	..	..	..	2	..	..	..	..	..	1
Trolley insulator grounds	1	5	..	1	6	2	*6	..	1	..	1	1	..	..	5	4	5	5	1	..	..	..	..	..
Feeder insulator grounds	1	1	1	3	3	4	1	..	..	..	2	2	..	2	1	8	5	..	..	1	..	..	..	..
Foreign material across cables	..	..	..	4	1	1	3	..	..	3	..	1	..	1	..	..	..	..	..	1	..	..	..	..
Shorts caused by birds	1	..	..	..	1	1	2	3	3	..	..	..	..	..	1	..	..	1	..	..	..	..	1	1
Cause unknown	..	1	..	1	6	3	1	2	..	..	..	..	..	1	..	..	..	..	1	3	..	..	..	..
Lightning	..	..	..	*1	..	*1	..	..	..	..	..	..	..	..	*1	..	*4	3	1	..	..	..	..	..
Miscellaneous	..	1	..	1	..	1	*1	2	..	2	..	1	..	..	..	..	..	..	2	1	2	..	1	1

*Includes series of similar interruptions on a single day, this being counted as one interruption.
†Includes shorts between car roof and pantograph that were caused by birds.
‡Of interruptions traced directly to lightning, roughly one-half affected feeders only. One-fourth of the number affected the contact system only. The remainder affected the three-phase line only and there were a few cases where all lines were affected.

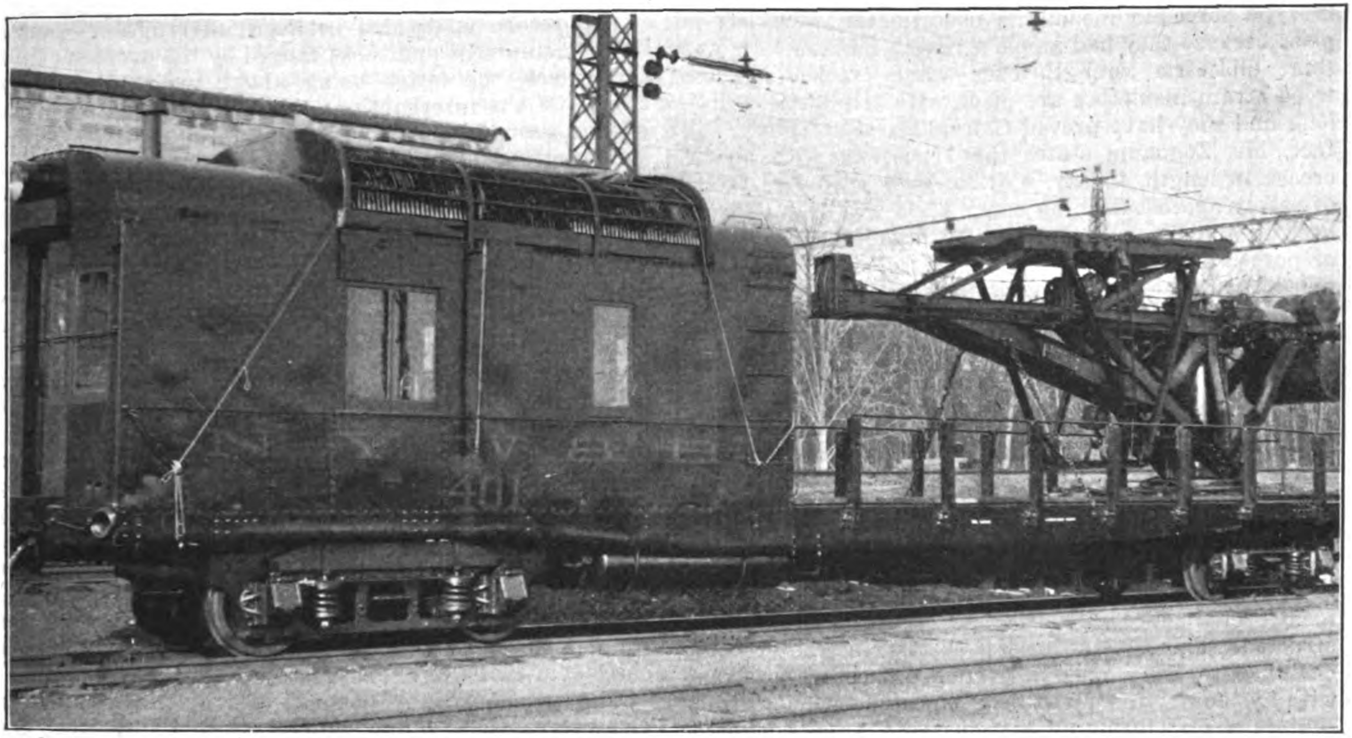
of the feeders and sectionalizing bridges is made from the ground during the daytime.

Reduction in the use of the line car for inspections of the contact wiring, it may be said here, has effected an appreciably large part of the saving in cost of overhead maintenance. Originally, the line car was frequently double-crewed, and the payroll for its operation alone approached $300 monthly. Some two years ago this was reduced to about $200 monthly by cutting out extra service, but this minimum expense could not be avoided so long as the car was in service every night. At present, the train-crew's payroll for the two or three nights that are worked during the month amounts to $15 or $20 per month. The item of fuel for the line car has of late been even greater than the train crew's wages, and the rising price of gasoline brought the total for this item of expense during last summer as high as $270 per month, resulting in the company even considering the possibility of equipping the car with a motor-generator set for operation electrically from the overhead system when power was available. By cutting down on the service, however, this expenditure has been reduced to the order of $30 per month, and the need for electric operation of the line car has probably been eliminated.

With the limitation of the number of inspections to three each month, and the opportunity of having the line crew devote practically its entire time to repair work the personnel required for overhead maintenance on the 54 track-miles of line in service has been reduced to a line foreman and three linemen. This gang works normally from 7 a. m. to 6 p. m., except two or three times per month, when it works from midnight to 11 a. m., the first part of this latter shift being devoted to inspection and repairs affecting the contact system, as it comes in the hours when traffic is light, although service on the Westchester is maintained all night. The time during daylight hours is devoted to work on the sectionalizing bridges and power feeders. Part of the line crew is, of course, subject to emergency calls at any hour. Approximately three-fourths of the time of the force is devoted to the transmission and contact system for propulsion power. The remainder is utilized in maintaining the signal transmission system, the station



WESTCHESTER LINE MAINTENANCE—ANCHOR BRIDGE WITH CIRCUIT BREAKERS FOR SECTIONALIZING CONTACT SYSTEM



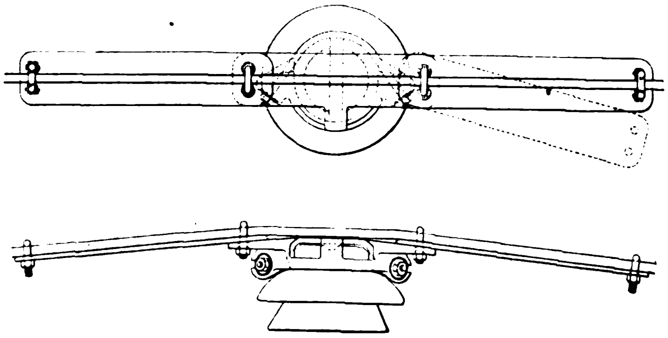
WESTCHESTER LINE MAINTENANCE—GASOLINE-DRIVEN LINE CAR USED FOR INSPECTION AND REPAIR OF CONTACT SYSTEM

lighting, the station elevators and the other electric power equipment about the road and its permanent plant.

NEW CONSTRUCTION

A considerable amount of construction work has, as mentioned in a previous paragraph, been carried on during the past year with the idea of reducing routine maintenance expense. Probably the most interesting item of this character is a new type of insulator guard that has been installed in the feeder lines at crossings or other points where the failure of an insulator and the consequent arcing and burning at the cross-arm might let the feeder fall where it would cause damage or injury to persons. The provisions originally made for this purpose consisted of short pieces of steel strand, or pig-tails, clipped to the feeder a few feet on either side of the cross-arm that was to be protected and fastened at the opposite ends to the cross-arm itself, so that if the feeder should be burnt apart at the insulator the ends of the conductor would still be held up. Each pig-tail was, of course, provided with a disc insulator between the clip at the feeder and the attachment to the grounded cross-arm.

These insulators gave a great deal of trouble through breaking down electrically, even though they were subject normally to no mechanical stress. During the past year they have been largely replaced by the device shown in the accompanying illustration. This, in brief, consists of a heavy steel reinforcement of the feeder at cross-arms where protection is desired against the cable's falling. The central section is a large carrier cap of cast iron that fits over the top of the insulator and supports the feeder. At either side of the cap is attached a supporting bar that can swing freely through a considerable arc, and to these supporting bars the feeder is clipped. If, however, the insulator fails, and even lets the conductor fall across the grounded cross-arm, the resultant arcing affects only the large body of metal of the carrier cap or supporting bars and limits the chance of its burning through before the short-circuit opens the nearest sectionalizing circuit-breakers. Since these caps have been installed the elimination of the pig-tail insulators has materially reduced the number of interruptions due to the feeder system. It is worthy of note, also, that none of the pin insulators to which the caps are applied has failed, possibly because the extended area of metal above the insulator has tended to distribute the flux from lightning discharges, which no doubt have some indirect effect, since it is found that most insulator trouble on the Westchester comes in the summer. In this connection, however, it should be said that the direct effect of lightning is not noticeable in the case of the pin insulators for the feeders and is very limited with the contact system. The use of a compound catenary with a grounded main supporting cable over the major portion of the road is undoubtedly responsible for this, no ground wire being installed on the sections of the road where the compound construction is used.



WESTCHESTER LINE MAINTENANCE—DEVICE FOR PROTECTING FEEDERS AGAINST EFFECTS OF GROUNDED INSULATOR

Another feature of recent new construction on the road has been the previously-referred-to installation of wood strain insulators in series with the barrel-type porcelain insulators that were originally used at all dead ends. The latter type of insulator has displayed a tendency to crack mechanically and to permit flashing through, and since excellent results had been obtained with impregnated wood section breaks at yard sidings, it was decided to use wood also for dead ends. The barrel-type porcelain insulators, nevertheless, were left in place because they had ample strength mechanically and some dielectric strength even when cracked. These wood strain insulators are made with triple sticks 4 ft. long and they have proved thoroughly satisfactory. In fact, Mr. Zogbaum states that (possibly with an increase in length, to say, 5 ft. to give a greater factor of safety against flashing over) wood will eventually be used on the Westchester road to the absolute exclusion of porcelain for strain insulators, although it is recognized that the routine maintenance of the wooden insulators is somewhat greater than with porcelain. Porcelain insulators, when they hold, involve absolutely no maintenance expense, whereas the wooden insulators have to be painted each year with two coats of spar varnish; otherwise the weather tends to blacken the surface of impregnated wood and this superinduces flashovers.

EXPERIENCE WITH SINGLE CATENARY

Mention should, perhaps, be made here of the experience obtained, during the past five years, with the single catenary construction that was installed as an experiment over a short section of this road when it was constructed. This type of contact system, instead of being designed to hang from a grounded messenger strand with two points of support between catenary bridges, has contact wires (including the horizontal track conductor to which the steel contact wire is clipped) supported directly with rigid hangers from a single catenary cable swinging between bridges. The spacing between hangers is 10 ft., the same as in the case of the compound catenary construction. Also the spacing between bridges is 100 yd., so that the real difference between the two designs is the elimination of the main supporting strand and cross-beams used with the compound type. The single catenary construction is thus simpler and cheaper to install than the compound catenary. A ground wire for lightning protection is installed, however, along the tops of the uprights on the catenary bridges that carry the feeders.

Experience has shown that the single catenary has no particular defects, and in general its service has been satisfactory. It has, however, cost somewhat more for maintenance than the compound catenary, mainly because of the necessity for more frequent adjustments and the greater difficulty of making the adjustments when they are needed. Unfortunately, a definite comparison between the two designs on the Westchester is impossible, for the reason that the section of the road over which the single catenary is installed is composed almost altogether of curves. Since the major difficulty with the design appears in connection with keeping the contact wire central over curved track, the expense for maintenance on this section cannot be properly compared with that which obtains over the remainder of the road, where more than two-thirds of the line is on tangents.

Based upon broad generalities, however, the opinion prevails that, if the span between catenary bridges was reduced—say from 300 ft. to 250 ft.—the single catenary type of construction would be equally reliable and somewhat less expensive to maintain than the compound catenary construction.

RECORD OF POWER INTERRUPTIONS

To give an idea of the causes of trouble that occur with the high-tension contact system that is used on the road, there is shown in the table on page 474 a record of power interruptions from all causes (except failure at the source of supply) that have occurred during the past two years. This includes every case of power off any section of the line, whether or not any trains were delayed.

The record is divided between interruptions caused by car equipment and those caused by the overhead lines themselves, the latter being about two-thirds of the total. Of the interruptions that were caused by direct shorts, grounds or other failures of the overhead construction (as distinguished from those involving the car equipment) slightly more than one-half affected the contact system only. Approximately 30 per cent affected the feeders only, and 15 per cent affected the three-phase line that is run on the same poles as the feeders. The latter class of failure does not involve loss of propulsion power, since a ground on the three-phase line does not affect feeders or contact lines unless the localizing circuit-breakers on the three-phase line should fail to operate. The interruptions that involved all lines approximated 3 per cent of the total number.

The proportion of the various causes of interruptions affecting each of the above-mentioned classes of wiring is roughly the same in all cases. In each class of wiring the grounding of insulators is productive of more failures than all other causes put together, but it should be said that, owing to the difficulty of definitely distinguishing the indirect effects of lightning, the record of grounded insulators undoubtedly includes a number of cases that really are chargeable to this cause.

The item headed "Shorts caused by birds" includes also several cases where squirrels that climbed upon the catenary bridges brought about short circuits. In one such instance a squirrel managed to ground one of the bus lines that run across the sectionalizing bridges and thus caused an interruption on an entire section of the line. However, the grounds caused by birds on pantographs are not entered under this item, since they fall more properly under the head of interruptions involving car equipment. Although this type of accident appears to require a rather extraordinary combination of circumstances, including a bird of sufficient size that has to stand in a certain position, the occurrence is not at all uncommon. Such interruptions, of course, are wholly temporary since the tremendous power behind the supply of current instantaneously turns the bird into smoke, and the prompt opening of the circuit-breakers at the ends of the section extinguishes the arc. The circuit-breakers are thrown in immediately afterward by the operator at the nearest interlocking tower, at which point distant control is provided, and thus delay is avoided.

Comment may be made also in connection with the item headed 'Section break bridged by car." This class of accident, which is really an operating failure rather than a failure of the contact system, is brought about by a train (generally a freight train) running from a live section of the main line into a siding that normally stands out of service. For such sidings the contact wire is sectionalized by a wood break at the end adjoining the main line, and a knife-switch with a back contact grounds the siding when it is open. The ends of the contact wires are run out in wings past the wood break and thus power is not cut off and reapplied to a car that passes from the main line to the siding if the siding is alive. However, if the siding is dead, the passage of a pantograph shoe on a car moving into the dead section provides a short circuit from the live contact wire, across the air gap, to the grounded wire parallel to it, and this grounds the live section.

In the record for June, 1916, the unusual number of fourteen interruptions charged to trolley insulator grounds were brought about largely by failures of the previously mentioned strain insulators which have now been largely replaced with wood-stick insulators.

Of the interruptions shown under the head of miscellaneous, the one occurring in April, 1915, was a case where power was off all lines because of an extraordinary snowfall. The weight of the wet snow that collected on the horizontal safety screens (installed at various points to protect workmen or the public from contact with live conductors) was sufficient to buckle a number of them and thus ground the lines at several points.

The miscellaneous interruption that appears in June, 1915, was due to a grounded arcing-shunt of a circuit breaker on a sectionalizing bridge, and the one shown for July was caused by a short-circuit in a station-lighting transformer. The latter involved the three-phase line only, and this class of interruption, as mentioned before, does not affect the propulsion power supply. The series of failures indicated in the miscellaneous record for September, 1915, came about through an excessively hot day, the change in temperature being sufficient to crack several porcelain insulators and thus permit grounds.

In the record for October, 1915, the two miscellaneous interruptions were due to grounded jumpers on one of the sectionalizing bridges, and the two in December were due to a severe sleet storm that lasted through two successive days and caused several grounds on the lines, including also grounds on several of the pantographs on cars. The miscellaneous interruption recorded in February, 1916, was caused by a flash-over to ground that occurred in a low-roofed tunnel through which the road runs, and the two failures recorded in September, 1916, came about through broken pull-off wires that dropped with the live portion against the roof of a passing car. The October interruption was due to a grounded sectionalizing switch, and the same cause accounts for the two November interruptions. The miscellaneous interruptions appearing respectively in January and February of this year were both due to short-circuits of station-lighting transformers which, as before described, opened the three-phase circuit only.

Comments on Some Disputed Points in Car Design

R. E. Danforth, General Manager of the Public Service Railway, Discusses Open vs. Closed Car, Longitudinal Seats, Ventilation and Other Points

THE Public Service Railway, which forms a part of the Public Service Corporation of New Jersey, operates electric cars under as widely varying conditions as any property in this country. It has city, suburban and interurban lines widely scattered over the State. The general manager of this system, R. E. Danforth, has been a careful student of car design as related to this interesting property, and has determined certain principles which apply to local conditions. A representative of the ELECTRIC RAILWAY JOURNAL recently called on Mr. Danforth and asked him to give his views on the subject of car design.

R. E. DANFORTH

Mr. Danforth said: "I do not agree with many managers of electric railways as regards the future of the open car. I notice that it is the fashion now to decry this car and that very few orders are being given for it. The ELECTRIC RAILWAY JOURNAL seems also to be of the opinion that this type of car is practically dead. The chief objections to the car seem to be an alleged liability to accidents and the impossibility of applying the prepayment system of fare collection to it. Now, while I am willing to admit that the open car is not as desirable, comparatively speaking, as it formerly was, there are still conditions under which it is the best type of car. One of these is in localities where the hot season is long. The Public Service Railway has so much faith in this type of car that during 1916 it built 126 open car bodies, and is building fifty more for 1917. During this season it will have more than 600 of these cars in operation. The chief advantage of this type of car is that it is popular with the public. No other type in summer is as good a business-getter. There is a sense of airiness and openness to this type of car which is not possessed by any other, and which appeals strongly to the average passenger on a hot summer day or evening.

"Some of the other important advantages of this type of car are that it is inexpensive to build, it is light in weight, it possesses the maximum seating capacity for its floor area, and it is quick in loading and unloading. We have not found any serious increase in the number of accidents due to the use of this car. The experience of the Public Service Railway with the very long type of open car used by this company was described in the issue of the ELECTRIC RAILWAY JOURNAL for June 19, 1916, page 1171, and it was on the basis of the experience there described that the company is building the fifty open cars mentioned before. In my opinion, it will not be many years before there will be a sufficiently large demand for open-bench cars to warrant the manufacturers in building them regularly. With modern methods of handling car bodies, it is a very simple matter to remove the open car bodies from the trucks at the end of the summer season for storage during winter."

Another interesting point made by Mr. Danforth was in connection with the longitudinal-seat car. He said:

"While I agree in part with the contention of a recent editorial in the ELECTRIC RAILWAY JOURNAL to the effect that there is a narrow field on urban surface lines for the longitudinal-seat car, I firmly believe that under certain conditions its use is not only permissible, but actually necessary to obtain real accommodation for the public. Where very heavy peak loads must be carried for short distances passengers prefer to stand rather than to wait for following cars. In standing they are far more comfortable in a longitudinal-seat car, which is provided with proper facilities for the convenience of standees, than they are in a cross-seat car where their presence interferes with the movement of passengers through the car. Crowded in a narrow aisle, as in a cross-seat car, standees interfere with the proper distribution of their own number, so that standing room in one part of the car may be at a premium whereas other parts are far from filled.

"The important advantages of the longitudinal-seat cars are that they possess great emergency capacity, and they permit rapid movement of passengers from one part to another."

As is well known, Mr. Danforth holds certain positive views regarding car ventilation. On this subject he said:

"My observation and experience have shown very clearly that, while the monitor deck roof in its old form may not be desirable, a modern roof must provide the ventilating equivalent of the old type if ventilation is to be successful. In the closed cars now building for the Public Service Railway, a so-called compromise roof is used. This from the standpoint of ventilation is equivalent to the older form of roof, which it closely resembles in appearance. While it is true that good ventilation is secured in a few arched-roof cars, this is due to the fact that in such cars there is considerable space between the roof and the headlining. This space is to a considerable extent the equivalent of the monitor deck, and is used to contain air ducts.

"The difficulty of securing good ventilation in a car in which there is not the equivalent of a monitor deck has been clearly demonstrated by a special car which we use for parties, etc., and which is furnished with both forced and exhaust-draft fans. The capacity of either of these fans is ample to change the air in the car every three minutes, but with both fans operating the ventilation is unsatisfactory. There is a vital ventilating principle in having openings through which air can circulate in horizontal planes as it can in the old-fashioned monitor deck roofs or in the compromise roofs provided with louvers equivalent to the older deck sash. Successful ventilation consists in the movement of large volumes of air, and the ventilating device must create a positive air movement. The difficulty with fans is that they move diluted air. It is possible with a monitor roof so to install ventilators that disagreeable down drafts are avoided."

In connection with the general subject of car maintenance Mr. Danforth made a number of valuable suggestions regarding the keeping and use of records. He said: "I believe that there is great opportunity for improvement in the matter of record keeping systems. Sometimes very elaborate detailed schemes are used when only general over-all costs are required. The lack of needed records is absolutely inexcusable, but when such records have served their purpose they are, of course, useless and should not be kept up. The purpose of records is to induce economies, and to produce this effect it should be possible to confront any individual responsible for expenditures with a record of what he has spent and how he has spent it, and all of this within a few days of the actual expenditure. These records, however, need go into great detail only on special occasions when some unusual expenditure is to be analyzed. They should, moreover, never be so cumbersome that they are studied only by the man who makes them. A busy man will not wade through oceans of detail for the information which he desires.

"In this connection, I found it possible on one railway system in which I was interested to reduce the storeroom clerical force by 75 per cent by eliminating the keeping of elaborate records which, while they would have proved interesting for special studies, were not used sufficiently to justify their cost. The kinds of records that are most valuable are those permitting a comparison of the use of supplies and labor on several divisions of one system, and of the rates of consumption of these elements per unit on the same divisions during different periods. Such data can be brought down to surprisingly small compass if only the essentials are included. The more analytical records referred to before may be necessary when the general records reveal excessively high rates of consumption on certain parts or in certain quarters. The danger in such cases is that the analysis made for such a purpose may be incorporated in the office routine and become a permanent burden."

As Mr. Danforth will in a few weeks complete his tenth year of service as general manager of Public Service Railway, in which position he succeeded Albert (now Sir Albert) H. Stanley, a few words regarding his career are not inappropriate. This career has had one dominating characteristic, an intense devotion to the principle of singleness of purpose as a requisite to success. From the time when, as a boy, he forced the management of the then recently electrified street railway in Buffalo, N. Y., to give him a job in spite of itself, he has accomplished task after task through concentration and devotion to his work. He is at the same time one of the most considerate of men, always ready to lend a hand in any movement which promises better working conditions for his men. He is constantly striving to develop the native abilities of his assistants for the company's benefit and their own. For this reason he instigated the formation of the local company section of the American Electric Railway Association and has loyally supported it. For the same general purpose he instituted a cadet course some years ago for the purpose of trying out and training technical graduates. His spirit is shown by his statement to the boys at one time: "Whenever one of you boys is ready for my job I shall step out." As a college graduate, Cornell, '91, he has always appreciated the fact that a college course can do much for a young man of the right type. He has, however, consistently ruled that the graduate begin at the bottom without any prejudice in his favor and make his way solely on merit.

Mr. Danforth is a disciplinarian who expects to work hard himself and to be surrounded with diligent coworkers. He has no patience with inefficiency. While of none too robust a constitution he has, by the exercise of care, been able to do the exacting work incident to his several responsible positions without exhaustion. These positions have included among others the superintendency of the Buffalo (N. Y.) Railway and the general managership of the Rochester (N. Y.) Railway.

Experiments with Non-Bleeding Paving Blocks

Experiments have been made in Minneapolis with so-called non-bleeding paving blocks laid with sand and ordinary pitch filler. Very little oil appeared on the surface of the sand-filled sections, but the other sections showed considerable bleeding, which was thought to be due to the filler. Other experiments indicated that blocks laid at angles of 67½ deg. and at 45 deg. with the curb show less trouble from joint wear than those laid at 90 deg. Expansion joints at right angles to the curb are not considered useful or beneficial.

Analysis of Track Maintenance Costs

Data and Deductions from Ten Years' Records of Maintenance Costs on Nearly a Hundred Miles of Surface Track in Brooklyn, N. Y.

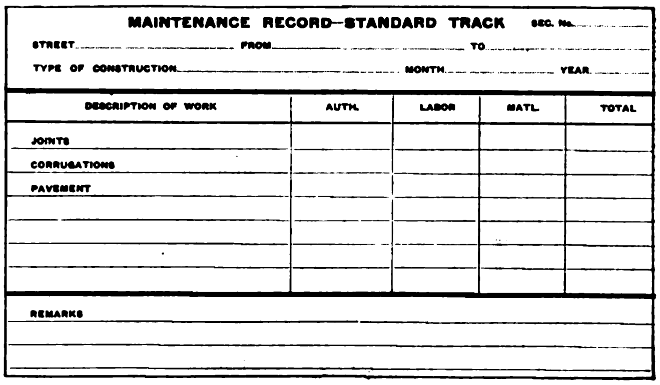
By R. C. CRAM
Assistant Engineer, Way and Structure Department, Brooklyn Rapid Transit System

THE subject of unit costs for comparison of track maintenance expenses has had much attention during the year past as developed in the editorial correspondence of the ELECTRIC RAILWAY JOURNAL. Perhaps the prevailing thought emphasized throughout the discussion was to the effect that such units in the first instance would have their chief value in permitting comparisons of track types and their maintenance costs in varying conditions as developed on one property.

LIMITATIONS IN COMPARING MAINTENANCE DATA

It is thought that the lack of uniformity in standards of track maintenance on different properties will continue for some time to come, particularly as no two properties are situated in similar positions as regards financial ability. For this reason alone, comparisons of unit costs for track maintenance between different properties are very apt to be misleading even though the properties may have identical standard types of track construction.

It is indeed most unfortunate that several years of service are usually required for the development of the principal defects in a track structure located in a paved street. It is also equally unfortunate that there may be several changes in the engineering staff of the railway, and very likely the engineer most competent to judge the performance of tracks, even when assisted by records of maintenance costs, may have left the property by the time the records become of value. It is therefore quite true that, as the JOURNAL said editorially, "It must be remembered that the successful use of any unit cost depends on the accuracy of the accounting methods used in determination of that cost," but to this should be added the statement that the person analyzing such cost should have an intimate knowledge of the property covering the period for which the records are kept.



MAINTENANCE RECORD—STANDARD TRACK SEC. No. ______

STREET ______ FROM ______ TO ______

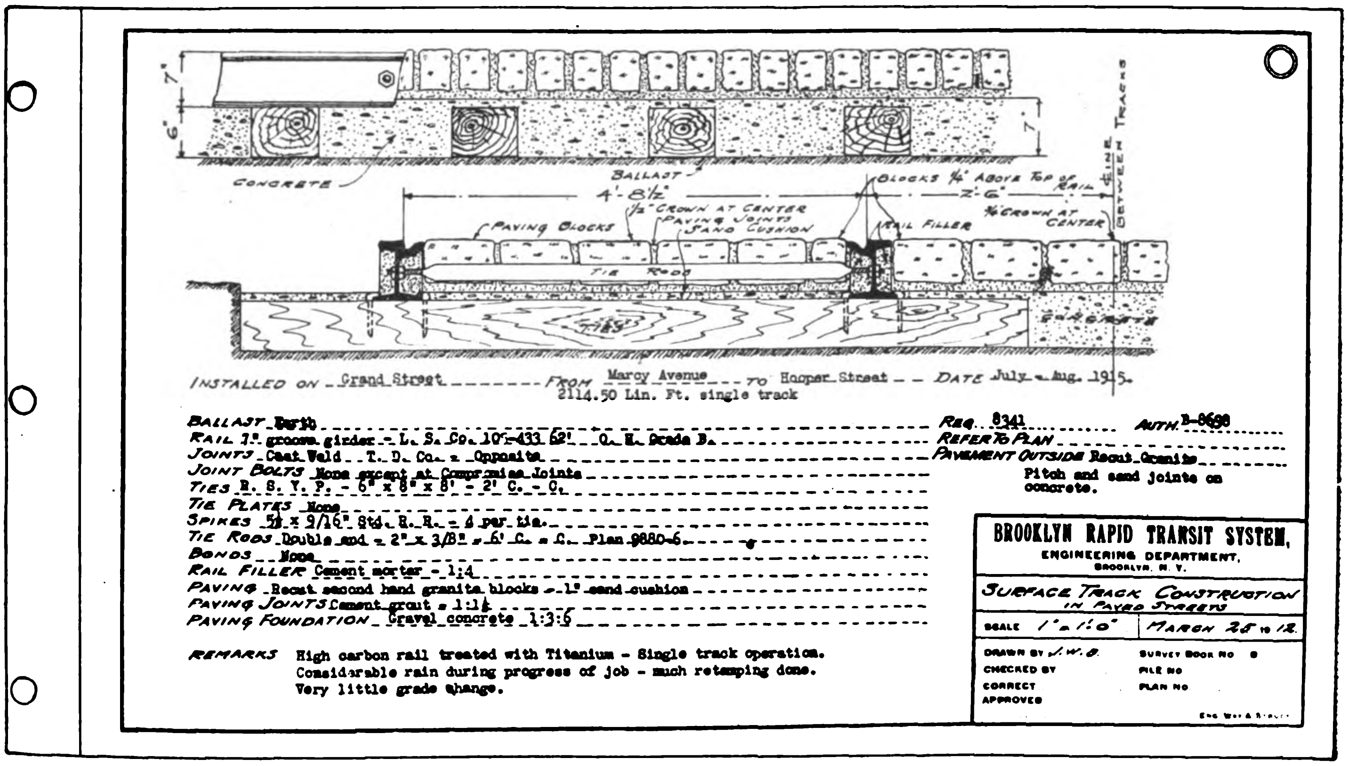
TYPE OF CONSTRUCTION ______ MONTH ______ YEAR ______

DESCRIPTION OF WORK	AUTH.	LABOR	MATL.	TOTAL
JOINTS				
CORRUGATIONS				
PAVEMENT				

REMARKS ______

TRACK MAINTENANCE DATA—FIG. 1, BLANK FORM USED IN RECORDING DATA

Nevertheless, there is no doubt as to the wisdom of making every reasonable effort, even at considerable expense, for the purpose of obtaining cost information in such degree of detail as will enable the engineer to make a correct analysis of expenditures for track maintenance with the view to eliminating such features of construction as may be found to have led to high maintenance charges.



INSTALLED ON Grand Street FROM Marcy Avenue TO Hooper Street DATE July - Aug. 1915.
2114.50 Lin. Ft. single track

BALLAST Earth
RAIL 7" groove girder - L. S. Co. 107-433 62' O. H. Grade B.
JOINTS Cast Weld - T. D. Co. - Opposite
JOINT BOLTS None except at Compromise Joints
TIES R. S. Y. P. - 6" x 8" x 8' - 2' C. - C.
TIE PLATES None
SPIKES 5½ x 9/16" Std. R. R. - 4 per tie.
TIE RODS Double end - 2" x 3/8" - 6' C. - C. Plan 9880-6
BONDS None
RAIL FILLER Cement mortar - 1:4
PAVING Recut second hand granite blocks - 1" sand cushion
PAVING JOINTS Cement grout - 1:1½
PAVING FOUNDATION Gravel concrete 1:3:6

REQ. 8341 AUTH. B-8698
REFER TO PLAN ______
PAVEMENT OUTSIDE Recut Granite
Pitch and sand joints on concrete.

REMARKS High carbon rail treated with Titanium - Single track operation.
Considerable rain during progress of job - much retamping done.
Very little grade change.

BROOKLYN RAPID TRANSIT SYSTEM,
ENGINEERING DEPARTMENT,
BROOKLYN, N. Y.

SURFACE TRACK CONSTRUCTION
IN PAVED STREETS

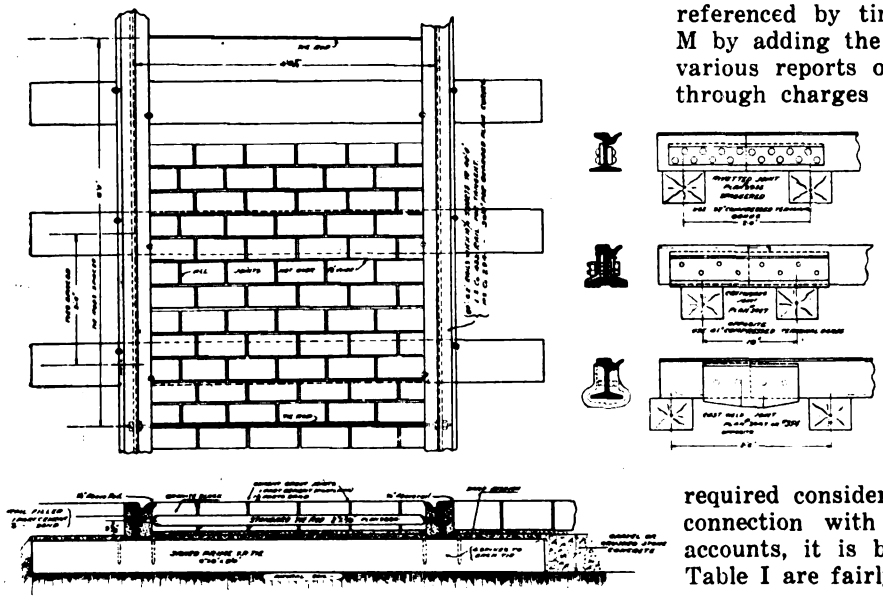
SCALE 1" = 1'-0" MARCH 25 19 12.

DRAWN BY J. W. B. SURVEY BOOK NO. 8
CHECKED BY FILE NO.
CORRECT PLAN NO.
APPROVED

TRACK MAINTENANCE DATA—FIG. 2, FORM USED FOR PERMANENT RECORD OF SURFACE TRACK CONSTRUCTION IN PAVED STREETS, B. R. T. SYSTEM

Perhaps the most important statement made in the JOURNAL'S editorials on the subject is that appearing on page 257 of the issue for Aug. 12, 1916, which was as follows: "It must further be remembered that it is the average annual cost that is of value as a comparative unit." The subject has had our consideration in Brooklyn on this basis for several seasons, and it is thought that the results of the efforts to obtain such units have fully confirmed our opinions as to the value of the data and of the effort that has been required to obtain the information here presented. Due allowance must be made for some apparent inconsistencies in the tables which follow, but these are mainly due to occasional misunderstandings on the part of the many persons who are necessarily engaged in gathering, reporting and distributing the various charges in detail.

The maintenance data collected on the Brooklyn Rapid Transit System are presented in the accompanying tables and graphs, but it will readily be appreciated that they would be of no particular service to other engineers without some explanations. These in turn clearly show how little value such records have even for the property upon which they are secured if the results cannot be analyzed in the light of experience and knowledge of the factors which have had an influence in causing the more radical variations from the average units.



TRACK MAINTENANCE DATA—FIG. 3, B. R. T. STANDARD SURFACE TRACK CONSTRUCTION WITH WOOD TIES AND GRANITE BLOCK PAVING

COLLECTING AND RECORDING MAINTENANCE DATA

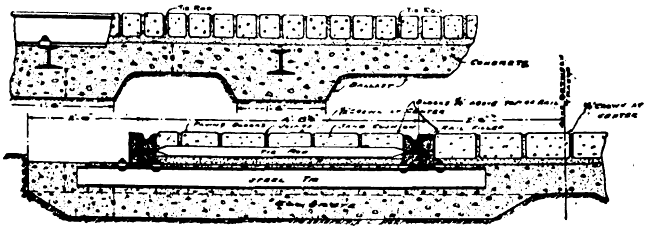
The way and structure department of the Brooklyn Rapid Transit System, under the direction of C. L. Crabbs, engineer of way and structure, has been engaged in the collection and tabulation of data on maintenance costs on the modern standard surface tracks of the system as built since 1907. Statistics have been gathered covering items considered as strictly maintenance repairs on standard surface tracks since reconstruction, and excluding all charges to maintenance accounts accruing to those accounts as occasioned by the extraordinary charges due to reconstruction. In other words, the records are intended to show charges for the regular maintenance expenses to date on standard tracks since their reconstruction. Table I gives a summary of information obtained in detail by the surface track division, compiled through the use of Form M, as shown in Fig. 1. It will be seen that this from is designed to segregate charges into three general classes, viz., joints, corrugation and pavement, with space for special items and for remarks.

Before this form was put in use it had already been found desirable to make up a permanent record of the type of construction used on each job, and this record is used as the basis for securing cost data by means of the section number designated in the circle shown in the upper right-hand corner of the record drawing reproduced in Fig. 2. This obviates the necessity for separate job orders for each bit of maintenance work on the standard sections, as all such work need only be referenced by timekeepers and cost clerks on Form M by adding the section number to the items in the various reports of labor and material, as segregated through charges to annual blanket authorizations for maintenance of joints, repairs to pavement and grinding corrugation. A list of standard sections is furnished to all timekeepers, material clerks, supervisors and others having to do with supervision and accounting for materials and work. A check as to whether charges are being made to the sections as incurred is had by following the daily gang assignment record from which it is readily determined whether or not work is in progress on standard sections. While this system has required considerable effort and special accounting in connection with regular routine of distribution of accounts, it is believed that the resulting figures in Table I are fairly accurate.

DEVELOPMENT OF THE STANDARD TYPE OF CONSTRUCTION

A brief description of the development of the standard construction should be of assistance in considering the data presented in the tables. It was not until 1909 that complete replacement with modern construction began to be warranted to any great extent.

The work that was done in 1907 consisted of new construction under new franchises, while that in 1908 covered one fair-sized reconstruction job and one other very small section. The type of construction adopted for the more extensive work beginning in 1909 is shown in Fig. 3. This was continued only during that season, being modified in 1910 by the substitution of wood ties as shown in Fig. 4.



TRACK MAINTENANCE DATA—FIG. 4, B. R. T. SURFACE TRACK CONSTRUCTION WITH STEEL TIES

Installed on Flatbush Avenue from Fulton to Fiftieth Street, April to June, 1909. Ballast, stone concrete; rail, 7-in. grooved girders, L. S. Co. 102-423, and P. S. Co. 102-284, 60-ft. length; joints riveted, 29½-in. plate, 16 holes staggered; ties 7 ft. Carnegie Steel Co. M25, 14½ lb., 4 ft. c. to c.; rails attached with steel clips and bolts, four per tie; tie rods, 2 in. x ⅜ in., 4 ft. c. to c., partly 8 ft. c. to c.; bonds, one 371in. compressed-terminal cross-bonding every 1000 ft.; rail filler, cement mortar; paving, 5-in. granite blocks; paving joints, cement grout; paving foundation, combined stone and concrete. During construction traffic was run on temporary siding Lafayette to Fourth Avenues; silicate of iron was used in concrete in parts.

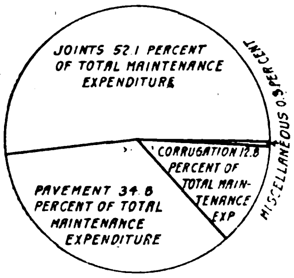
In the latter part of 1911 the riveted joint was definitely abandoned and cast-weld or continuous joints were substituted. The latter were primarily for situations under elevated structures and other places where conditions were not satisfactory for use of the welding cupola. This combined use of the two types last mentioned was continued until 1914, since which time practically all joints have been cast welded. It will be noted that steel ties and riveted joints, used almost exclusively from 1908 up to 1911, are located in the sections showing the highest maintenance charges, while the charges show definite decreases beginning in 1911, when wood ties were substituted. The tabulations seem to show the wisdom of the changes both in ties and in type of joints.

Table I gives a tabulation of the detailed charges obtained from Form M divided into three general classes of joints, pavement and corrugation. It also shows the length of each section, the total expenditure on each section from date of reconstruction to Jan. 1, 1917; the total cost per foot of single track to Jan. 1, 1917, for each section; the average annual cost per foot of single track for each section, as well as summaries giving grand totals and weighted averages. Columns have been added to the original tabulation to indicate the kinds of ties and joints in service.

TABLE I—MAINTENANCE COSTS—STANDARD SURFACE TRACK TO JAN. 1. 1917. BROOKLYN RAPID TRANSIT SYSTEM WAY AND STRUCTURE DEPARTMENT

Sec. No.	Street	From	To	Ties	Joints	Joints	Pavement	Corrugation	Misc.	Total	Length Ft. S. T.	Cost per Ft. to Date $	Year Laid	Cost per Ft. per Year $
1	Lafayette Avenue	Flatbush Avenue	Fulton Street	Steel	El. weld	$68.07	$208.09			$276.16	1,742	0.159	1907	0.018
2	Livingston Street	Court Street	Flatbush Avenue	Steel	El. weld	2963.22	5,767.79	$821.62	$10.89	9,563.52	6,509	1.468	1907	0.163
3	Bergen Street	Vanderbilt Avenue	300 ft. westerly	Wood	Rivet	2.22	51.55			53.77	600	0.089	1908	0.011
4	Fulton Street	Joralemon Street	Flatbush Avenue	Steel	Rivet	10,888.57	713.20	826.28		12,428.05	4,336	2.869	1908	0.358
5	Washington Avenue	Flushing Avenue	Creek	Steel	Rivet	578.74		285.82		864.56	3,448	0.251	1909	0.036
6	Ninth Avenue	Union Street	9th Street	Wood	Rivet	666.35	272.78	2,418.80		3,357.93	6,634	0.506	1909	0.072
7	Fulton Street	Myrtle Avenue	Tillary Street	Steel	Rivet	1,269.82		133.73		1,403.55	1,394	1.006	1909	0.144
8	Fulton Street	Flatbush Avenue	Hudson Avenue	Steel	Rivet	148.90	35.02			183.92	258	0.714	1909	0.102
9	Flatbush Avenue	Fifth Avenue	Plaza Street	Steel	Rivet	8,220.33	418.08	1,453.28		10,091.69	5,832	1.732	1909	0.248
10	Flatbush Avenue	Fulton Street	Fifth Avenue	Steel	Rivet	2,933.44	992.09	785.95		4,711.48	4,450	1.058	1909	0.151
11-18	Broadway	Havemeyer Street	Ralph Avenue	Steel	Rivet	36,782.61	21,958.33	1,302.09	187.00	60,230.03	21,953	2.748	1909	0.392
20	New Lots Avenue	Rockaway Avenue	Junius Street	Wood	Rivet		79.24			79.24	3,925	0.020	1910	0.003
21	Rockaway Avenue	East New York Ave.	Riverdale Avenue	Wood	Rivet	4,635.14	1,144.30	1,256.37		7,035.81	7,850	0.896	1910	0.149
22	Nostrand Avenue	Fulton Street	Bergen Street	Wood	Rivet	61.16	537.16	382.59		980.91	2,782	0.352	1910	0.059
23	Flushing Avenue	Washington Avenue	Broadway	Wood	Rivet	883.32	4,983.47	387.98		6,254.77	13,710	0.456	1910	0.076
24	Fulton Street	Ashland Place	Vanderbilt Avenue	Wood	Rivet	7,650.18	1,658.47	203.19		9,511.84	6,212	1.532	1910	0.255
25	Bergen Street	Nostrand Avenue	Rogers Avenue	Wood	Rivet		9.44			9.44	1,238	0.007	1910	0.001
26	Bergen Street	Carlton Avenue	300 ft. w. of Vanderbilt	Wood	Rivet		66.94			66.94	982	0.669	1910	0.111
27	Court Street	Fulton Street	Livingston Street	Steel	Rivet	822.03	667.43	3.27		1,492.73	1,156	1.291	1910	0.215
29	Manhattan Avenue	Driggs Avenue	Newtown Creek	Wood	Rivet	1,239.68	3,820.07	643.00		5,702.75	10,252	0.556	1911	0.111
30	St. Johns Place	New York Avenue	Albany Avenue	Wood	Cast weld.	237.82	86.70	496.83		821.35	4,250	0.193	1911	0.039
31	Fifth Avenue	Prospect Avenue	25th Avenue	Wood	C. W. & riv.	4.00		42.52		46.52	4,264	0.011	1911	0.002
32	Flatbush Avenue	Lincoln Road	E. 26th Street	Wood	Rivet	695.76	42.40	1,776.62		2,514.78	15,415	0.164	1911	0.033
33	Flatbush Avenue	L. I. R. R.	Nostrand Avenue	Wood	Rivet	2.21	8.78	139.21		150.20	882	0.171	1911	0.034
34	Fifth Avenue	Atlantic Avenue	Flatbush Avenue	Wood	Rivet		15.85			15.85	570	0.028	1911	0.005
35	New Lots Road	Junius Street	Berriman Street	Wood	Rivet		119.60			119.60	13,780	0.009	1911	0.002
36	Driggs Avenue	No. 12th Street	Lorimer Street	Wood	Rivet		187.20			187.20	948	0.198	1911	0.039
37	Broadway	Bedford Avenue	Roebling Street	Wood	Rivet	29.18	372.40	52.09		453.67	1,534	0.296	1911	0.059
38	Fifth Avenue	Flatbush Avenue	Prospect Avenue	Wood	Rivet	517.93	1,887.04		51.32	2,456.29	14,604	0.169	1911	0.024
39	Seventh Avenue	Flatbush Avenue	Fourteenth Street	Wood	Continuous	14.51	519.24			533.75	11,754	0.046	1912	0.012
40	Fulton Street	Vanderbilt Avenue	Reid Avenue	Wood	Continuous	156.40	1,547.19			1,703.59	20,710	0.083	1912	0.021
43	Sterling Place	Washington Avenue	Rogers Avenue	Wood	Cont. & c. w.	115.58	221.61	212.53		549.72	5,040	0.108	1912	0.027
44	Church Avenue	Gravesend Avenue	36th Street	Wood	Rivet	2.13		33.24		35.37	2,198	0.016	1912	0.004
46	Flatbush Avenue	Malbone Street	Lincoln Road	Wood	Cast weld	62.40		133.08		195.48	1,342	0.146	1912	0.036
47	Rockaway Avenue	Riverdale Avenue	Hegeman Avenue	Wood	Cast weld	568.25	328.83	758.59		1,655.67	3,352	0.494	1912	0.123
48	5th Avenue	60th Street	65th Street	Wood	Cast weld	14.16	57.52	16.18		87.86	1,794	0.049	1912	0.012
50	3rd Avenue	Hamilton Avenue	26th Street	Wood	Cast weld	27.92	600.64	25.96		654.52	4,354	0.151	1912	0.038
51	Nostrand Avenue	Fulton Street	Putnam Avenue	Wood	Continuous	32.90	614.81	49.03		696.74	2,332	0.297	1912	0.074
52	Washington Avenue	Sterling Place	Atlantic Avenue	Wood	Cast weld	213.81	149.45	5.67		368.93	4,418	0.084	1912	0.021
53	Flatbush Avenue	Park Plaza	Malbone Street	Wood	Cast weld	22.40		728.39		750.79	7,274	0.103	1912	0.025
54	Malbone Street	Nostrand Avenue	Kingston Avenue	Wood	Cast weld	16.46				16.46	4,586	0.004	1912	0.001
55	16th Avenue	58th Street	Sea Beach Line	Wood	Cast weld	4.32				4.32	2,230	0.002	1912	0.001
56	Bergen Street	Vanderbilt Avenue	Franklin Avenue	Wood	Cast weld	66.12	1,374.21	.35		1,440.68	6,786	0.212	1913	0.071
57	Church Avenue	Stratford Road	Ocean Parkway	Wood	Cast weld	10.61		70.61		81.22	2,339	0.035	1913	0.012
58	Church Avenue	Ocean Parkway	Gravesend Avenue	Wood	Cast weld		12.25	892.10		904.35	2,282	0.396	1913	0.132
59	Corona Avenue	Luona Avenue	Sycamore Avenue	Wood	Continuous		16.72			16.72	2,902	0.006	1913	0.002
60	Court Street	Atlantic Avenue	Hamilton Avenue	Wood	Continuous	87.55			15.19	102.74	11,820	0.009	1913	0.003
61	Fifth Avenue	25th Street	39th Street	Wood	Continuous	168.15	145.28	169.78		483.21	6,966	0.069	1913	0.023
62	Fifth Avenue	39th Street	60th Street	Wood	Continuous		74.20			74.20	10,782	0.007	1913	0.002
64	Flatbush Avenue	E. 26th Street	Nostrand Avenue	Wood	Continuous	72.34		296.41		368.75	4,182	0.088	1913	0.029
65	Flushing Avenue	Navy Street	Washington Avenue	Wood	Cont. & plain		3,162.84			3,162.84	6,990	0.452	1913	0.151
69	St. Johns Pl.&E.N.Y.	Ralph Avenue	Rockaway Avenue	Wood	Cast weld	438.53	144.48	920.89		1,503.90	5,340	0.282	1913	0.094
70	Third Avenue	Flatbush Avenue	Hamilton Avenue	Wood	Cast weld	1,920.16	1,765.94			3,686.10	16,796	0.221	1913	0.074
71	Third Avenue	39th Street	60th Street	Wood	Continuous	42.21				42.21	10,526	0.004	1913	0.001
72	Vanderbilt Avenue	Atlantic Avenue	DeKalb Avenue	Wood	Cast weld		221.00			221.00	5,360	0.041	1913	0.014
73	Church Avenue	New York Avenue	Brooklyn Avenue	Wood	Cast weld	22.14		5.57		27.71	1,885	0.015	1913	0.005
76	Fifth Avenue	Bay Ridge Avenue	65th Street	Wood	Cast weld		15.26	6.68		21.94	2,241	0.010	1914	0.002
77	St. Johns Place	Albany Avenue	Ralph Avenue	Wood	Cast weld		12.81	1,224.77		1,237.58	8,994	0.138	1914	0.069
79	Broadway	Ralph Avenue	Jamaica Avenue	Wood	Cast weld	86.33			119.76	206.09	14,966	0.014	1914	0.007
80	Myrtle Avenue	Broadway	Boro. Line	Wood	Cast weld	41.13		41.02		82.15	12 459	0.007	1914	0.004
81	Greene Avenue	Fulton Street	Franklin Avenue	Wood	Cast weld	100.62	31.60	174.76		306.98	8,788	0.035	1914	0.017
82	Flushing Avenue	Broadway	Knickerbocker	Wood	Cast weld	100.99				100.99	7,372	0.014	1914	0.007
83	Grand Street	Flushing Avenue	Juniper Avenue	Wood	Cast weld	229.72		212.85		442.57	2,560	0.174	1914	0.087
84	Hamilton Avenue	3rd Street	Columbia Street	Wood	Cast weld	408.83		6.33		415.16	9,685	0.043	1914	0.021
88	Franklin Avenue	Eastern Parkway	Malbone Street	Wood	Cast weld	303.52		4.54		308.06	4,710	0.065	1914	0.032
89	Nostrand Avenue	Flushing Avenue	Putnam Avenue	Wood	Cast weld	29.00	450.26			479.26	9,257	0.052	1914	0.026
90	Flatbush Avenue	L. I. R. R.	Kings Highway	Wood	Cast weld			1,534.59		1,534.59	7,958	0.191	1914	0.095
91	Bergen Street	Smith Street	Flatbush Avenue	Wood	Cast weld		50.70			50.70	8,988	0.006	1914	0.003
92	Broadway	Hoffman Blvd.	Corona Avenue	Wood	Continuous			95.76		95.76	1,945	0.049	1914	0.024
94	Gates Avenue	Franklin Avenue	Reid Avenue	Wood	Cast weld	17.21	10.09	38.00		65.30	14,243	0.005	1915	0.005
98	Bergen Street	Nostrand Avenue	Kingston Avenue	Wood	Cast weld	19.12				19.12	4,496	0.004	1915	0.004
99	Washington Street	Myrtle Avenue	Tillary Street	Wood	Cast weld	10.84	2.77			13.61	1,361	0.010	1915	0.010
104	Avenue "N"	Flatbush Avenue	E. 49th Street	Wood	C. w. & Plain	4.17	315.03	4.10		323.30	2,220	0.145	1915	0.145
105	Jay Street	High Street	Concord Street	Wood	Cast weld	28.83				28.83	948	0.030	1915	0.030
108	Nostrand Avenue	Stockton Street	Willoughby Avenue	Wood	C. w. & cont.		65.86			65.86	1,564	0.042	1915	0.042
	Totals and averages					$86,760.04	$58,014.01	$21,073.02	$384.16	$166,231.23	Averages for above items 152,605	0.367	3.91 years average	0.0938
	Length of sections on which no work has been done since reconstruction									67,721			1.75 Avg Age	Non-Expense
	Total and averages, including non-expense track									520,326	0.319		3.66	0.0871

There are a total of 111 sections of standard track covered by the investigation, with a total length of 520,326 ft. or 98.5 miles of single track. Of these sections some expense is reported on eighty-two, having a total length of 452,605 ft. or 85.7 miles of single track. Hence there were found twenty-nine sections on which no money had been spent. These had a total length of 67,721 ft. or 12.8 miles of single track, which in turn is 13 per cent of the total trackage.



TRACK MAINTENANCE DATA—FIG. 5, GRAPHICAL REPRESENTATION OF ASSIGNMENT OF MAINTENANCE CHARGES

WHAT THE TABULATION SHOWS

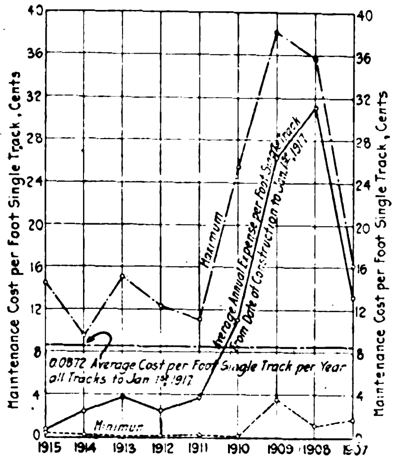
The most important monetary results are shown in the grand totals and averages in Table I, where it will be seen that the total cost per foot of single track to Jan. 1, 1917, for expense tracks has been 36.7 cents for tracks having an average age of three and nine tenths years. The average annual cost per foot of single track for the same track was 9.38 cents. The average age of non-expense tracks was one and seventy-five-hundredths years. The total cost per foot of single track for all tracks (both expense and non-expense) was 31.9 cents for tracks having an average age of three and sixty-six-hundredths years. The average annual cost per foot of single track for all tracks was 8.72 cents.

Fig. 5 gives a graphical illustration of the segregation of the principal expense charges from Table I. It will be noted that joint maintenance represents 52.1 per cent, pavement 34.8 per cent, and corrugation 12.8 per cent of the total maintenance expenditure. Incidentally it has been found that about 26 per cent of the pavement expense is due to pavement repairs at joints following repairs to the latter.

Table II gives another arrangement of data from Table I wherein the average annual cost per foot of single track is given for each annual construction group. It should be remembered that the costs shown are not for any particular year, but are the averages for the several construction groups for varying years of service. No attempt is made to show the expenditures arranged for years in which the expense occurred. Fig. 6 is a graphic presentation of data from Table II. It indicates even more clearly the effect of the changes from steel to wood ties and from riveted to cast-weld and continuous joints.

TABLE II—ARRANGEMENT OF DATA FROM TABLE I TO SHOW COSTS FOR EACH ANNUAL TRACK CONSTRUCTION GROUP

Year Laid	FEET OF SINGLE TRACK			AVERAGE ANNUAL COST PER FOOT SINGLE TRACK			
	Non-Expense Track	Expense Track	Total Length	Max.	Min.	Av. on Expense Tracks	Av. on All
1907...	......	8,251	8,251	$0.163	$0.018	$0.132	$0.132
1908...	......	4,936	4,936	0.358	0.011	0.313	0.313
1909...	748	43,969	44,717	0.392	0.036	0.265	0.263
1910...	525	37,855	38,380	0.255	0.001	0.112	0.110
1911...	......	66,499	66,499	0.111	0.002	0.037	0.037
1912...	3,560	71,384	74,944	0.123	0.001	0.025	0.024
1913...	11,579	94,956	106,535	0.151	0.001	0.042	0.037
1914...	9,134	99,923	109,057	0.095	0.002	0.026	0.024
1915...	42,175	24,832	67,007	0.145	0.004	0.020	0.007
	67,721 12.8 miles s. t.	452,605 85.7 miles s. t.	520,326 98.5 miles s. t.	......	......	Average 0.0938 Average $495 per mile per yr	Average 0.0872 Average $460 per mile per yr.



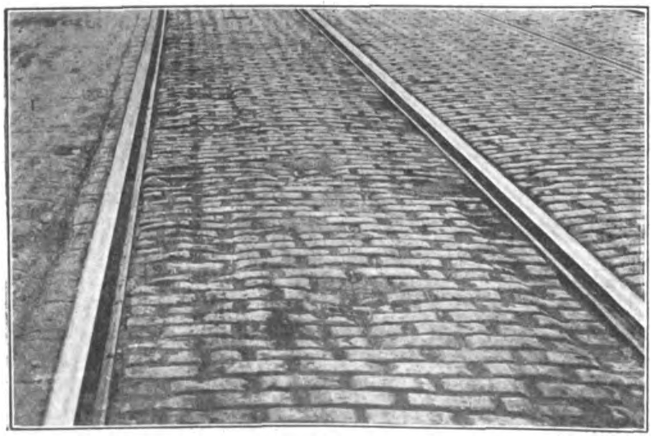
TRACK MAINTENANCE DATA—FIG. 6, CHART OF MAINTENANCE COSTS FOR TRACK OF DIFFERENT AGES

Table III presents further data indicating high expense due mainly to type of ties and joints. The striking features brought out are that while the mileage showing the highest expense is only 11.4 per cent of

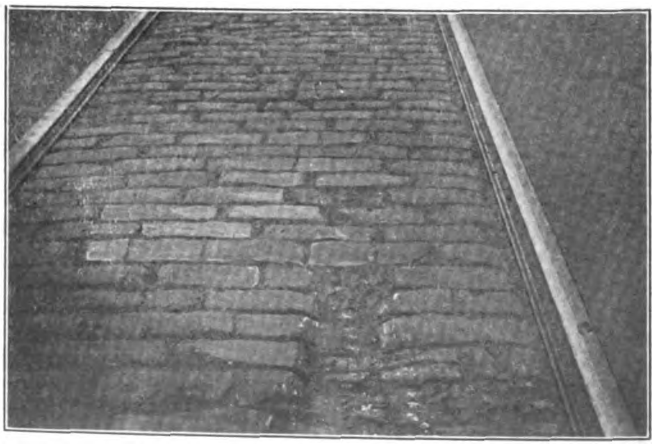
TABLE III—TOTAL EXPENSE TO JAN. 1, 1917, ON FIFTEEN SECTIONS WHICH HAVE PRODUCED THE HIGHEST UNIT COSTS

Sect. No.	Length Ft. S. T.	Year Laid	Total Expense	Cost per Ft. S. T. to Date	Reasons Assigned for High Expense
2	6,509	1907	$9,564	$1.468	Slag brick pavement.
4	4,336	1908	12,428	2.869	Rivetted joints, steel ties.
7	1,394	1909	1,404	1.006	Rivetted joints, steel ties.
9	5,832	1909	10,092	1.732	Rivetted joints, steel ties.
10	4,450	1909	4,711	1.058	Rivetted joints, steel ties.
11-18	21,953	1909	60,230	2.748	Rivetted joints, steel ties, location under L structure, poor roadway contour, excessive street sprinkling.
24	6,212	1910	9,512	1.532	Rivetted joints.
27	1,156	1910	1,493	1.291	Rivetted joints, steel ties, wood pavement and poor drainage.
Totals...	51,842 9.8 miles s. t.		$109,434	Av. 2.11	

NOTE.—Total length is 11.4 per cent of total expense trackage. Expenditure is 65 per cent of total expense.



TRACK MAINTENANCE DATA—FIG. 7, SLAG BRICK PAVING SHOWING DAMAGE NOT CAUSED BY RAILWAY



TRACK MAINTENANCE DATA—FIG. 8, GRANITE BLOCK PAVING SHOWING DAMAGE NOT CAUSED BY RAILWAY the total expense mileage, the expenditure on this small mileage is 65 per cent of the total expense for all trackage. No doubt age has something to do with this, and it is also realized that the car traffic on these sections is the heaviest on the system. With one exception, however, the greatest items of expense have been for joint repairs, and in all but one instance the joints in these sections were originally of the riveted type and the ties with one exception are steel. Only one section in this table indicates a high expense for pavement as the principal occasion for the heavy expense, and this particular pavement was an unfortunate experiment, on a rather extensive scale, with slag brick as a paving material on a street carrying a heavy vehicular traffic as well as heavy car traffic.

In further explanation of the high costs for certain sections it should be stated that in 1915 the sum of $43,000 (almost 25 per cent of the expense to date) was expended in a replacement of all riveted joints by arc weld repair joints on sections 9, 11, 12, 13, 14, 15, 16, 21 and 24, in an effort ultimately to reduce general maintenance charges. Similarly in 1916 there was an increase in expenditure of $3,000 over the previous year in the item of grinding corrugation, due to an effort to minimize the effects of a rather sudden increase in the amount of corrugation which accumulated in 1915. It will be noted that in the 1915 group, section No. 104 indicates a high cost for pavement. This is due to the fact that the section is not up to full standard, since the granite pavement was laid on a sand bed with sand joints. This was done because there were no sewers in the street and no pavement in the roadways outside the track. Within a very short time a large oil plant began to operate 5-ton delivery trucks over this pavement causing the expense indicated.

The data in the tables also furnished an opportunity for a study of the effect of the volume and weight of car traffic upon maintenance costs. There seems to be a prevailing impression that volume and weight of traffic are elements which greatly influence track maintenance charges, but from the study made thus far the records do not indicate that car traffic *per se* has such a definite relation to maintenance costs that a reasonable measure of its destructive force can yet be determined.

On the contrary, there is some evidence to substantiate the writer's belief, as previously stated in the columns of the JOURNAL, that within a very wide range the conduct of transportation, or in other words the number of cars or wheels operated, does not have the important bearing on track maintenance costs usually ascribed to this factor, except as it increases costs for actual work. For instance, it will be seen from Table I that sections 57 and 58 were built in the same year, with exactly the same type of construction, and one section is a continuation of the other. The car traffic is the same, 555 cars per day each way. Nevertheless, the average annual maintenance cost for one section is 1.2 cents per foot per year while for the other it is 13.2 cents, a difference of 12 cents. The serious trouble on one section in this case was occasioned by corrugation.

Another comparison may be made between sections 61 and 62. These were also built the same year on the same street, though not contiguous, and they have the same type of construction. The car traffic on section 61 is 303 cars per day each way, while the unit expense is 2.3 cents. The car traffic on section 62 is 374 cars per day each way, while the expense unit is only 0.2 cent, a difference in unit expense of 2.1 cents, with the higher unit on the section of lesser traffic. These instances serve to illustrate how impractical it is to assign definite values to the destructive effects of car traffic as a productive agent of regular maintenance expense.

C. E. R. A. Appoints Military Committee

Concluding Session of Annual Convention—Officers Were Elected and Two Past-Presidents Spoke—Papers on Wrought Iron and Standardization Were Presented

AT the final session of the Central Electric Railway Association annual convention, March 9, two other past-presidents of the association, in addition to the ones who had spoken at the Thursday meetings, addressed the association. These were W. S. Whitney, Springfield, Ohio, and A. W. Brady, Anderson, Ind.

Mr. Whitney confined his remarks largely to conditions surrounding traffic matters and remarked that at the close of his term as president of the association the total mileage of the lines of members of the Traffic Association and parties to the joint interline passenger tariff was about 3000 miles. At the present time it is about 4500 miles and this mileage will be represented in the joint interline passenger tariff now in course of publication and expected to issue the latter part of this month to become effective May 1. This increase in mileage, he said, was an additional asset to every line, since it opened up new territory for the interchange of long-haul passenger business.

Referring to freight traffic, he said that it was only a few years ago that this source of revenue was looked upon with scant consideration by numerous operating officials who thought then to confine it to a semi-express business and handle small packages on passenger cars only. A great deal of eloquence was in some instances necessary to convince officials of the value of this branch of traffic, but that time is past and freight revenue is now an item that sometimes spells the difference between an operating profit and red figures. While the freight earnings of member lines may not in all cases show a very large percentage of gross earnings, Mr. Whitney continued, it was his observation that in most instances this was not for the lack of prospective business, but rather for lack of equipment and freight facilities to care for that which might be secured. Congestion now existed in every city in the territory and business was being turned away daily because of these conditions. The prophecies of freight officials which in the past had often been considered illusions of a disordered imagination, had been more than verified.

Mr. Whitney referred to the completion of the joint time-table folder, the first issue of which appeared in January, and said that he considered this one of the big accomplishments of the association. This, with the official map and the joint interline passenger tariff, he said, from a traffic standpoint, constituted a trinity that rounded out to completeness the information necessary successfully to solicit a share of competitive business.

Mr. Brady addressed the association on the international situation and the need for the railways to prepare themselves in advance of the call in order to be of greatest service to the government. He said that it was evident from the manner in which the association had received the talks of C. L. Henry and Harry B. Smith, adjutant-general of the Indiana National Guard, that the railway men were loyal to the administration in the present serious situation, about the gravity of which there could be no doubt. He thought that the association should co-operate with the government to put the individual railways in a position to be of greatest service, should the government have occasion to call upon them. In this connection, he suggested the appointment of a committee which would take up with the military authorities and the government officials plans for the preparation of the electric railways in advance and for their efficient utilization if a crisis arises. The steam roads are badly congested and it might be that the electric roads would, therefore, offer an especially important assistance in the movement of troops and supplies.

In view of Mr. Brady's recommendation, the association passed a resolution creating a committee of eight members to be known as the "Committee on Military Efficiency and Defense" to co-operate with the army department, and President Wilcoxon appointed the following members of this committee: A. W. Brady, Anderson, Ind., chairman; J. F. Collins, Jackson, Mich.; Frank R. Coates, Toledo, Ohio; William A. Carson, Evansville, Ind.; George Whysall, Marion, Ohio; W. H. Bloss, L. G. Parker and S. D. Hutchins.

A. W. Brady, George Whysall, C. N. Wilcoxon, H. A. Nicholl, C. L. Henry and E. B. Peck

FIVE PAST-PRESIDENTS AND MR. WILCOXON, THE PRESENT EXECUTIVE OF THE C. E. R. A. THE SIXTH, W. S. WHITNEY, WAS ALSO PRESENT THE SECOND DAY OF THE CONVENTION

The association then listened to the paper by Mr. Broomall on "The Value of Standards to the Railway Industry," which appears in abstract on another page. Owing to the lateness of the hour and the further business to come before the association, President Wilcoxon requested that discussion on the paper be omitted.

The report of A. L. Neereamer, secretary-treasurer, was then read to the association and approved. An abstract of this report appeared in last week's issue of the JOURNAL.

The committee on nominations reported the following names for officers for the ensuing year, and the association gave them a unanimous ballot: President, C. N. Wilcoxon, president and general manager Chicago, Lake Shore & South Bend Railway, Michigan City, Ind.; first vice-president, F. W. Coen, general manager and purchasing agent Lake Shore Electric Railway, Sandusky, Ohio; second vice-president, John F. Collins, vice-president and general manager Michigan United Railways, Jackson, Mich.; and secretary-treasurer, A. L. Neereamer, Indianapolis.

The members of the executive committee appointed were as follows: F. D. Carpenter, Lima, Ohio, chairman; H. A. Nicholl, Sam W. Greenland, W. A. Carson, R. A. Crume, Frank R. Coates, E. J. Burdick, A. Benham, E. B. Peck, A. Oberding, W. H. Bloss and O. A. Small.

President Wilcoxon appointed the following committee on hotel arrangements: W. H. Bloss, chairman; S. D. Hutchins, L. G. Parker, and J. G. MacMichael. The joint folder committee, of which E. B. Peck of Indianapolis was chairman, was also continued.

Revival of Pure Wrought Iron*

The Author Discusses the Reasons for the Recent Return to Popularity of Wrought Iron in Railway Service

BY G. G. ROBERTS

Of Brown & Company, Inc., Chicago, Ill.

AMONG the vexatious problems with which practical railroad men are constantly confronted—probably outstanding all others—is that of breakage of various metallic parts of the operating equipment under the stress of working conditions. Fractures persist in occurring when, and often where, least expected, and far too frequently they occur with disastrous results.

For our purpose it will suffice to eliminate all except that insidious, progressive, structural derangement commonly known as "crystallization." This term, though hallowed by usage, is a misnomer, because the process of disintegration intended to be described by it is the opposite of crystallization. It is, in fact, the destruction of the crystalline form—the decrystallization of the metal. The condition is really a breaking down of cohesion, through motion, which causes the crystals by grinding upon one another to assume a more spheroidal or granular form in which cohesion, on account of the reduced area of contact, can be but inefficiently exerted.

Under practical working railroad conditions, three destructive forces are ever at work on the metal parts of equipment, namely, shock, jar and vibration, the latter being the effect of the other two. There is agitation, more or less violent, upon every crystal composing the metal, and since all are not of equal strength or cohesiveness, it would seem wholly plausible that the least efficient should yield. This usually occurs at or near the surface where cohesion ceases and the escaping vibratory waves exert their greatest force. From this point of incipient fracture the process continues toward the center, because the bottom of the fracture will have become the nearest point of exit and the least resistant, and the cleavage will progress transversely in a practically straight line until a sudden excess of strain completes the severance. Proof of this is the well-known fact that where a piece of steel is nicked or scratched fracture will always begin.

It should be borne in mind that all steels, of whatever kind, are crystalline in formation, and are, therefore, most susceptible to granulation.

In the effort to reduce breakage from this cause, the entire gamut of steels has been run with varying though unsatisfying degrees of success. Increasing the section or size merely tends to delay the date of final reckoning. The use of various foreign substances known as alloys, increasing strength and rigidity, serve only to retard the process and, perhaps, render more difficult the detection of incipient, or even advanced, fractures, and experience has shown that this class of material has not requited the hope inspired by its advent.

We thus are brought to consider the almost forgotten plebeian which has heroically done duty from remote antiquity, the commonest, basest—because most plentiful—the most useful of all the metals—pure wrought iron.

Pure wrought iron is a thoroughbred. It is fibrous, tenacious, ductile, uniform and, though not so strong as its lusty offspring, steel, its character will be shown to meet the difficulty of granulation by vibration more nearly than any other known material with anything like its availability. On the other hand, steel is a hybrid —a carbide of iron. It is strong, rigid, crystalline, friable, but it cannot withstand the shaking, the vibration, that iron can. However, as before stated, the question is not one of tensility, but rather of ductility, or, as it might be stated, conductivity.

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*Abstract of a paper presented before the Central Electric Railway Association at Indianapolis, March 8, 1917.

Load limit excepted, a steel of, say, 100,000-lb. tensility will withstand granulation better than one of 50,000 lb., but the evidence is that pure wrought iron of the lesser strength will survive far longer. As a matter of fact, the higher tensility as expressed in steel has been exacted in the false effort to combat granulation rather than because of its necessity in load carrying. True, a fibrous material of 100,000-lb. tensile strength would be highly desirable, but it cannot be had. About 50,000 lb. is the limit of pure wrought iron, which is the best expression of a fibrous metal. Beyond that we encounter the presence of a hardener or stiffener, and enter at once upon the domain of steel. When it shows below about 46,000 lb. we may expect to find adulteration affecting its purity, like scrap or residual deleterious constituents of the ore, which latter are ever present in the natural state.

Corrosion is another factor, aside from its own destructive effect, that leads to granulation by reduction of the metal to its natural state of ore. It is well established that pure wrought iron exposed to the elements in every-day working conditions is far less susceptible to corrosion than any steel. Instances are plentiful, as in the wrecking of old buildings, bridges and other structures. In general, this may be ascribed to galvanic action.

Iron, due to its greater phosphorus content than steel, is cathodic and the steel anodic when the two are brought into close contact. This accelerates corrosion in the negative element. The fact may readily be demonstrated by fastening steel plates with iron rivets. In a very short time the rivet heads will project appreciably and the steel plate will show excessive corrosion.

It should be said also that sudden changes of temperature have less effect on iron than steel, due again to the fibrous character of the former, as in the case of a locomotive piston rod passing from a hot steam chamber to perhaps 40 deg. below zero, which is always a more or less dangerous trial for steel. About the only objection to iron for this purpose (its softness causing seams to develop under the packing) has been due to carelessness in providing iron unfit for the purpose like piled or "busheled" iron, whereas for this and other like strenuous duty only the best pure wrought iron from hammered blooms should be used.

CHARACTERISTICS OF COMMERCIAL WROUGHT IRON

Bloom, piled and box-piled iron are terms that are properly used to express the various methods of making iron. All may be and are to-day made of various combinations of scrap or junk. Originally they referred only to pure wrought iron, but now they are carried along through the scrap heap and junk pile as catch phrases to entrap the unwary. Please bear in mind that now I am trying to describe pure wrought iron puddled wholly from new metal. "Common," "merchant bar" and like products have their uses, but not in high duty.

With this understanding, in the order of effectiveness the blooms come first, box-piled next, rerolled-piled next and straight-piled last. It is rather a fine distinction as to the proper application of each to its particular sphere, but speaking generally they represent what may be termed high duty, medium duty and low duty. They will show strength and durability in the order given.

Norway or Swedish irons are so-called, as indicated, from the regions of their origin, where ore is found containing all elements necessary to the production of good iron. Ore deposits in most other sections of the globe are lacking in the important red hematite. This, however, may be readily obtained in other sections and added to local ores. In addition to this, the Scandinavians are noted for conscientiousness in the production of their irons. However, in our own and other countries there are produced irons which, in many respects, excel the Norway or Swedish.

All forging metals have what is known as a critical point of heat usually expressed as "short." Thus steel is cold short and hot short, and must be worked at a red or medium heat—pure wrought iron, per contra, is red short, that is to say, when the directions of its fiber are to be changed, as in bending, punching or twisting, it should be white hot or black.

In this connection, it may be noted that the more carbon in the piece the lower the heat at which it can be worked, and the less the carbon the higher the heat, until the point of no carbon is reached as in pure wrought iron a white or "snowball" heat is best about 2200 deg. Fahr. Many blacksmiths, not knowing this law of metals or from force of habit or otherwise, persist in spoiling good iron by trying to compel it to work like steel at a red heat. It is significant that they do not attempt to work steel at a white heat, when it flows readily under the hammer.

In conclusion, to the gentlemen of higher authority in the railroad industry it may not be amiss to invite attention to the wisdom of the expression as applied to railroading, "the best is none too good." I am impelled to this remark by the not uncommon misconception of the term economy. Permit me to repeat, economy in the purchase of material is not necessarily represented in the number of pounds of material a dollar will buy, but rather by how much car mileage the dollar purchases. Pure wrought iron cannot be produced as cheaply as the steels which are ordinarily in competition with it, and upon this fact, perhaps more than upon any other, rests the cause of its partial, though temporary, eclipse.

This faithful old servant of man, this Rip Van Winkle of the metallic world, comes back not as a mendicant. not as its human prototype, incapacitated for further useful effort, but still imbued with all its lusty vigor. However, I am constrained again to say that the quondam stranger before us is not "any old iron," but pure wrought iron.

Railway Progress in Spain

The first annual report of the Barcelona Traction, Light & Power Company, Ltd., Barcelona, Spain, for the calendar year 1915, contains a special report dated Oct. 3, 1916, by H. F. Parshall, president of the Ferrocarriles de Cataluna, relative to the progress of construction and operation on the controlled tramway enterprises. In his opinion, the general tramway system in Barcelona, which is owned by the Tramways de Barcelone, a Belgian company, and is now managed and controlled by the Ferrocarriles de Cataluna, under an operating contract, has great possibilities of development, but this will necessitate a large expenditure if satisfactory results are to be obtained.

At the present time the tramways are being operated under several concessions with two gages of track, but a new concession has been granted by the municipality and is now before the government in Madrid for approval, under which the various concessions will be unified, the tramway system operated on one gage, and the lines extended into the outlying districts.

The Value of Standards to the Railway Industry*

The Author Outlines the Advantages That Obtain Through Reduced Costs and Simplified Maintenance of Standard Parts and Points Out That Standardization Does Not Bar Progress Because of the Possibility of Making Revisions When They Are Needed

By A. L. BROOMALL
Westinghouse Electric & Manufacturing Company

WHEN standards upset immediate plans, and force decisions contrary to those which seem to be the best for any specific case, one is inclined at the moment to feel that standardization is a handicap to progress and a waste of time and money. However, in nearly all instances a broad viewpoint will convince one that there is very little danger of too much standardization.

A great number of articles that are used almost daily have become standardized, thereby saving a lot of time and effort. For examples, the standard Edison lamp base, standard pipe threads, standard bolt threads, and the standard Brown & Sharp wire gage may be cited. One can easily imagine the inconvenience and loss of time brought about by even a small number of different types of lamp sockets, as well as the additional cost of manufacturing and selling lamps if the manufacturers and dealers were forced to carry a stock for two or three types of bases. If there was no standard gage for the railroads the additional time and expense required in handling freight and the personal inconvenience in traveling could not be estimated.

There is nothing new about standardization, but the need of it now is greater than ever before, because of the greater use of tools, jigs, and automatic machinery in manufacturing. It is particularly desirable wherever pressed steel parts are used, because the tools for forming pressed steel are expensive as compared to the cost of patterns for castings, and when these tools are once made they will last almost indefinitely. Stating this in another way, when standards are adopted and followed, manufacturers will then feel that they can afford to provide their shops with more elaborate tools —even in spite of their greater cost.

Standardization consists in laying down a definite plan as a guide for all future development, thereby eliminating small steps and insignificant differences in dimensions and materials. It may be divided into three general types: standardization of dimensions, standardization of materials, and standardization of processes.

STANDARDS REDUCE COSTS

Primarily, the adoption of standards permits the manufacturers to build in larger quantities, which in turn means production at less cost, thereby enabling the railways to purchase at a lower price. When small quantities are handled the time to set up the tools for many operations adds a large percentage to the cost of actually performing the operation. The workman who performs the same operation day after day becomes skilled in handling that special operation, but on the other hand if the operation is changed every few days it is necessary for him to spend time studying drawings or other instructions, changing tools and asking questions of his foreman, all of which reduces his output and adds to the cost.

A good illustration showing the difference between the cost of a standard and a special article recently came to my attention: Requests were made from several steel companies for quotations on two grades of steel which would have practically the same physical characteristics. One steel was standard with the steel manufacturers, while the other steel was very special, both as to material and the method of handling. The price quoted on the standard steel was 8 cents per pound, while the price quoted on the special material was approximately 30 cents per pound. This great difference in cost was largely due to the fact that to have produced the special grade of steel, the steel manufacturers would have been required to have upset their regular scheme of production, causing delays in the manufacture of their standard steel and thereby increasing the cost of it also. The actual cost of the material and labor on these two steels if manufactured under the same conditions would have been approximately the same.

I am informed that Mr. Carnegie once said, "We will roll the standard shapes of structural steel and allow our competitors to make the special shapes," thereby implying that he would rather lose the business than handle the special material.

The selling price of the leading types of automobiles has been gradually reduced as the output has been increased. In the automobile trade production has been on such an extensive scale that the manufacturers could afford to equip their shops with the very best tool equipments, and by standardizing all their processes could enable their men to work most efficiently. The manufacturer of apparatus for the railways can hope only to approach the conditions in the automobile trade by a standardized product. But first the railways and manufacturers must mutually agree on standards, so as to eliminate requests from the railways for articles which the manufacturers are not prepared to furnish. The American Electric Railway Engineering Association standards serve as the medium through which this is being accomplished.

When these come into general use the delivery to the railways of all parts that are standardized will be improved, since the manufacturers of both raw material and finished apparatus will have more assurance as to the probable desires of the railways and will therefore provide for the manufacture of the standard parts in quantities as well as carrying an available stock. Also in the case of several railways that are united to form a large system the maintenance problems will be greatly simplified if all the individual roads have in the past followed the association standards. In this case many of the detail parts of the equipment may be interchangeable, and at least the variations in size will be such that the parts will perform different classes of service.

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*Abstract of a paper presented before the Central Electric Railway Association at Indianapolis, Ind., March 8, 1917.

The interurban railways which now interchange cars will be particularly benefited by the more general adoption and use of standards. Repairs can then be made more easily to cars from other divisions or even to cars from other roads, not only on account of having interchangeable parts, but because the men will be more familiar with the methods of handling the apparatus.

STANDARDS CAN BE CHANGED

However, standardization is an ideal. The work can never be finished because the art will develop from time to time, and to suit the new conditions the standards must be changed or new standards added. For this reason a standardization committee must be always at work reviewing existing standards and suggesting new ones. As an illustration, in 1907 the Engineering Association adopted standard axles that gave wonderfully satisfactory results until the small, lightweight, ventilated motors were introduced. It was undesirable to put these motors on any existing axles, as the minimum standard at that time was 4½ in. in diameter, and since the new motors are very short along the axle, if they had been located according to the existing standards the axle collar required would have been nearly as long as the motor. It was therefore necessary in 1916 to add two new axles to the list and to make a few minor changes in the old standard axles.

Previous to the time of adopting the association standard axles there had been no plan to which any of the manufacturers or railways were working. Each individual, in designing the axle or motor, was allowed to use his own judgment, so that an enormous number of axles were being made, each one differing only slightly from some other. In many cases, if an axle had been made for a certain type of motor a different motor could not be used. There was often confusion as to the type of gear key desired, and the location of the motor on the axle. Axle drawings were frequently sent to the motor manufacturer to have the location of the motor on the axle approved, and, altogether, a lot of expense was involved by the railways and manufacturers in fitting motor, axle and detail parts together. It is needless to say that a great number of errors and delays occurred because of some misunderstandings or mistakes in reading drawings.

After the standard axles were adopted, it became a simple matter to check up the application of any given motor to one of the standard axles. It is now unnecessary to refer the drawings of standard axles to the motor manufacturer, since the axle is completely identified by giving its number. The correspondence required has been greatly reduced, and nearly all the errors of application of the motor to the axle have been eliminated. I have looked at the advantages of the standard axles from a motor manufacturer's standpoint, but I am sure that the railways, as well as the truck builders, have felt the great benefit that was derived by having this one part of the car equipment standardized.

Carbon brushes, which have not been standardized, but which soon will be, illustrate so well the conditions that exist when there are no standards to guide the designer, and show so clearly the great advantages to be derived by having standards, that I will give you in a few words the history of the case.

Formerly, railway motor brush holders of different manufacturers required carbons having different tolerances from the specified dimensions. This meant that a carbon, say, 1½-in. x 1½-in. was not interchangeable in motors of different manufacturers, even though they both used carbons of the same nominal size. The tolerances permitted were also different for industrial and railway carbons. By joint action of representatives of the Electric Power Club, the American Electric Railway Association, the carbon-brush manufacturers and the manufacturers of electrical machinery the same tolerance from specified dimensions has been agreed upon for carbons of all electrical machinery. In the future, when ordering carbons, it will be necessary only to specify the size and grade of carbon desired. Previous to the adoption of these standards it was necessary to specify the type of motor on which the carbon was to be used.

This cannot but greatly simplify the handling of carbon brushes and will be of great benefit to the electric railways, the carbon-brush manufacturers and the motor manufacturers. The adoption of this universal standard will permit the carbon-brush manufacturers and motor manufacturers to reduce the number of machining fixtures and gages required, and will permit them to carry a much larger available stock of carbons ready to ship. The possibility of errors has been greatly reduced, which in turn will eliminate many complaints and much letter writing. All of this tends to reduce the price of carbons, but as it has actually worked out it will permit the carbon-brush manufacturers to furnish a carbon with reduced tolerances from the specified dimension at about the same price. The electric railways will now obtain better carbons, more prompt shipment, and in many cases carbons which are interchangeable on several types of motors.

I have explained only two cases in detail, but I am sure that many of the other standards that have been adopted have been as beneficial. Standardization has for its ultimate object greater economy, and standards are good so long as they represent economy. Standardization can be overdone, but as a check on this, if the sacrifice in any given design in order to follow standards is too great, they will probably not be followed. In the same way it may be wrong to adhere to a standard when by neglecting it a far superior design can be made. For instance, some years ago 30-in. and 33-in. wheels were standard for city cars. Then the 24-in. wheel for low-floor cars was brought out. This, of course, required motors, trucks, car bodies, etc., quite different from the then existing standards. However, the small wheel has proved so satisfactory, I am sure we will all admit that it was a distinct advance in the art, and, therefore, a new standard was justified. It has, however, added to the cost of producing equipment; by this I mean that manufacturers of trucks, wheels, car bodies, motors, etc., are now forced to build apparatus to suit several sizes of wheels. Let me state this in another way: If all city cars used only 24-in. wheels, then the cost of the cars, including equipment, could probably be greatly reduced over what it is at present, under conditions where it is necessary to produce cars and equipment for several sizes of wheels.

STANDARDIZING PROCESSES

There is another type of standardization by which the railways could accomplish much in their own organizations. I refer to standardizing their processes. By this I mean having written rules or processes for many of the operations performed in inspecting and maintaining equipment. It is almost impossible for the man in charge to be sure as to the exact process that is being followed in the repair shop on the great number of simple operations that must be performed, such as babbitting bearings, banding armatures, repairing commutators, etc. Written rules will do much toward standardizing these operations. It will also teach the young workman the correct process to be followed.

It may require time and effort to develop a process, but this, when once developed, will thereafter go along automatically. By the simple act of writing down rules better methods of performing each operation which otherwise would not be suggested will often occur. Most repair shops have worked out the various processes with satisfactory results, and from there on the information is passed along verbally from workman to workman, with the result that many important details are forgotten. The above is a type of standardization that is rarely referred to, but I believe it could be used to great advantage on many railway properties.

If standardization work is to be of value to the industry, we must all do our best in helping the standardization committee in its work, and when a standard is adopted, we must in every way possible strive to make use of that standard. There are cases when it is impossible to use the adopted standard on account of some special local conditions, but in this case the railways should adopt a design which differs as little as possible from the standard and they should work with the object in view that ultimately changes can be made in all details and actual standardization effected.

Office Routine and the Planning System

An Article Supplementary to One by F. P. Maize, Master Mechanic Portland Railway, Light & Power Company, Appearing in the 1916 Maintenance Issue

By H. C. BRUMBAUGH

Chief Clerk, Mechanical Department, Portland Railway, Light & Power Company, Portland, Ore.

NOWHERE is the need for a simple but comprehensive office system more apparent than in those shops in which there is a planning system. Without a suitable office organization and routine, well balanced and with the several functions co-ordinated, any planning system will operate with extreme difficulty or fail altogether regardless of the merits of the plan itself. In the issue of the ELECTRIC RAILWAY JOURNAL for March 18, 1916, F. P. Maize, master mechanic of this company, described in detail the planning system which had been installed a short time previously in our shops. The purpose of the present article is to present what might be called a progress report on the same subject, and to elaborate somewhat the detail of the office end of the system.

The office may be likened to a power plant. When all is running smoothly, with the working parts carefully watched and tended, the whole system is satisfactorily energized. When there is trouble at the power plant, friction results and gaps appear in the service. If the trouble is not soon located and eliminated the whole system is demoralized. Like the planning system itself, the office end of an electric railway repair shop operated under a planning system is different from almost any other enterprise, although the underlying principles are the same. To produce the desired results, such an office should be divided in its functional organization into three main sections, namely, the planning department, the accounting department and the statistical department.

In the planning department the following functions are performed: The planning, routing and following up of all work done in the shops; the obtaining and distribution of all material and tools; the preparation and distribution of instructions and orders; the receiving and reporting of reports from workmen when beginning or leaving jobs, and the keeping and reporting on the costs of the jobs.

The functions of the accounting department are to extend time cards; to enter, prepare and balance payrolls; to determine the proper operating accounts to which the different jobs are chargeable, and to prepare recapitulations of all shop jobs, giving the distribution to the different ledger accounts of all labor and material expended.

The duties of the third division, that on statistics, include the recording of all changes of parts of equipment; the keeping of data cards of equipment owned; the recording of the mileage made by each car daily; the keeping of individual records of all parts of equipment, showing dates of application and removal; the mileage made while in service, and the name of the responsible workman, and the compilation of all periodical reports.

At first glance it may be difficult to see why all of these functions are necessary and how they can be brought into working relationship with each other. Experience in the shops of this company has shown that not only is it feasible but that it is absolutely necessary for the proper planning of shop activities.

DEVELOPMENT OF THE OFFICE SYSTEM IN THE PORTLAND SHOPS

About ten years ago when the writer first became identified with this company the office force of the mechanical department consisted of one clerk. His duties were to answer the telephone, check time slips, write the few letters necessary and issue orders for any special work to be done in the shops. No orders were issued for the routine car work.

Each workman was furnished with a time slip, with the operating accounts printed thereon, and at the end of the day he was expected to put down as many hours opposite each of the accounts as he remembered having worked on during the day. His principal care was to see that the total was ten hours. The only accounting done in the department at that time was thus performed by the mechanics themselves. Records of changes of the principal parts of equipment, such as armature or wheels, were kept in a haphazard manner. Although mileage on the cars was kept at the general office of the company, it was utilized principally by the auditor in the preparation of his financial statements and reports and was very seldom referred to by anyone in the mechanical department.

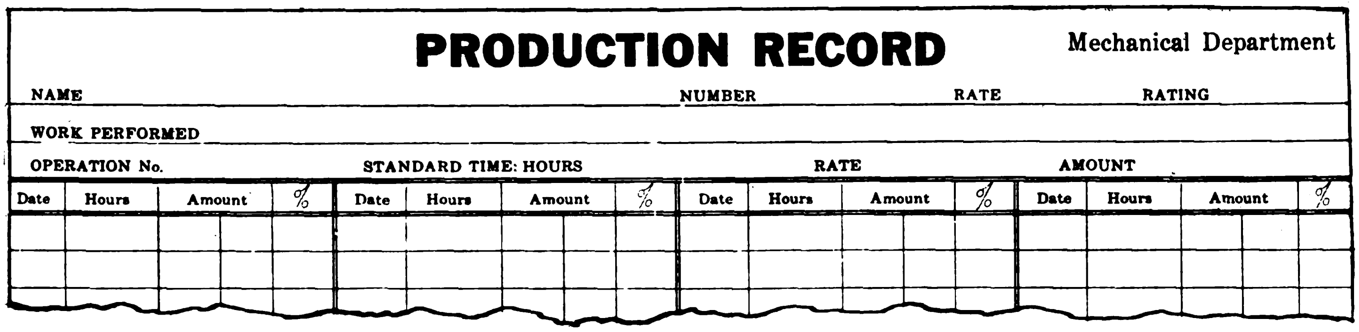
The first improvement consisted in the installation of a complete system of records of all changes of all parts of equipment. As a consequence the frequent use of the mileage records for the purpose of determining the relative merits of material naturally followed. This added a great deal of clerical work and necessitated the addition of one clerk.

The next step was to change the time slip system so that the responsibility for the distribution of shop labor to the several operating accounts would be placed on a clerk familiar with the accounting system. A time card was devised with space for the workman to write in detail a description of the work he had performed during the day, and a column for the time worked on each job. The clerk with this information was enabled to classify the work and distribute it to the proper accounts.

The above plan had been in operation but a short time before the head of the department began to ask for details in comparing the monthly statements of operating expenses with similar figures for the previous year. He also desired from the mechanical department office an explanation of any increases or decreases in the amounts of expenditure. To supply this information required the accumulation of considerable data and, as the correspondence had been increasing for some time also, a combination stenographer and statistical clerk was added to the force.

Shortly after this innovation the present master mechanic took over the management of the department, and from that time dates the real progressive development of the office system. The result was that when the time came to inaugurate the planning system, described in the article referred to, the change was effected overnight and without disorganizing either the office or the shop forces. With the introduction of new shop methods the office records became more and more important, and the necessity for centralizing all of the clerical work pertaining to the mechanical department in the departmental office became apparent. The mileage clerk, with all of his records, was moved from the general office to the mechanical department office, and the payroll clerk soon followed. Overhauling of equipment was started on a mileage basis, and the mileage made by parts of equipment was used to determine the relative merits of material and the quality of the work performed by the shop men.

The need of data regarding comparative costs was soon developed, and a fourth clerk was added to the office force. A crude cost system was first installed, which was gradually improved upon as the need developed. This was the real beginning of the planning department, insofar as the office was concerned. For the endeavor that produced reliable and active cost data resulted in the endeavor to standardize working methods.



PRODUCTION RECORD Mechanical Department

NAME NUMBER RATE RATING

WORK PERFORMED

OPERATION No. STANDARD TIME: HOURS RATE AMOUNT

Date	Hours	Amount		%	Date	Hours	Amount		%	Date	Hours	Amount		%	Date	Hours	Amount		%

HEADINGS OF RECORD CARDS USED IN DETERMINING THE EFFICIENCY OF WORKMEN IN PORTLAND (ORE.) SHOPS

From the above it will be seen that all the essentials for intelligent management of the shop were provided. The mileage record furnished the basis for the bulk of the shop work, the overhauling of equipment, and gave a graphic picture of the quality of materials and workmanship. The records of changing of parts of equipment fixed the responsibility for work performed and furnished a check upon the mileage records. The cost data gave the time and cost of the work, and furnished the basis for determining the efficiency of the workman. The monthly statistical reports showed every phase of the shop activities in condensed and tabulated form. As a consequence of this preparation the transition to the real planning system was easy in so far as the mechanical operation of the system was concerned.

The details of the change to the planning system and the development of this system itself were fully described in the article in the ELECTRIC RAILWAY JOURNAL already referred to and need not be repeated here. However, it may not be amiss to describe one important development of the system which has been put into effect since the publication of the article. One of the primary objects of any system of so-called "scientific management" is to determine the efficiency of the individual workman, then to endeavor to increase this by making his compensation contingent upon and commensurate with the efficiency attained. To this end we have for the past two years been making a careful study of time records on any operation pertaining to our standard work. We have succeeded in a great many instances in establishing standard time for the performance of the operation. We have also for some time past considered certain rates of pay standard for certain kinds of work. With this information, that is, standard time at a standard rate, we have developed a system for gaging the efficiency of the workman.

For this purpose we use a card record form, 5 in. x 8 in. in size, with the printing shown on the accompanying illustration. It will be noted that the card gives the workman's name, his number, his rate, a description of the work performed, the operation number, the standard time, the standard rate and the standard amount. Columns are provided for the entry of the date, the time taken, the amount of money involved and the percentage of the time taken to the time allowed. In the heading of the card is also a space for "rating." This is obtained by dividing the workman's rate by the standard rate. It indicates by the resulting percentage the average of time it must take him to perform this particular work if he is to be considered 100 per cent efficient.

As an example, suppose that a workman's rate is 45 cents per hour and the standard rate is 50 cents per hour. His rating is then obtained by dividing forty-five by fifty; that is, it is 90 per cent. If the average of the percentage column is ninety, the workman is said to be 100 per cent efficient. If the average happened to be eighty, the workman is only 88 per cent efficient. This method has the merit of being absolutely fair both to the workman and to the employer, as it takes into consideration the time element and the cost element.

Whatever scheme of compensation may be adopted, whether it be a task and bonus system, a profit-sharing system on a percentage basis, or a straight day's pay based on the workman's value to the employer, it is certain that the application of this principle will result in the workman receiving just compensation for his services based on a scientific determination of his value. His compensation will not depend on the opinion of his foreman, who may, consciously or unconsciously, be prejudiced.

Regulating Materials and Supplies

Pittsburgh Railways' System, Similar to That Used for 90 Per Cent of Steam Railroad Mileage, Is Economical and Efficient—Plan Is Based on "Stock-Book" Record and Monthly Count of Stock on Hand, with Data as to Orders and Receipts

By B. J. YUNGBLUTH
General Storekeeper, Pittsburgh (Pa.) Railways

WITH the constantly increasing prices of material, the rising cost of labor and the more exacting service demands from the public, economy in the electric railway industry is to-day more necessary than ever before. Electric railways invest large sums of money in unapplied materials and supplies, and appreciable savings can be made in connection with the regulation of such items if useless red tape is eliminated.

The regulation of materials and supplies even in normal times requires a well thought-out plan which shall be adequate and yet not expensive. Many electric railways, however, have not given the matter sufficient thought, and are continuing such records and systems as were in use when horse cars were operated. This phase of operation is about the only one which, generally, has not kept pace with the rapid development of the art of transportation. The operating units are now so much more extensive than the early city passenger railway that the methods now must be broader and more efficient.

DISCREPANCY BETWEEN STOCK AND RECORDS IS NATURAL

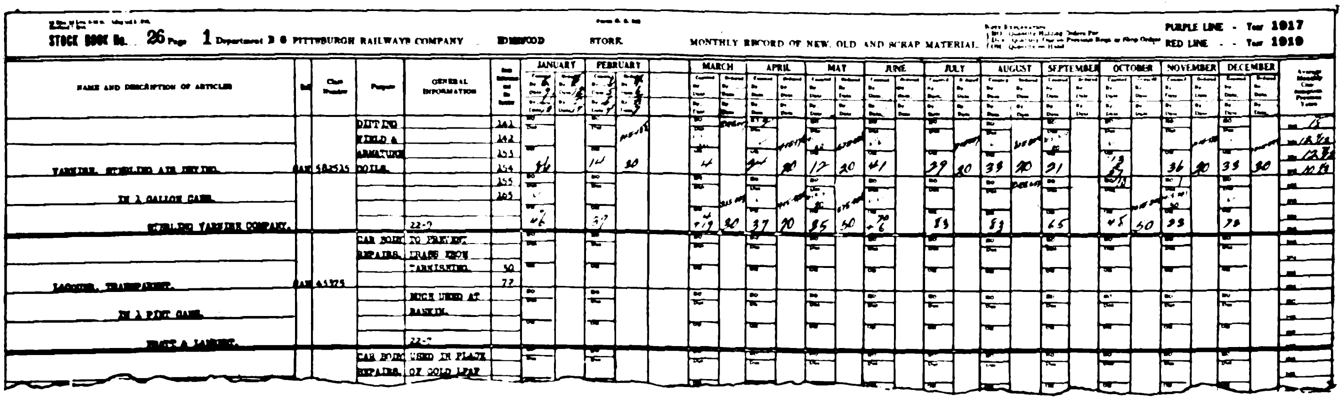
The problem of electric railway stock maintenance and stock records generally is not wholly unlike that in a department or other large retail store. I venture to say that if a department store were to attempt an accounting of every item of stock as most electric railways are doing it to-day, it would increase the expenses of operation to such an extent as to make the business unprofitable. This feature of electric railway operation is only an incident, or the same thing would result. It is easy to understand that in operating a store of any kind errors will be made in weights, measures, descriptions, prices, etc., so that at the end of, say, a year, some discrepancies will exist between the stock actually on hand and that shown by the books. No grocer ever retailed sugar from a barrel and got from it just exactly what the barrel actually contained. This is a natural condition and cannot be entirely overcome even with extreme care.

Suppose that these discrepancies in a railway storeroom amounted to one-quarter of 1 per cent of the stock handled, or, say, $2,000 a year. Would the company be justified in establishing a system of records costing $2000-$3000 to enable it to know on what particular items the error occurred? The system would not reduce the number of errors. In fact, it would increase them, because in handling a large volume of clerical work, errors must be made which would have the same effect as if the material were incorrectly handled. Yet many companies are to-day doing exactly this, *i.e.*, maintaining ledgers or perpetual inventories that cover each of the 5000 to 10,000 items which are carried in stock. They show, for instance, that 437 1/16-in. x 1½-in. spring cotters (value, 11 cents) were purchased; that these were issued in lots of from ten to one hundred, and that when all were used seventeen more or less had been given out than were purchased—the difference in value being 1 cent.

RECORDING SYSTEM IS OFTEN MORE EXPENSIVE THAN DISCREPANCY

The cost of recording such matters in infinite detail on the ledger basis amounts in many cases to more than the actual value of the material itself. Yet some railways go to the extent of maintaining a triplicate record —bin cards, a ledger at the store and another ledger in some other office, each covering essentially the same details. One company requires that each entry on the ledger be checked by two different clerks. In many cases these records disagree with one another and all of them disagree with the stock. Usually if it is desired to know absolutely the amounts of material on hand at a given time, the records are not consulted, but a count of the actual material at the time is resorted to. This, of course, is the only way to get information that is absolutely correct. The accounting for materials must not be confused with stock regulation.

Illustrating this condition, a general manager tells how his engineer of way one morning informed him that some ties should be purchased at once for immediate delivery, there being not enough on hand to complete the work for the next thirty days. Reference to the record showed that there were plenty of ties on hand—



PITTSBURGH RAILWAYS—SPECIMEN PAGE FROM STOCK-BOOK RECORD in fact, enough to complete the year's work. On account of the conflicting statements, an actual count of the ties on hand that day was made. The records were found to be wrong, and some ties had to be secured at once. If the accounting for the use of the ties was wrong and the jobs on which they were used were not charged properly, that was a matter of grave concern in itself; but to allow the stock of ties to run down to such an extent, owing to the same error that produced the other condition, was a catastrophe.

HOW STEAM RAILROADS HANDLE THE PROBLEM

Recognizing this fact, the steam railroads, which perhaps have invested more in materials and supplies than any other industry in the country, years ago adopted a plan for recording stock that is being used as a standard on possibly 90 per cent of the mileage in this country. This plan has the approval of the Railway Storekeepers' Association, which is made up of men who are at the head of the business of handling stocks of material. The basic idea of a stock-book record was originally conceived in 1887 by S. F. Forbes, then general storekeeper of the Chicago & Northwestern Railroad. With various improvements from time to time it has been in use continuously since then.

The stock-book plan attacks the problem from just the opposite angle. Instead of providing a ledger which shows each item removed from stock as a credit to the amount previously on hand, the plan contemplates an actual count each month of all the materials on hand, together with information as to what had been ordered and received. The amount on hand this month, deducted from the amount on hand and received the previous month, equals the issues during the period. Stock regulation must be based upon knowledge of issues during various periods in the past, plus one's knowledge of other conditions and circumstances which affect the future demand. Only three entries are necessary for this information, as compared with a great number of entries where each individual issue is recorded.

MONTHLY COUNTING OF STOCK IS NOT STUPENDOUS OR COSTLY TASK

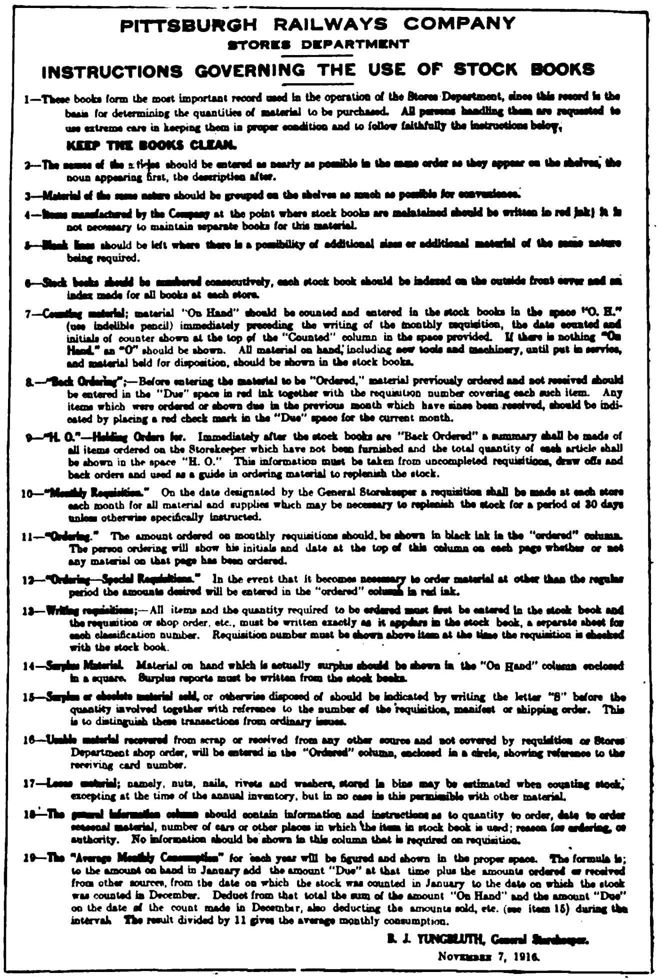
At first thought it seems to be a stupendous task to count the stock each month. Nearly every one expresses himself so upon first hearing of the idea. With material kept in proper shape, as it should be regardless of the record that is kept, the work of counting a stock valued at $600,000 costs $100 a month. Compared with the cost of running a ledger record, this amounts to about 20 per cent. The facts as they are arranged are so condensed that a glance is sufficient to read the record for a year. It closely approximates a graphic chart.

Since with the stock-book plan it is necessary for the storekeeper to give his attention each month to each and every item of stock in order to ascertain whether it will be necessary to order material for replenishment, the fixed minimum-and-maximum scheme, which has proved itself during times of retrenchment and times of prosperity to be wholly inadequate, is not used. If they are to be reliable and actually serve their purpose, the figures for minimum and maximum must be corrected so frequently to keep pace with the changing conditions, that it is better to have a capable man determine the facts each month.

HOW THE PITTSBURGH RAILWAYS USE THE PLAN

Our stores are apportioned with one stock clerk in charge of each section. The stock clerk, one of whose duties is to count all his stock each month, must necessarily become more familiar with the stock and take a greater interest in determining its condition, what is active, what is sluggish and what is obsolete, all of which compels him to work more intelligently. At the same time it does not require a man of any higher caliber than is usually employed at such work. The counting of our stock is done at a regular period each month. Beginning the first of the month, the counting must be completed by the twelfth. During the interval, the stock clerks must perform their regular duties the same as at all other times.

Errors in counting are sometimes made, of course. One of the points of strength of this record is that such errors need not stand indefinitely. At the time of each count, the storekeeper has an opportunity to detect them when going over the books to order what is necessary to replenish the stock, or the stock clerk himself corrects them at least in the following month.



PITTSBURGH RAILWAYS COMPANY

STORES DEPARTMENT

INSTRUCTIONS GOVERNING THE USE OF STOCK BOOKS

1—These books form the most important record used in the operation of the Stores Department, since this record is the basis for determining the quantities of material to be purchased. All persons handling them are requested to use extreme care in keeping them in proper condition and to follow faithfully the instructions below,

KEEP THE BOOKS CLEAN.

2—**The names of the articles** should be entered as nearly as possible in the same order as they appear on the shelves, the noun appearing first, the description after.

3—**Material of the same nature** should be grouped on the shelves as much as possible for convenience.

4—**Items manufactured by the Company** at the point where stock books are maintained should be written in red ink; it is not necessary to maintain separate books for this material.

5—**Blank lines** should be left where there is a possibility of additional sizes or additional material of the same nature being required.

6—**Stock books should be numbered** consecutively, each stock book should be indexed on the outside front cover and an index made for all books at each store.

7—**Counting material**; material "On Hand" should be counted and entered in the stock books in the space "O. H." (use indelible pencil) immediately preceding the writing of the monthly requisition, the date counted and initials of counter shown at the top of the "Counted" column in the space provided. If there is nothing "On Hand," an "O" should be shown. All material on hand, including new tools and machinery, until put in service, and material held for disposition, should be shown in the stock books.

8—**"Back Ordering"**;—Before entering the material to be "Ordered," material previously ordered and not received should be entered in the "Due" space in red ink together with the requisition number covering each such item. Any items which were ordered or shown due in the previous month which have since been received, should be indicated by placing a red check mark in the "Due" space for the current month.

9—**"H. O."—Holding Orders for.** Immediately after the stock books are "Back Ordered" a summary shall be made of all items ordered on the Storekeeper which have not been furnished and the total quantity of each article shall be shown in the space "H. O." This information must be taken from uncompleted requisitions, draw offs and back orders and used as a guide in ordering material to replenish the stock.

10—**"Monthly Requisition."** On the date designated by the General Storekeeper a requisition shall be made at each store each month for all material and supplies which may be necessary to replenish the stock for a period of 30 days unless otherwise specifically instructed.

11—**"Ordering."** The amount ordered on monthly requisitions should be shown in black ink in the "ordered" column. The person ordering will show his initials and date at the top of this column on each page whether or not any material on that page has been ordered.

12—**"Ordering—Special Requisitions."** In the event that it becomes necessary to order material at other than the regular period the amounts desired will be entered in the "ordered" column in red ink.

13—**Writing requisitions**;—All items and the quantity required to be ordered must first be entered in the stock book and the requisition or shop order, etc., must be written exactly as it appears in the stock book, a separate sheet for each classification number. Requisition number must be shown above item at the time the requisition is checked with the stock book.

14—**Surplus Material.** Material on hand which is actually surplus should be shown in the "On Hand" column enclosed in a square. Surplus reports must be written from the stock books.

15—**Surplus or obsolete material sold**, or otherwise disposed of should be indicated by writing the letter "S" before the quantity involved together with reference to the number of the requisition, manifest or shipping order. This is to distinguish these transactions from ordinary issues.

16—**Usable material recovered** from scrap or received from any other source and not covered by requisition or Stores Department shop order, will be entered in the "Ordered" column, enclosed in a circle, showing reference to the receiving card number.

17—**Loose material**; namely, nuts, nails, rivets and washers, stored in bins may be estimated when counting stock, excepting at the time of the annual inventory, but in no case is this permissible with other material.

18—**The general information column** should contain information and instructions as to quantity to order, date to order seasonal material, number of cars or other places in which the item in stock book is used; reason for ordering, or authority. No information should be shown in this column that is required on requisition.

19—**The "Average Monthly Consumption"** for each year will be figured and shown in the proper space. The formula is; to the amount on hand in January add the amount "Due" at that time plus the amounts ordered or received from other sources, from the date on which the stock was counted in January to the date on which the stock was counted in December. Deduct from that total the sum of the amount "On Hand" and the amount "Due" on the date of the count made in December, also deducting the amounts sold, etc. (see item 15) during the interval. The result divided by 11 gives the average monthly consumption.

R. J. YUNGBLUTH, General Storekeeper.

NOVEMBER 7, 1916.

PITTSBURGH RAILWAYS—INSTRUCTIONS FOR THE USE OF STOCK-BOOKS

Since our stock is counted between the first and twelfth days of each month, our requisitions on the purchasing agent, except specials which cannot be anticipated, are made within a period of ten days, between the fifth and fifteenth. All material of a like nature is, therefore, ordered at one time, enabling the purchasing agent to place his business on a quantity basis with consequent advantages over buying small lots of the same kind of goods every few days.

The time of making the count and of ordering the goods to replenish the stock may, of course, be varied to suit the requirements. At one time we did count a portion of the stock each week, so that at the end of the month all of the stock had been covered. The plan will lend itself readily to any change of this nature that might be found desirable on account of local sentiment.

With this form of record an annual inventory is taken as of one certain date. This work, which is done under the supervision of the auditor, has repeatedly been performed for a stock of $600,000, without employing additional help or without working extra hours, in three and one-half days. The inventorying, therefore, is absorbed along with the other work and costs practically nothing, while the inventory plan used to keep the ledger record in balance would consume the time of two men all year long at a cost of not less than $2,000. We have had this plan in use at our stores since 1910. The results have been eminently satisfactory.

EXPERIENCE OF A SMALLER STORE

The statement of the performance at one of our smaller stores might be of interest to some of the smaller companies, which do not have such large stocks of material. In 1909, before using the stock-book record, at this particular store the amount invested in material and supplies was $35,000, with monthly receipts and disbursements of about $10,000. The second year after the record was used at the same store, we were operating with a stock valued at $29,000, while at that time we were disbursing an average of $14,000 per month. Therefore, the disbursements increased 40 per cent, while the stock on hand was reduced about 17 per cent. If we were operating under the same conditions as in 1909 in the later year, an increase in the investment of nearly 40 per cent would have been justified on account of the increased disbursements. Therefore, our stock investment had actually been reduced $20,000, the saving on which at 12 per cent was $2,400 a year; (12 per cent is figured as the cost of carrying a stock of materials and supplies, considering the interest on investment, risk of obsolescence, cost of storage and handling, rents, etc.) Our total pay roll for the year at that particular store amounted to $1,860.

A few days ago, after having discussed this subject with the general storekeeper of one of the large properties of the East, I was told that the plan was a radical departure from his practice, being different from anything he had heard of previously. He said, however: "The plan is unquestionably worthy of study; I am glad I heard of it, because I would not want our general manager to ask my opinion without being fortified with the facts."

Presented, herewith, is the form of sheet used for the stock-book record, together with a set of instructions covering its use. Sample items have been recorded on the form as an illustration. The sheets are written on the typewriter and afterward bound into units of twenty-five pages, which make a thin, flat opening book very convenient to handle.

Laborers and Contentment

In these days of great demand for labor in the industrial plants it is next to impossible to keep men on track maintenance and construction work, and it becomes essential that cognizance be taken of some of the things which go to make labor contented to stay on the job in the face of the $6 a day offers from the neighboring foundries. There are a few things other than the daily wage which enter into the inventory of requirements for the contentedness of even the "hunkies" and "wops"—for example, the camp they live in and the food they eat. Last year the president of one of the principal electric railway properties of the country was out over the line and happened to be at the location of the camp of a large track maintenance gang at noon time. Out of curiosity, we presume, he climbed into the box-car quarters and took dinner with the rest. The laborers, of course, were nonplused. There were flies by the thousand and the food was not palatable.

The president went back to his office and next day issued orders that the cook should be "fired" and screens provided for the doors and windows. He saw to it that a young fellow who also acted as timekeeper, should be made commissary because he would take pride in the provisions for the men. The new cook got the spirit of the change and the laborers made evident their approval of the better food and surroundings. And what was the result? A feeling of interest in their president and of contentment with their job was engendered such as is measured only in substantial returns to the company. While it may not be expected that many presidents will commune with democracy to the extent of our example, yet is it not worth while to make the living conditions of the laborers such as will breed contentment and make less luring the higher wage but uncertain industrial jobs?

One-Man Operation*

The Author Discusses Present Opinion on One-Man Cars and Advocates Their Extended Use to Forestall Future Automobile Competition

BY RAYMOND H. SMITH
Vice-president Eastern Wisconsin Electric Company

AN inquiry recently made among forty-eight companies operating one-man cars reveals the fact that one company began this mode of operation in 1895, two in 1901, one in 1906, three in 1910, three in 1911, four in 1912, nine in 1913, eleven in 1914, twelve in 1915, and two in 1916. These cars, in about 95 per cent of the cases, replaced cars operated with two men.

The answers also indicate that in a great majority of the cases one-man cars have been resorted too merely because of their appeal to the business judgment of the railway operators, and not because of jitney competition. Apparently the one-man car has not developed any new class of accidents, and it is generally conceded that the undivided responsibility of the motorman is conducive to the reduction of accidents. The absence of the second man to secure witnesses in case of accident is not regarded as important.

As to the bug-bear, public opinion, it appears that thirty-six companies report public opinion to be favorable; two companies report the public prefers one-man cars; four report no complaints; three report some objection at first which has now disappeared; two report the public indifferent; one that the public tolerates this kind of operation; and one company reports that the public is opposed to it. To another set of questions a favorable attitude is reported by thirty-six companies; five companies report the public as indifferent and eleven companies report "no complaint." Criticism at first, which later changed to approval, is reported by eleven companies, while opposition is reported by five companies.

In the last-mentioned inquiry, a population of less than 10,000 was reported by thirteen companies, and a population above 10,000 was reported by thirty-four companies. The maximum population was 68,000, and the minimum 10,000. Jitney competition was reported by only three companies.

Although a number of companies use dead-man's handles, this is not generally regarded as necessary. The question of providing a seat for motormen depends largely upon whether air brakes are used. In one inquiry air brakes are reported by nineteen companies, hand brakes by forty-five companies and magnetic brakes by two companies. In another inquiry thirteen companies report air brakes, while thirty-four companies use hand brakes.

The use of fare boxes is reported by fifty companies, nine companies report the registration of fares, and twenty-three companies report collecting fares under the pay-as-you-enter system. In another inquiry thirty-six companies out of forty-nine report the use of fare boxes.

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*Abstract of a paper presented at a meeting of the Wisconsin Electrical Association, Milwaukee, March 15, 1917.

In twenty-five cases it is reported that motormen are permitted to start car before collecting fares, and in twenty-four cases this is not permitted. It would seem that the best practice in this regard must be determined by conditions. What would be bad practice in a congested district might be considered good practice in districts where the street traffic is light.

There has been practically no objection on the part of the motormen to performing the duties imposed. Nineteen companies report that motormen receive a slight increase in wages, while twenty-eight companies report no increase.

As to flagging steam railroad crossings, nine companies report having flagmen at these crossings; nine companies report the flagging of crossings by the motormen; two companies use special derail and six companies report the adoption of a safety stop. From another inquiry it appears that flagmen are employed by seven companies, flagging the crossing by the motorman is reported by nineteen companies; derail is used by two companies, while merely bringing the car to a stop and observing that the crossing is clear is reported by thirteen companies. The writer is of the opinion that where an unobstructed view of the track may be had in both directions, ample safety is secured by the motorman flagging the car and that one-man responsibility at a railroad crossing is preferable to two. The best practice in each case, is determining by conditions. Trolley guards should be used at all crossings used by one-man cars.

Thirty-three companies report that transfers are issued when passengers leave cars, while nine companies issue transfers to passengers boarding cars. The former method is much preferred by the writer.

The best size of car can be decided only with the reference to the conditions under which it is to be used. The average length of car reported by sixteen companies is 30 ft., the maximum being 40 ft., and the minimum 21 ft. The average weight is reported as 22,300 lb., the maximum 30,000 lb., and the minimum 11,000 lb., with average seating capacity of thirty-five, maximum fifty-two, and minimum twenty-four.

The writer's experience has been with rebuilt single truck cars, and all steel one-man cars of the latest type, the latter cars weighing about 12,000 lb., 24 ft. overall, and seating twenty-six people. These cars were equipped with hand brakes and with 24-in. wheels, and their operation has been entirely satisfactory.

One-man operation in Jackson, Miss., was started shortly after the beginning of jitney competition, although this mode of operation would have been adopted even though there had been no such competition. The attitude of the public was favorable from the start, as the new cars were a credit to the company and to the community. The saving to the company in this case was marked and the cars did much toward the elimination of the jitney competition, which is now a thing of the past in that city. The writer is very partial to small car wheels. Cars so equipped are better liked by the public, as traveling close to the ground at a fair rate of speed is the nearest approach to an automobile ride obtainable.

From all data obtainable there can be no doubt but that one-man cars are a success when intelligently applied to a situation favorable to operation of this kind. Obviously there are cases where they would be a complete failure. To attempt their operation in the busy streets of Chicago would be as ridiculous as the operation of the heavy Chicago cars in the streets of a small city. Clearly there must be a line of demarcation between these two extremes.

The publicity attendant upon the elimination of one man from the operation of a street car is so great, and two-man operation is of such long standing, that the first impression of the public is that the company is requiring one man to undertake the work of two busy men, whereas, as a matter of fact, it is merely requiring one man to work to his reasonable capacity. This first impression is made more lasting by the constant designation of this type of car as a "one-man car." The sooner this designation is eliminated the better. As to safety of operation, the writer has heard of no instance where the use of but one man has resulted in an accident.

While in general, the one-man car should be of light construction, capable of quick acceleration, and easily controlled, there is much danger of going too far in the desire to secure light equipment. All equipment should be purchased with due regard to the kind of track over which it will be operated. A feather-weight car which would operate without damage to itself for a number of years over first-class track, will naturally go to pieces in a short time on a track with poor joint conditions. To permit the greatest flexibility of operation the car should be built for either one- or two-man operation. In most cases where it is necessary to put a second man on a car during rush hours, the conductor is stationed on the front platform and there is no change in the method of entrance or exit, this avoiding confusion to passengers.

In general, the one-man car must be made to look to the public like a development, an advanced idea, and something to be admired. Many an operator has made the mistake of beginning one-man operation with improper equipment, and as the first impression is always the most lasting, a mistake of this kind is unfortunate.

The writer does not believe that the popularity of one-man operation will wane with the disappearance of the jitney. However, street railways have not seen the last of the jitney, or at least of organized automobile competition. This competition may not take the form of the recent craze but may appear in the form of 10-cent fare conveyances which will cater to that portion of the street railway company's patrons who are willing to pay a bonus for rapid transit. The reappearance of the jitney will depend largely upon the service rendered by the railways and upon the exigencies of the labor situation.

While street railway earnings have generally improved in the last two years, the continued and further use of the automobile will place the street railways, especially in the smaller cities, in a position where every economy must be exercised, and where the advantages of one-man operation will have a strong appeal. The extended use of private automobiles has thrown upon the street railways a new burden, that of very light traffic on fair days and of heavy traffic in bad weather. It is safe to assume that the party who uses his own machine in fair weather and complains of the crowded condition of cars in stormy weather does not realize that he himself has contributed to this condition, and that it is unfair to expect that the street railway can satisfactorily take care of the army of automobile riders who use the street car service only during this period of natural congestion. This brings up the thought that in the street railway business, as well as in the electric business, there is such a thing as a load factor. The writer believes that many of the elements which now enter into electric rate making, must ultimately find a place in the establishment of railway rates.

Economic Aspects of Franchises*

Franchise Providing Maximum of Service for Rate Paid Is Based on Sound Economics—Franchises Have Evolved Through Periods of Misunderstanding Into One of Recognition of Mutual Interests of City and Utility—Salient Points of Typical Co-operative Franchises

By F. W. DOOLITTLE
Consulting Engineer, New York, N. Y.

THE use of the term "economic" in discussing franchises is perhaps not entirely justified by the nature of the following remarks. The writer is not a technical economist and has therefore refrained from the use of terms which have a significance peculiar to that science. No theory is proposed except that the franchise that provides in the long run the maximum of service per dollar paid therefor is sound public policy and sound economics or, quite as aptly, good engineering.

In the development of public utility franchises there appear to be four fairly well defined periods which may be characterized as follows: (1) a period of general misunderstanding as to facts; (2) a period of general misunderstanding as to motives; (3) a period of attempted arbitration by governmental agencies, and (4) a period of understanding of mutual interests involved and of the economic status of public utilities. Naturally no precise limits to these periods can be pointed out, as they overlap.

General Misunderstanding of Facts

In the early days it was customary for cities to vie with one another in the number of franchises which they should grant to public utilities. For example, it appears that in St. Louis street railway operation was authorized by forty-eight franchises, the earliest in 1867 and the latest in 1899. Forty-one of these franchises expire during nineteen different years from 1904 to 1948, and in seven cases the franchise does not fix the date of expiration. Franchises granted during this period were carelessly drawn, and many attempts were made by cities to induce the investment of capital in public utility enterprises and to hasten the date at which these utilities should be in operation.

Much of the difficulty experienced in later days may be traced directly to two errors, which appear now to have come from undue optimism on the part of those seeking franchises and from short-sightedness on the part of those granting franchises. The future appeared full of promise to the early investor, and the present worth of future business entered too largely into his calculations. The cities doubted the wisdom of monopoly and did not trust to the expansion of small beginnings to meet later needs when the service desired could be self-supporting. The first period, therefore, appears to have been one in which neither the municipality nor the corporation understood what could or should be done in the matter of rendering service, and there was no proper understanding of the economic fallacy of competition.

General Misunderstanding of Motives

The second period may be described as one of failure to understand the reasons for the unsatisfactory conditions which rapidly developed. In this period, as in the first, ignorance of the economic factors at work was evident in the things done both by municipalities and by owners of public utilities. This ignorance gave rise to the most serious and regrettable phase of the whole situation, mutual distrust and suspicion. The bitterness of that period has not yet entirely passed, but happily a new generation is now thinking more calmly and seeing more clearly, and though the years of loss and waste cannot be recovered, there is hope of better things for the future.

This period of misunderstanding and distrust can best be examined in the light of the following facts: The municipalities had encouraged competition. The utilities had invested beyond the needs of the times. Some utilities had contracted to render certain contributions to public funds, either in cash or in non-utility services such as paving streets, beyond their power of performance. Other utilities had made no such contracts originally but were later subjected to such requirements through ordinances passed by cities in retaliation for real or fancied dereliction. Certain hard-pressed utilities had sought to better their condition by consolidation but had found that the burden of unproductive investment could not be avoided in this way.

In the last connection it may be of interest to cite the case of the United Railways of St. Louis. This company consists of about thirty-three lines, a number of which were originally competitors. When these lines were consolidated, a good deal of duplication was found to exist and elements of value in the original lines disappeared. At the present time an appraiser would doubtless fail to find property to account for the present capital. The published reports of the company show that it is earning a return on only a part of the capital. Last year about 140,000,000 transfer passengers were carried. Suppose that half of these rides on transfers were rides which would have cost an additional fare if the consolidations had not taken place. These 70,000,000 rides represent $3,500,000 in fares—and $3,500,000 would pay 7 per cent. on $50,000,000, surely an amount greatly in excess of the difference to-day between the capital of the company and the value of its property.

In this second period, therefore, with the service in many cases not what it might be and with the utilities not prospering as their promoters had anticipated, there came about more or less serious antagonism between the communities and the utilities. Frequently this was artificially maintained for political purposes, but in many cases it was equally true that the city was rightfully dissatisfied with the service received and the utility was dissatisfied with the burdens imposed upon it.

Development of State Regulation

The third general period was marked by the development of state regulation by commissions operating under powers reserved by the state to itself. These commissions have as their function the arbitration of disputes which have grown out of the misunderstandings previously pointed out. The work of state commissions has not been altogether satisfactory. They have, however, been more stable and in general have been more equitable courts of appeal than have local bodies. When cities have undertaken to arbitrate the disputes which they have had with public service corporations, they have been placed in the position of being judges as well as advocates and the results have not been entirely satisfactory. Without imputing to state bodies any greater intelligence or justice than in the case of municipal bodies, it has nevertheless come about in a number of jurisdictions that the state commissions have been able to see more clearly the economic status of public utilities and have been able to point out the principles that must govern the permanent settlement of the problems that have retarded alike the growth of cities and their utilities.

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*Abstract of paper presented before the Engineers' Club of St. Louis, Mo., on March 7, 1917.

GROWING UNDERSTANDING OF MUTUAL INTERESTS

After the period of misunderstanding as to fact had been succeeded by the period of misunderstanding as to motive, and this in turn had been succeeded by an attempt to arbitrate difficulties, the recognition that the interests of the utilities and the communities are mutual has emerged as the principal present-day tendency in franchise matters. It has come to be seen that a utility cannot permanently give more service than its revenues will pay for, and it is also generally realized both that it ought not to give less, and that it cannot expect to preserve its rights if it continues to give less. Moreover, it is generally recognized that the city should prescribe the service it desires and then see to it that the revenues of the utility are sufficient to render this service. It is the function of the community to say when and where service shall be extended, and because it cannot thrive when its utilities are moribund, it must in its own interest, in view of economic laws not subject to repeal and automatic in their penalties, so adjust the relations between itself and the utilities that the latter may be vigorous agencies for public service. Some of the provisions recently developed to accomplish this purpose will now be examined.

It is apparent that in spite of a wide variation in detail the agreements more recently entered into have represented attempts to secure certain well-recognized advantages. These may be briefly stated as follows: (1) Service of such a nature as the city may decide upon; (2) extension of this service when needed, and (3) the minimum charge consistent with the service desired. The third of these presents unusual difficulties. It is not a simple matter to fix a rate of return just sufficient to provide that capital will flow freely into the business as desired, to determine a normal cost of operation that will be in keeping with the service desired, and to provide for these things in an agreement that must be automatic and as applicable to conditions twenty years hence as to those existing to-day.

STREET RAILWAY PROBLEM MOST DIFFICULT

By far the most difficult problem whose solution has yet been undertaken by utilities and municipalities is that which has to do with the rates of fare and standards of service of street railways. Next to water companies, it is probable that street railways are the most important factors in city development, and it is worthy of note that those city districts and people most greatly in need of street railway service are frequently those least able to pay the cost of rendering that service.

The street railway business is not one of decreasing costs, inasmuch as to a considerable extent each increment of traffic tends to increase the average length of ride and as a usual thing also tends to decrease the load factor. Riding during the rush hours is very largely habitual riding, that is, it represents movements of traffic which occur with great regularity from day to day. With the growth of cities and the development of outlying residential districts, it is found that the riding during the rush hour is increased by a greater percentage than is the riding during the rest of the day. For these reasons, street railway costs have increased in spite of certain factors which have tended to decrease them. This burden of increasing costs, together with the complexity of the operating problems involved, has made the work of devising a satisfactory agreement between street railways and the communities one of great difficulty.

A very interesting problem in connection with the operation of street railways is suggested by the increasing percentage of traffic moving during the rush hours. Electric companies have had a similar problem, but by adjusting rate schedules and by developing types of business which did not put any considerable demand upon the plant at the time of the maximum load, they have been able to overcome to some extent the extraordinary costs occasioned by a poor load factor. If some scheme could be devised whereby the riding on street railways could be more evenly distributed throughout the day, not only would the service be much improved, but the necessity for the very large investments occasioned by construction of rapid transit lines would be avoided and the urban transportation business would be placed on a much sounder financial basis than it is at present. Some years ago it was the custom and still is in a few smaller cities to give reduced fares during rush hours under the guise of workmen's tickets. The economic fallacy of this, however, has of later years been known, and certain operators are now seriously considering the advisability of charging lower fares during the middle of the day for the purpose of diverting as far as possible rush-hour traffic to a period when there is a less heavy burden placed on the transportation system. Serious efforts have been made to have large industrial and commercial establishments begin and close their day at varying hours so that the traffic would be more uniformly distributed. Very little progress, however, has been made. It is doubtful that under modern competitive conditions the larger stores can be persuaded to open and close at different hours, but there is no reason why factories and many offices should not assist in the solution of this problem.

Some figures recently made indicate very plainly the extent of the advantage which might be realized by such a plan. The operating records of a typical road were analyzed, and the costs of operation at different periods of the day were determined. The company operates normally about 50,000 car-miles or 6000 car-hours per day. The maximum number of cars in service, 640, is between 5 p. m. and 6 p. m., and between 6 a. m. and 8 a. m. there are 480 cars in service. On the basis of cost to the company 190 of the car-hours operated between 5 p. m. and 7 p. m. and 160 of the car-hours operated between 6 a. m. and 8 a. m., or 350 car-hours in all, could be replaced by 890 car-hours between 8 a. m. and 4 p. m., a net gain to the riding public of 540 car-hours per day or 9 per cent of the total. On the basis of uniform operation throughout the twenty-four hours the present number of car-hours, 6000, could be increased to more than 8000. It is a matter of indifference to the company, as the cost is the same in either case. The problem is purely one of community advantage. The patron is entitled to a dollar's worth of service for each dollar paid to the utility, and the big problem involved is how to give that dollar the greatest purchasing power.

The three principal examples of street railway franchises drawn with a view to realizing the benefit to be secured from co-operation between the utility and the municipality are the franchises now in effect in Cleveland, Chicago and Kansas City.

The franchise provisions which have usually been considered essential in the past may be classified generally under four heads. The first of these serves as an identification of the parties involved. The second division serves to define the rights granted. The third prescribes the duties of the organization, and the fourth general division of the usual franchise contains provisions defining the supervisory or regulatory relation of the community to the utility. In the past efforts have occasionally been made to incorporate in franchises provisions which would alter the regulations between the utility, its patrons and the municipality as the utility developed. Such provisions have usually been unsuccessful in practice although sound in economic theory, owing to the fact that marked changes in the art of rendering utility service have come about rapidly and in a way entirely unforeseen by those granting the original franchise. One of the most difficult matters that any body of men charged with the granting of franchises has to face is the estimating of what the future may bring forth, and it is along this line that both utility operators and communities have frequently been seriously in error in the past.

THE LIFE OF THE FRANCHISE

One of the principal contentions of authorities on franchise matters has been that no franchise should have a life covering a period longer than that within which the future could be readily estimated. This point of view is obviously correct if a franchise is so drawn as to define completely the conditions under which the utility shall operate and the price to be charged for its service. On the other hand, since the cost of capital is a large factor in the price which must ultimately be paid for service, and since long-term financing can be accomplished at a lower cost than short-term financing, it is not wise to attempt to make the life of the franchise unduly short. The dilemma here is that of increased costs of short-term security issues, and unknown conditions likely to be encountered before the expiration of long-term franchises. The solution of this appears to be in making the terms of the franchise sufficiently flexible to preserve the balance of rights and duties through periodic revision of the conditions imposed. The Chicago 1907 franchises have a life of twenty years. The 1909 Cleveland franchise has a life of twenty-five years, and the 1914 Kansas City franchise has a life of thirty years. Each of these franchises provides for termination at an earlier date upon certain conditions and also for extension on a prescribed basis. Obviously the length of life of these three franchises, varying from twenty to thirty years, is sufficient to place the conditions of operation beyond the knowledge of those who granted and accepted the franchise, and in view of this the franchises were made rather flexible in their operation. It is not clear but that additional economies might have been effected by naming a longer life, although had this been done it might have been necessary to make more elaborate provision for maintaining the original balance between the equities of the community and the corporation. Since long-term obligations in general command lower interest, however, it is evident that the advantage of the patrons will be served, other things being equal, by franchises of relatively long life.

RECONSTRUCTION AND EXTENSIONS

In each of the franchises referred to a program of reconstruction and remodeling of existing facilities is specified. In Kansas City this was carried into greater detail than in the other cities, although the provision of a Board of Supervising Engineers made it unnecessary in the case of the Chicago franchise to set forth all details as in the case of the other franchises.

One of the most important things to be considered from the standpoint of the community is the matter of extensions to meet growing needs. This is a particularly difficult problem to solve when the demand for service is not sufficient to make extensions pay for themselves. The Chicago franchise provides that the city has the right to require the company to make extensions totaling not more than 4 miles of double track or 8 miles of single track in any one calendar year. In the case of Cleveland, no special provision as to extensions was made in the franchise, but the officer of the city who represents the Council in its dealings with the Cleveland Railway confers from time to time with the officers of the company on this particular matter. Between them a program is made out and the company thereupon petitions the Council for authority to make these extensions. The Kansas City franchise gives the city the right to require the company to construct in any one year, on the average, 4 miles of single or 2 miles of double track, and any additional extensions which the Board of Control shall determine to produce an income on the investment of not less than 6 per cent per annum over the expense of operation.

During the last few years, owing in part to the developments undertaken in New York City, there has been a growing tendency for municipalities to finance expenditures for rapid transit facilities and certain types of extensions. Under the Chicago franchise, the city reserves the power to require the company to join with other street railways to defray the cost of subways as a downtown terminal, participation of all being limited to $5,000,000. There is no provision in the Cleveland franchise for city aid in financing rapid transit expenditures of this sort, but on Jan. 25, 1917, the street railroad commissioner addressed a communication to the City Council, proposing certain remedies for congestion in the Public Square—(1) the removal of all vehicular traffic, and (2) the removal of the street cars. The provisions in the Kansas City franchise allow the city, under the supervision of the city engineer, to construct additions to the company's lines, to be operated as a part of the company's system—when so certified by the Board of Control, these to be owned by the city.

SUPERVISION OF ADMINISTRATION

It is obvious that the more flexible the provisions of the franchise, the more necessary it is to have their administration supervised by far-seeing and capable men. It is in work of this sort that engineers in the past have been of most conspicuous service to their communities. Necessarily a technical problem, the administration of the relations between the city and its public utilities falls in the province of engineering practice, and it is to be hoped that the future will see an increased recognition of the necessity of employing engineers in such supervisory capacities.

The administration of the franchise provisions in Chicago is in the hands of the Board of Supervising Engineers, which has comprehensive power. In Cleveland the administration is by the street railroad commissioner, who maintains a technical staff. The Kansas City franchise provides that the company is to be organized with eleven directors, five of whom are to be designated by the city. A Board of Control of three arbitrators is also provided, one to be selected by the city, one by the company, and the third by the two so chosen or by a majority of the Kansas City Court of Appeals.

In addition to general supervision, there is provision in the Chicago ordinance covering the supervision of construction and the certification of capital additions.

The Cleveland franchise provides that additional extensions or permanent improvements proposed by the company must be approved by the Council. The Kansas City franchise provides that all extensions and additions shall be made under the supervision of the Board of Control. It is naturally highly important to fix the capital account as of the date of the beginning of the ordinance period. In each of the three cities this was done by engineers who considered both tangible and intangible elements of value, together with certain adjustments which were necessary, due to the fact that the franchise became operative at some little time after the date as of which the value had been determined.

SERVICE AND FARES

Each of the three franchises contains a certain provision concerning the service to be rendered. The details under the Chicago ordinance are left to the Board of Supervising Engineers, and it is interesting to note that the State of Illinois recently handed down a decision which was in conflict with certain rulings previously made by the board. This is but another example of the difficulty of foreseeing the future. One provision in particular in the Chicago ordinance is worthy of comment, *i.e.,* "Every electric car must be under the control of two competent men, motorman and conductor, and must be operated singly." This provision restricts the service to an extent which the city did not originally contemplate. There are a number of places on outlying lines where it is entirely feasible to operate cars under the control of one man, and it has recently been recommended that trailer operation would considerably increase the capacity of tracks in the downtown districts during rush hours. The Cleveland franchise reserves to the city the entire control of the service, including the right to prescribe schedules and routes. The Kansas City franchise specifies the use of two-man cars, except when otherwise ordered by the Board of Control, this provision having been based upon the experience of larger cities in effecting desirable economies in the cost of service.

The three franchises prescribe rates of fare, and with the exception of the Cleveland franchise no variation in the rate is contemplated. While the provisions of the franchises which define the obligations of the utilities contemplate changing economic conditions, there has been relatively little thought given to the adjustment of fares to meet these changed conditions. In the case of Cleveland the automatic regulation of fares has not been satisfactory, owing to the reluctance of the city to permit the company to take care of operating deficits, now accumulated to more than $1,000,000.

The provisions for upkeep of capital investment are also important. In Chicago the allowance for maintenance and repairs is at least 6 per cent of the gross receipts, and for renewals and depreciation 8 per cent of the gross receipts. In Cleveland a specific allowance expressed in cents per car-mile has been provided. In Kansas City the cost of maintenance, repairs, renewals and depreciation is required to be paid out of earnings and to be charged to a maintenance and renewal reserve, this is to be not less than 16 per cent of the gross earnings for the preceding year. The unusual provision in this franchise is to the effect that the accumulated amount representing the unexpended portion of the depreciation reserve shall be held in trust for the city in case of purchase of the property. The marked increase in the cost of materials and labor during the last ten years have made entirely inadequate in many cases provisions for depreciation based on revenue and estimated to be sufficient on the basis of prices prevailing in the past.

One of the most important and necessary provisions is the basis of purchase of utility property by the city or its licensee. Each of the three franchises provides in detail how this shall be brought about. Each of the three franchises also provides definitely for the disposition of any surplus which may exist from the operation of the utility. In Chicago there is deducted from the gross revenue all operating expenses together with the amounts accrued with the approval of the Board of Supervising Engineers to cover depreciation and renewals. From the balance thus obtained there is then deducted 5 per cent of the capital value, and the remainder is divided on the basis of 45 per cent to the company and 55 per cent to the city. The Cleveland franchise provides that there shall be set up an interest fund fixed initially at $500,000. To this fund there is credited monthly gross receipts after deducting allowances for operating expenses, maintenance, renewals, depreciation, taxes and bond interest. Out of this fund there is to be paid to stockholders an amount not to exceed 6 per cent on the balance of the capital value. In Kansas City it is provided that there shall be deducted from gross earnings all expenses of management and operation, all taxes and public charges, and an amount equal to 6 per cent cumulative upon the capital value. The city shall be owner of an equity interest in the property to an extent of the surplus which shall be used to pay for extensions and additions up to $6,300,000. Beyond this figure two-thirds of the surplus income goes to the city and one-third to the company.

CONCLUSION

Without further analysis of these and similar franchises, it is apparent that for the most part they have been drawn with the idea of providing a continuing adjustment to changing economic conditions. It is not so evident that the provisions have always been subjected to proper engineering scrutiny as to their effects on cost. Franchise writing is not greatly different from the drawing of specifications and should therefore have devoted to it the best engineering skill. In fact, many of the past difficulties have arisen from the fact that franchises have displayed more the handiwork of politicians and lawyers.

The problem seems to be one in applied economics and one in which the engineering profession is capable of rendering real service to the community. There must be determined a proper and just balance between costs, service and obligation of the utility and its patrons with respect to community funds. Future costs must be so estimated as to give due consideration to changing markets, changing standards of service, changing volume of business, and the credit of the company as determined by the length of its franchises and the conditions under which it will find itself at their expiration. Where changing conditions are likely to make this too difficult a matter, to take care of indefinite franchise provisions some method of adjustment at the hands of able and far-sighted men must be provided.

The industrial world has found that large advantages are to be obtained by the adoption of general profit-sharing plans, and it is suggested that whatever form franchises take, some provisions should be made so that able management and conscientious service may be rewarded. The proportionment in which the various parties should participate in the savings resulting from efficient management it is not easy to determine, but it has been suggested, and with apparent propriety, that the savings may be divided, say, 20 per cent to the employees of the utility, and the balance equally between the municipality and the stockholders of the public service corporation.

How the Pacific Electric Solves Surface Drainage Problems

Standard Redwood Culverts Used Under Interurban Track—Culverts of Concrete, Reinforced with Old 20-lb. Rail, for Paved Streets

By CLIFFORD A. ELLIOTT

Cost Engineer, Maintenance of Way Department, Pacific Electric Railway, Los Angeles, Cal.

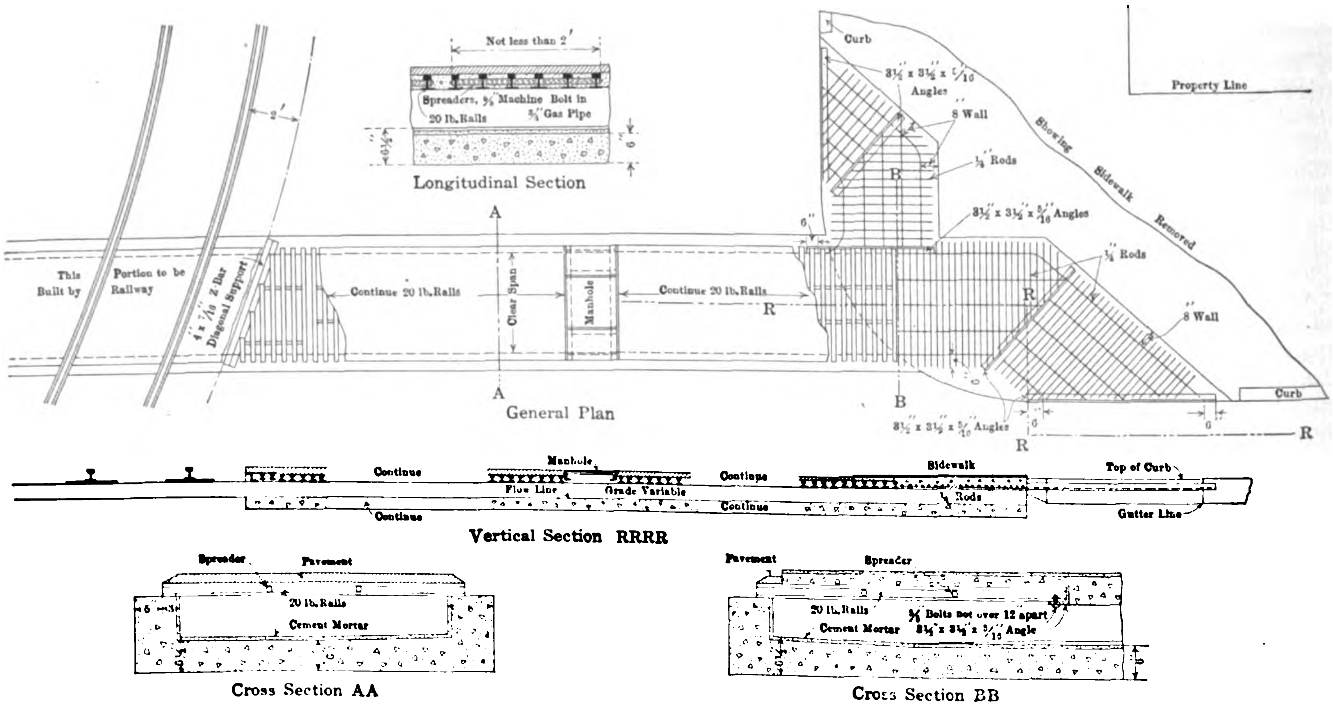
THE average rainfall during the rainy season in southern California from November to March is about 15 in. Rainstorms of two or three days' duration are not uncommon, and result in a total rainfall of from 2 in. to 5 in. This creates a serious problem for the railways in protecting interurban lines from damage, especially where large quantities of water are directed toward the right-of-way and roadbed by drainage systems of adjoining ranches, public highways and the real estate subdivisions which are constantly being developed throughout this territory. The peculiar topography of the country makes it particularly difficult to cope with the situation.

The lines of the Pacific Electric Railway radiate from Los Angeles to the mountains on the north and east, and to the ocean on the south and west. The land gradually slopes from the mountains to the sea. The lines traversing the mountain district, foothills and adjoining valleys have a firm soil favorable for their construction and maintenance, as it offers more resistance to storm waters than the sandy roadbeds and soft, yielding, sandy subsoil characteristic of the territory near the ocean. However, farther inland the slope of the land is greater, and in consequence of its greater velocity the water damages the tracks and roadbed more there than near the sea. Although the most severe and immediate damage is done in the foothill and valley district, the water ultimately reaches the track on sandy roadbed near the ocean. This, especially the unballasted track, is endangered and requires protection. These lines run through country with a low elevation, and the water, coming from both sides, collects on the sandy roadbed and forms water pockets as it moves slowly down the tracks endeavoring to find an outlet.

During the summer months before the period of heavy rainfall, numerous studies of drainage conditions are made by the railway engineers in conjunction with municipal and county officials, various civic bodies and storm drainage committees usually consisting of ranchers. When improvements are made by installing culverts, constructing draining ditches, etc., with a view to proper handling of the water during the stormy season, each party interested assumes its proportion of the expense according to the amount its property is benefited. At public highway crossings grade changes are often occasioned by paving improvements on the highway which usually gives rise to new drainage problems. In this event the company co-operates by providing adequate culverts under its right-of-way, or track, of sufficient capacity to join those placed by other interests. Frequently the need for such improvements is observed by the railway, and it proceeds in the same spirit of co-operation seeking concessions from the other party for improvements beyond the company's property.

SMALL WOOD CULVERTS FOUND EFFICIENT

In order to meet some of these difficulties, standard types of wood surface culverts have been adopted.


Not less than 2'
Spreaders, 5/8" Machine Bolt in 3/4" Gas Pipe
20 lb. Rails
6 1/2"
6"
Longitudinal Section
2'
This Built by
Portion to be Railway
4" x 7/16" Z-Bar Diagonal Support
Continue 20 lb. Rails
A
Clear Span
Manhole
Continue 20 lb. Rails
R
A
General Plan
Curb
3 1/2" x 3 1/2" x 5/16" Angles
8" Wall
1/4" Rods
B
Showing Sidewalk Removed
Property Line
6"
3 1/2" x 3 1/2" x 5/16" Angles
1/4" Rods
R
8" Wall
Curb
B
3 1/2" x 3 1/2" x 5/16" Angles
6"
6"
R
R
Continue
Manhole
Flow Line
Grade Variable
Continue
Continue
Continue
Sidewalk
1/4 Rods
Top of Curb
Gutter Line
Vertical Section RRRR
Spreader
Pavement
20 lb. Rails
Cement Mortar
Cross Section AA
Pavement
Spreader
20 lb. Rails
5/8 Bolts not over 12 apart
Cement Mortar
3 1/2" x 3 1/2" x 5/16" Angle
6"
Cross Section BB

STANDARD CONCRETE CULVERT REINFORCED WITH OLD RAIL FOR PAVED STREET INTERSECTIONS IN LOS ANGELES

These are constructed of redwood from 1 in. to 3 in. thick, are made 12 in. deep, and from 4 ft. to 16 in. wide, to suit various conditions. Twelve-inch planks are placed across the top and bottom, the bottom planks being spaced 3 ft. apart. In some instances, depending upon the amount of water it is necessary to handle, and where the damage is likely to be great, Armco iron culverts of suitable dimensions are installed, with concrete end walls. The gage of a culvert of this class is determined by the depth of its location below the surface of the ground and the probable weight it will be required to carry. However, in most cases, the more economical redwood box culverts are suitable for solving the surface drainage problems. Often during a storm period the division roadmaster finds that a new water course has been established, and, from his observations of the drainage area involved, he can readily determine with the standard drawing in his possession the size of culvert required to remedy the situation. No time is lost in making expensive field engineering studies necessary to calculate the drainage area involved, and immediate action can be taken by an order on the bridge and building supervisor who perhaps has on hand at the shops the particular type of culvert requisitioned, or it can be made within a day or so for shipment to the roadmaster for immediate installation. Such prompt action prevents heavy damage to the track, affords proper protection, and minimizes maintenance expense for excessive surfacing and aligning after the storm.

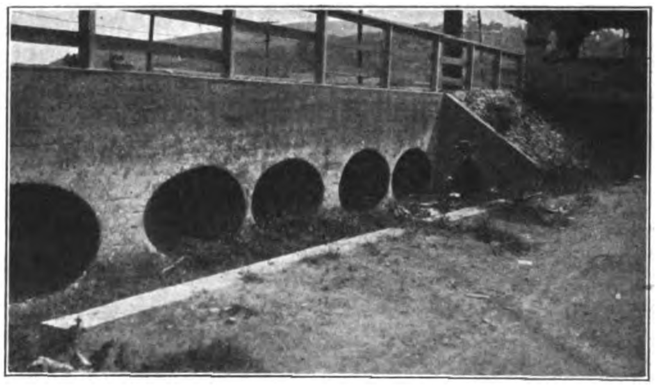
At the close of each rainy season the engineers and roadmasters make a general inspection of the damage done during the past season in order that recommendations may be made for the program of culvert improvements during the summer. Of course, each rainy season works different hardships. In one season the installation of numerous culverts may be necessary at points which were not affected during the previous season, and others already installed may require enlargement to provide additional drainage.

Culverts of the surface type are very economical to provide and maintain. They prevent damage to the roadbed at the time of the storm as well as largely eliminate repairs to the roadbed by providing adequate drainage. However, it must be borne in mind that in creating an opening under the tracks for properly draining the roadbed, precaution must be exercised in order not to turn storm waters onto adjacent property and thus invite possible damage claims from land owners. The lines are, therefore, provided and maintained with suitable side drainage ditches which carry the additional water along the right-of-way to the streams or to outlets at public highways.

On the lines near the ocean where the land is extremely flat, the water collecting on the roadbed, as mentioned above, softens the unballasted track, which accelerates general deterioration and necessitates considerable surfacing and aligning after the rain. This is especially true in cases where the water approaches the roadbed from one side, follows the tracks, crosses over, and then returns from the other side. This situation is very troublesome, and has been met by the extensive use of a small wood culvert made of three 2-in. redwood planks 16 ft. long. They are constructed either with top or without, as conditions warrant, are easily cleaned and handled, and are more economical than tile drains. When made of redwood lumber they last from seven to eight years, and are not subject to breakage, as in the case of tile pipe, when removed for cleaning, readjustments and relocating, or from the use of track tools in making track repairs. Good results can be obtained on a bad section of double track by installing ten of these small drain boxes to the mile, staggering the installation, that is, putting them under tracks and between the two tracks to follow the course of the water. Of course, some sections of track are more troublesome than others, and the number of culverts necessary in those cases may exceed this estimate. Where the company operates four-track lines, the small culvert has given excellent results in handling the surface water, and the drainage of a four-track line in this flat country is a serious problem. The drain boxes are also invaluable in draining ballasted track, interlocking plants, special work layouts and switches. In either buried or unburied track with dirt roadbed, the installation of the culvert under the track is done simply by respacing the two ties displaced by the drain box. These small drain boxes have also proved very effective in adequately draining filled approaches to bridges, where the surface water collects, by carrying the water directly to the streams or side drainage ditches.

TABLE GIVING DATA ON CONCRETE CULVERT DESIGN BASED ON A STRESS OF 13,000 LB. PER SQ. IN.

District	Load per Wheel	Culvert Number	Clear Span	Spacing of Reinforcing Rails	Length of Reinforcing Rails	Weight of Metal in Lb. per Linear Ft. of Culvert, Lbs.
Wholesale or industrial........	12,000 lb.	1	2′	3″	2′6″	71.0
		2	2′6″	3″	3′	84.3
		3	Double 2′	3″	4′11″	139.7
Residence........	6,000 lb.	4	2′	6″	2′6″	37.6
		5	2′6″	5″	3′	52.3
		6	3′	4″	3′6″	74.3
		7	4′	3″	4′6″	124.3
Hilly............	4,000 lb.	8	2′	6″	2′6″	37.6
		9	2′6″	6″	3′	44.3
		10	3′	6″	3′6″	51.0
		11	4′	5″	4′6″	76.3



OBLIQUE BATTERY OF 42-IN. IRON CULVERTS UNDER TRACKS OF PACIFIC ELECTRIC RAILWAY

RAILWAY CO-OPERATES WITH CITIES

In the city of Los Angeles where the tracks are on streets undergoing improvements, when grade changes are required to meet the official established grade, and it is necessary to provide surface drainage after the street is paved, the company co-operates with the city according to its franchise obligations, and installs culverts of dimensions and type similar to those placed by the city in the portion of the street for which it may be obligated. A reinforced concrete culvert, as shown in the line drawing reproduced herewith, has been adopted as standard for paved street intersections. Culverts of this type, when installed under the track according to the company's plans, successfully hold up under the load and prove entirely satisfactory for the purpose intended. The company has an available stock of scrap 20-lb. rail released from abandoned lines or from tracks reconstructed with heavier rail to meet the exigencies of traffic. This old steel is utilized to good advantage in the construction of culverts of this class. In the plan adopted by the city, the company is permitted to deviate from the standard to meet its needs. To have the construction of sufficient strength to withstand the heavy loads of traffic, double culverts are used, with the compartments reinforced in both the top and bottom slabs, the middle section between the compartments being vertically reinforced, and vertical reinforcement being also put in each side wall. The result is that the reinforcement is complete in every unit of concrete involved in the culvert. This improvement in this particular standard has resulted in a first-class job and in no instance have the culverts failed when constructed according to this plan.

In some of the smaller cities the company has been instrumental in having the municipal authorities alter similar plans or standards, or accept this same standard. The city thus obtains better results for its own culvert improvements, and the railway also is able to adhere to its standard when considering permanent drainage systems for handling the surface storm waters that it is required to carry beneath its track.

Connecticut Company Awarded Brady Medal

Pacific Electric Railway and Interstate Public Service Company Also Come In for Honorable Mention

AT a meeting of the trustees of the American Museum of Safety held on March 13 the recommendations of the committee on award were unanimously approved. The medal was awarded to the Connecticut Company, New Haven, Conn., L. S. Storrs, president. The silver replica of the medal was awarded to S. W. Baldwin, assistant attorney in charge of the claims department of the Connecticut Company, and the bronze replica to W. J. Flickinger, assistant to President Storrs.

The recommendation of the committee that honorable mention be accorded to the Pacific Electric Railway, Los Angeles, Cal., Paul Shoup, president, and to the Interstate Public Service Company, Indianapolis, Ind., Chester P. Wilson, president, was also approved.

In making its recommendations the committee stated that the work of the Connecticut Company in the safety movement had impressed it not only for the excellent record made as far as statistics were concerned, but also on account of the efforts made to enlist the co-operation of the public. Of special interest was the successful effort to interest school children through essay contests, although other activities were of equal value. This company operates its lines in more than a dozen cities of moderate size. In some of these the operating difficulties are considerable on account of congestion of population and narrowness of streets. Operation has also been rendered more difficult due to the influx of population along the lines of the company, which has resulted from the expansion in manufacturing occasioned by the European war. The neighborhoods of Bridgeport, New Haven, Waterbury, Hartford and other sections are centers of activity in munitions and related industries.

The award of the silver replica was made to Mr. Baldwin in recognition of his campaign to impress upon the public the need for the more careful use of the highways and more caution in the use of street cars; as well as his success in obtaining co-operation among all departments of the company. It also recognizes his careful study of the causes of accidents and the outlining of plans for their prevention. The bronze replica is given to Mr. Flickinger because he successfully directed the campaign among employees to promote closer co-operation among individuals in departments, and studied the general subject of accidents, preparing data thereon and originating forms for collecting data.

The Museum of Safety committee on award of the Brady medal this year comprised the following: Bion J. Arnold, chairman, Halford Erickson, Frank R. Ford, Will S. French, A. Hertz and James H. McGraw.

Bringing the Man on the Inside and the Man on the Outside Together*

The Basis for Co-operation Must Be Recognition of the True Status of Private Property Devoted to the Public Use

BY FRANK H. SOMMER

Dean New York University School of Law

THE differences of opinion between the managers of public utilities and the public regarding the operation of public utilities are due to the differences in conception regarding the status of private property devoted to public use. On the one hand the public utility men are apt to consider their property as similar to other private property, while on the other hand, there is a tendency for the public to consider the utility property as public property. It is private property, but owing to the fact that it is devoted to the public use and that, therefore, the public has a peculiar interest in it, public utility property is essentially different from other private property.

Because public utility property is devoted to the public use, the public is concerned with its administration in two particulars; first as to the service which is to be furnished and, second, as to the charges which can be made for that service. In prescribing limitations in these matters, however, it is necessary for the public to realize that it is dealing with private property.

PUBLIC UTILITY PROPERTY IS ALWAYS PRIVATE

The investment of private capital in a quasi-public enterprise does not impair the right to protection as private property, but by reason of the connection between the use of the property and the public welfare it becomes peculiarly subject to regulation by the state. There are two fundamental constitutional provisions that act to safeguard this property; the one relating to the prohibition of the enactment of laws by the state impairing the contractual obligations between the state and the corporation and the other prohibiting the taking of private property for public use without just compensation.

"The man on the inside" must remember, however, that while he is handling private property this property is dedicated to the use of the public upon which he is dependent. On the other hand the "man on the outside" must be brought to realize that the owners of the property are entitled to a fair return upon their actual and reasonable investment. If we can find a common ground upon which both of these men, the one on the inside and the one on the outside, can meet, then many of the serious difficulties that now arise will disappear.

PRACTICAL CONSIDERATIONS AFFECTING THE RATE OF FARE

From the practical standpoint we must realize that the concept of the nickel as the proper rate of fare has become fixed in the public mind. Even if legislative enactment should permit the charging of a 6-cent fare or the abolishing of special fares lower than 5 cents, such an enactment could be carried into effect only with difficulty, with serious friction. This would be reflected in the action of municipal bodies which would refuse to grant the needed secondary franchises for the extension of existing facilities except upon contract terms which would restore the former conditions if legislation permitted.

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*Abstract of address delivered before Public Service Company Section, American Electric Railway Association, March 1, 1917.

But suppose that it is found, after careful investigation by an administrative tribunal, that the rate of fare is too low and may be raised, there is still the possibility of competition. If, say, the jitney bus can compete with the railway at a lower fare the authority to increase the rate might as well not be given. Nothing can be accomplished unless all of the enterprises affected with the public interest are equally regulated.

There is another side to the matter. If on a certain railway line the flow of travel increases so as to demand increased service the state has a right to require this service. But if unregulated competition is allowed to bring down the net return on the investment in the railway then the state is not in a position justly to demand the added service. The fact that the man on the inside has not only to operate his property to provide a reasonable return but also so that fresh capital can be obtained for needed extensions and improvements indicates that the man on the outside, for whose benefit these improvements are to be made, has a vital interest in both aspects of the problem.

THE UTILITY MUST GO TO THE PUBLIC

I am glad that the public utilities have awakened to the necessity for going directly to the public. The use of the press and of representation in legislative halls is entirely commendable. But as a member of the legal profession I would call attention to the danger of legalism. It will not do for any of us to stand at all times upon our technical legal rights. The question ought to be as to what from the standpoint of sound business judgment is right, rather than what from the technically legal standpoint is right. If the law accords with sound business principles, the utilities should take their stand upon it. Every effort should be made to square the law with sound business principles. The lawyer, especially one with a narrow point of view, without business training, out of touch with the trend of public opinion, without a full realization of the reaction of public opinion, when settled, upon the development of the law, is an unsafe adviser of those who deal on behalf of public utility enterprises with the public.

The utility must use the utmost caution in making changes in operating conditions which will antagonize the public. Public opinion when it has time to gather itself together is generally fair but sometimes, when aroused to white heat by the demagog who seizes upon every pretext, fair and unfair alike, calculated to arouse unreasoning prejudice and passion, it is ruthless and unfair. If, however, duty to the investors requires that a change be brought about, a complete disclosure of the facts should be made to the public and a campaign of education, at once, entered upon.

SUMMARY AND CONCLUSIONS

In conclusion I wish to express appreciation of the part that transportation plays in our nation. Transportation in all of its phases has made us a nation in fact as well as in theory. It is, therefore, vital to the life of a community that sound fact and good common sense, with the sinking of legalism and mere technical rights, be made the basis for solving transportation problems, both on the part of the public and the part of the utilities. If we are to put off the day when the public will exercise its right to take over the properties affected with a public interest, this must be done. I trust that this day will not come until we have raised up, through the civil service, a body of public servants as capable of managing these properties as are those who have managed them in private interest.

If the views which I have outlined, which are by no means new, were entertained by our people generally, all of the unreasoning antagonism which crops out in connection with questions presented before municipal bodies, legislative commissions and legislatures would, I think, disappear. Then problems would be solved on a business basis in the joint interests of the people served and the investor.

COMMUNICATION

Uniform System of Truck Classification

TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY

INDIANAPOLIS, IND., March 14, 1917.

To the Editors:

I have read S. A. Bullock's article on a uniform system of truck classification published in the ELECTRIC RAILWAY JOURNAL for Feb. 3, 1917, and I believe that the suggested plan would be desirable both from the standpoint of the truck builder and the railway company. The system that Mr. Bullock has proposed appears to be a simple one and at the same time sufficiently comprehensive.

The next step is, obviously, to devise a means of securing the approval of those who are most interested to the end that they would adopt some uniform classification, but it appears problematical whether it would be better to take this question up direct with the truck manufacturers, or to depend upon some political railway representative to "start the ball rolling."

L. M. CLARK, Superintendent Equipment.

Westchester Has 99.3 Per Cent of Trains on Time

During the period from May, 1916, to October, 1916, inclusive, the New York, Westchester & Boston Railway operated 38,790 passenger trains. Of this number, 284 were late into terminals. Of the 284 late into terminals, 242 were delayed either by congestion of traffic on the Harlem River branch of the New Haven Railroad, or by the drawbridge over the Bronx River, principally the latter. The other forty-two delays were from causes directly traceable to failures of the equipment of the New York, Westchester & Boston Railway, such as the breaking down of motors, etc.

Reduced to percentages, of the 38,790 trains run during the above mentioned six months' period, 99.3 per cent were on time, including the 242 trains delayed by causes beyond the control of the Westchester. If the trains delayed are considered only by causes within the control of the Westchester, the total number of which delays was forty-two, it is only one-tenth of 1 per cent of the total. In other words, over a six months' period, of every 1000 trains operated, 999 came through to terminals without being marked up late due to any failures of operation or equipment on the part of the Westchester, and 993 trains out of every 1000 were on time, regardless of all delays.

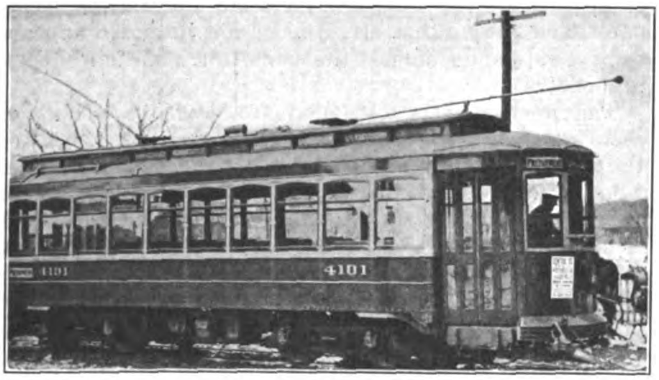
Practical and Economical Solutions of Problems in
EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Bay State Car Remodeling

Inclosed Vestibules and Pneumatically Operated Doors and Steps Added to 200 Cars in City and Suburban Service

Two hundred semi-convertible cars of the Bay State Street Railway are now being reconstructed into the completely vestibuled type with the installation of fare boxes, pneumatically operated doors and steps, and a buzzer signal system. In the main these cars have 28-ft. and 30-ft. bodies, four-motor equipments, and cross seats, with longitudinal seats at the ends. The completion of the reconstruction job, by adding these cars to the 200 new rolling stock units which were lately purchased, will virtually give the company a total of 400 up-to-date car units to meet the traffic demands with which it has to contend.



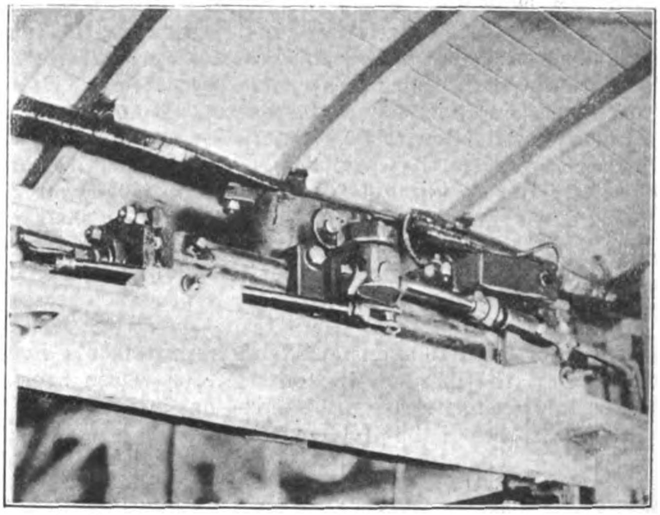
VIEW OF BAY STATE REMODELED CAR WITH INCLOSED VESTIBULES AND PNEUMATICALLY OPERATED DOORS AND STEPS

The work includes the removal of the bulkheads inside each car, with consequent increase in the passageway width. The reconstruction also covers the complete overhauling of each car, including repairs to trucks, bodies and motors where necessary, and repainting. Improvements in the insulation of the motor contactor boxes are also features of interest.

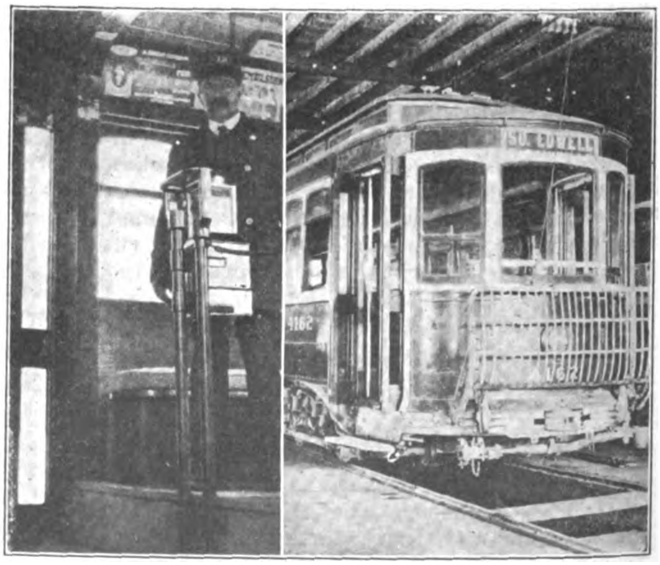
The cars being remodeled are of five classes, having been manufactured in the St. Louis and Cleveland shops of the J. G. Brill Company and in the shops of the Laconia Car Company in New Hampshire. Work was begun in the fall of 1916, and it is expected that all the cars will be remodeled in time for participation in the summer traffic of the present year.

Johnson fare boxes and National Pneumatic door and step control are being installed in the cars. The widths of the outer vestibule doors are being kept virtually unchanged. The inside width at the bulkhead arch, however, in a representative completed car, is now 5 ft. 10¾ in., and the corners of the longitudinal seats have been rounded. This affords more clearance between the central fare box standard and the end posts, and adds much to the passengers' convenience in entering and leaving the car.

At the conductor's station beside the fare box are two valves with wooden handles. These valves control the door and step operation for the rear doors on both sides of the car. At the front of the car on each side of the motorman's air brake valve are two similar valves for the operation of the front doors and steps. The door panels are supplied by the Laconia company, and have rubber anti-moisture diaphragms interlocking at the vertical center line. There are two upper sashes of clear glass and two wire-glass lower sashes in each door.



DOOR ENGINE MOUNTED IN RECESS ABOVE DOOR

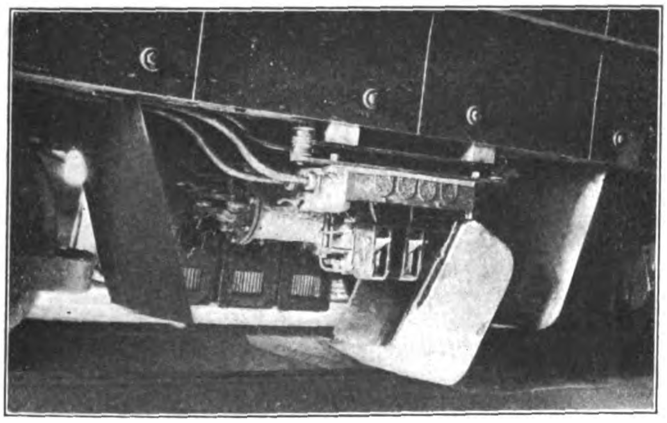


INTERIOR VIEW OF REAR END SHOWING CONDUCTOR'S CONTROL STATION; NEAR VIEW OF FOLDING DOORS AND STEP

An electric switch is connected mechanically with the pistons of the door engines in such a way that the closing of the door closes the switch which interlocks with the control circuit. This makes it impossible to start the car until all the doors and steps are closed. Furthermore, through this interlock, the opening of a door while the car is in motion will automatically cut off the propulsion current.

Each pneumatic door engine is mounted in the recess above the door header which it controls. Owing to its compactness the recess is large enough to afford easy access to all parts of this equipment.

The new shelf headers and door jambs which were required because of the change to folding doors were naturally adapted to take care of the pneumatic equipment. The doors are operated on ball-bearing supports. Inside the vestibule, on each side, a pipe stanchion runs from the floor to the roof framing for grab-handle service. The door opening is 33 in. in most cases, the clearance between stanchions being 30 to 31 in., according to the car class. New thresholds are being installed between the car body interior and the vestibule, the old thresholds being designed to accommodate sliding doors. With the rounding of the seat corners at the ends, the company is also placing a dasher-iron bulkhead below the seat projection to protect the seat support from abrasion. The rounding of the seats means practically the reconstruction of the seat top, and this is being handled at the shops of the Heywood Brothers & Wakefield Company.



MOTOR CONTROL CONTACTORS MOUNTED UNDER CAR AND PROTECTED BY MUD GUARDS

The 34¼-in. x 10-in. oak step is supported from the vestibule sill and operated by two-arm step devices, the height of the step above the rail being from 15 in. to 17 in. A rise of 13¼ in. occurs from the step to the vestibule, with a further rise of 11 in. from the vestibule floor to the car floor proper. Dasher iron toe guards are being installed behind the outer step.

All the remodeled cars are being equipped with the Consolidated Car Heating Company's buzzer signal system, eighteen push buttons being installed in each car. With each car four sets of mudguards are installed, as illustrated, to protect the contactor box, rheostats and air compressor. These are all mounted in a central location beneath the car floor and between the trucks, the guards each consisting of a steel plate, 30 in. x 28½ in. x 1/16 in., inclined at an angle of about 50 deg. from the vertical and clearing the rail by 8 in.

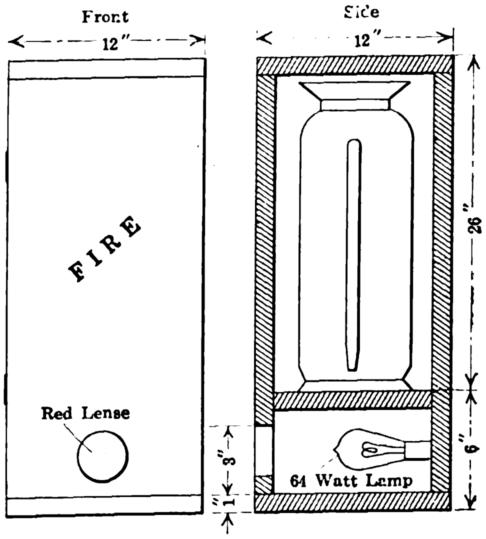
The control contacts which were already installed were adapted to work with the interlocking feature of the pneumatic door and step control, as already noted. The wiring is carried into the contactor box in conduit terminating in insulating bushings seated in the wall of the box. The box, as shown by one of the illustrations, is attached by bolts to two iron straps carried horizontally by General Electric insulating bolts from two similar iron straps attached by bolts to the cross sills. Inside the box and between the contactor arc chutes and the box frame a sheet of transite ¼ in. thick is placed to prevent any arc from a contactor communicating with the box proper. This arrangement insulates the entire contactor box from the car body and ground.

Inexpensive Improvements Will Reduce Insurance Rates

BY W. H. BOYCE

Superintendent Beaver Valley Traction Company, New Brighton, Pa.

No doubt there are many railways which are paying needlessly high fire insurance rates. Even though the shops are not new and of the most modern fireproof construction, the insurance rate can be considerably reduced by complying with certain of the recommendations of the Fire Underwriters' Electrical Bureau. This was done in our shops, with the result that the yearly saving in the cost of insurance is greater than the expense which was necessary to make the required improvements.



ANTI-FREEZE BOX FOR FIRE EXTINGUISHERS

The following table shows our insurance rates before and after the improvements were made:

	Rate	Amount
1907-1908	0.8391	$252,590
1908-1909	0.8391	261,475
1909-1910	0.8940	275.000
1910-1911	0.8940	275,000
1911-1912	0.68035	300,000
1912-1913	0.6761	300.000
1913-1914	0.59807	317,000
Total saving per year on $300,000 of insurance as below:		
1911—$300,000 at 0.8940		$2,682.00
1913—$300,000 at 0.59807		1,794.21
Total saving per year at new rate		$887.79

The yearly saving of $887.79 was the result of improvements which cost only $650, including the cost of one 40-lb. chemical extinguisher. The other improvements included placing the wiring in conduits and complying with the minor recommendations of the Fire Underwriters. None of these were expensive, and we followed them through and made sure that we got a reduction in rates for all improvements made. This is best done by securing from the bureau a schedule of the rating of the different items. This will show the basic rates and an itemized list of the extra charges which are made for deficiencies. Many of the deficiencies are easily remedied, and the extra charge thus eliminated.

To protect the fire extinguishers during cold weather, anti-freeze boxes such as shown in the accompanying illustration have been made. These are built of 1-in. wood lined with asbestos. A 64-watt lamp located under the extinguisher as shown furnishes heat enough to prevent freezing. The red lense in the front of the box is illuminated by this lamp. This calls attention to the location of the extinguisher and provides a means of readily seeing if the lamp is burning.

Sidestepping High Cost of Materials and Labor in Repair Shop

Economical Method of Repairing Plush Cushions—Use of Cast Iron in Place of Brass for Certain Car Fixtures—Details of Home-Made Resistance Box for Headlights

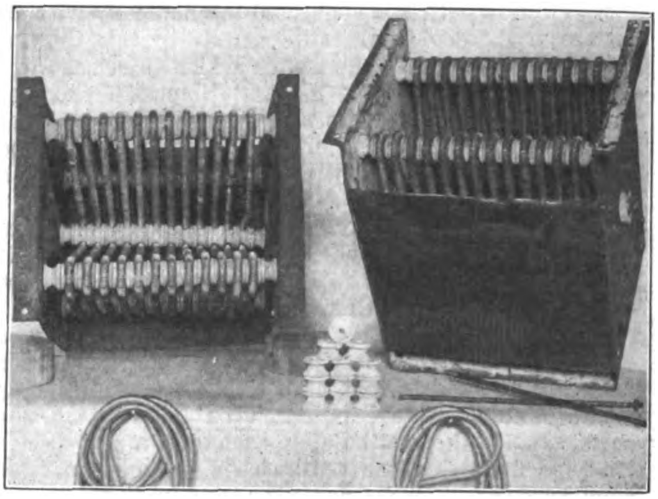
BY F. J. FOOTE

Master Mechanic Ohio Electric Railway, Columbus, Ohio.

In common with most electric railway companies we have been obliged to practice all kinds of economies. In a way this has been a good thing for us, as we have discovered several efficient ways of cutting down expenses without appreciably lowering the standards of quality. Having discovered and tried these out, we are likely to continue the use of them even in times of greater prosperity.

We have always been put to considerable expense in repairing arc headlight resistors. About a year ago we began experimenting with a home-made resistor. This has been developed, improved and finally standardized, and we find it is cutting down our expense for this item about 50 per cent. Details of this resistance box are given in the accompanying drawing and bill of material.

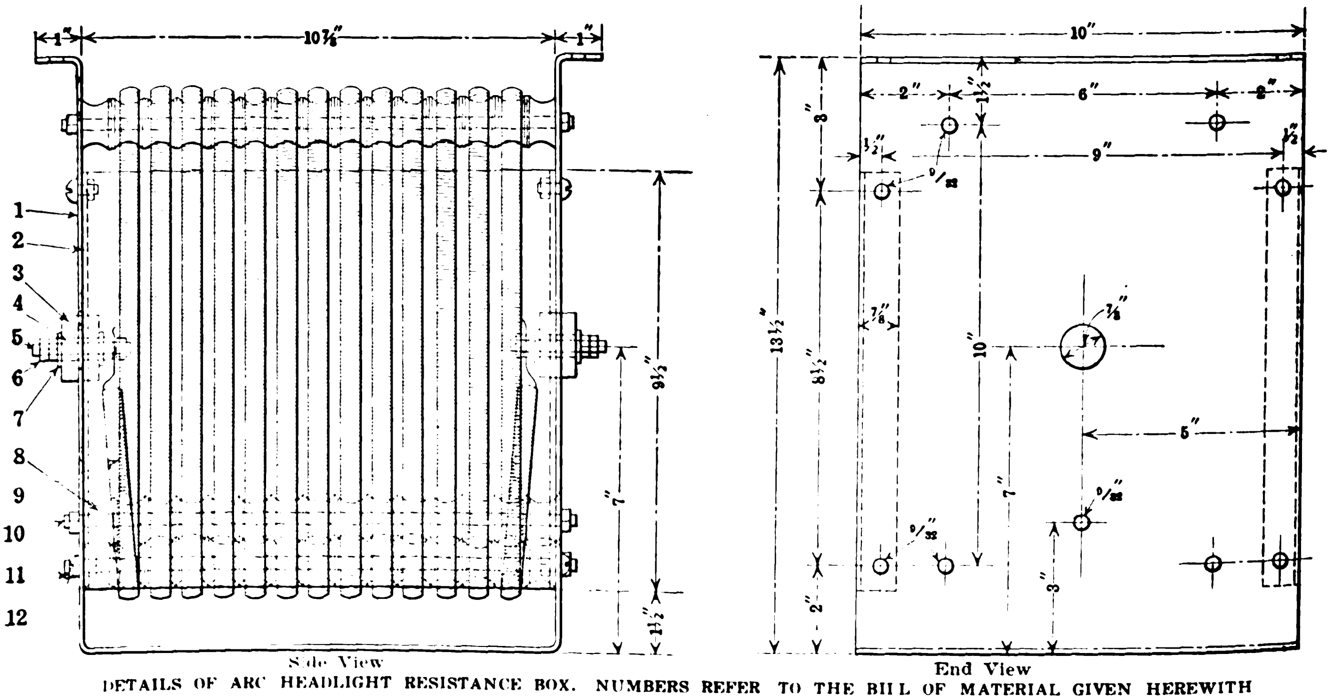
The cost of plush for recovering seats in coaches has increased considerably. Formerly, when the edges of the plush on seats became badly worn, we replaced the old plush with new. Recently, one of our men took two of these old seat backs, trimmed off the worn portions and sewed the remaining parts which were in good order together in such a way as to make one very good seat back. The only thing that indicates that this has been done is one vertical seam running up the center of the back. As the sewing together was done on a machine, the labor involved was but little more than would be required to recover the seat with new plush. We now have several cars with the plush seats repaired in this way.



VIEWS OF ARC HEADLIGHT RESISTANCE BOX

Bill of Material

Ref. No.	Number Required	Name	Material	Size of Stock	Remarks
1	1	Main frame	Sheet iron	No. 14x10 in.x39⅞ in.	
2	2	Side shield	Sheet iron	No. 14x9½ in.x12⅝ in.	
3	4	Bushings for terminal stud	Porcelain		Manufactured by Crouse-Hinds Co. Cat. No. HL 2796.
4	2	Insulating tube	Mica	¼ in. I. D. ½ in. O. D. x⅞ in. long	Manufactured by Crouse-Hinds Co.
5	2	Terminal stud	Brass	¼ in.x2 in.	24 threads per inch.
6	8	Nuts	Brass	¼ in. hex.	24 threads per inch.
7	4	Washer	Brass	¼ in. I. D.x⅞ in. O. D.	
8	75	Insulator	Porcelain	Height 11/16 in. Diam. 1⅛ in., hole ¼ in., groove ½ in.	Stand. No. 11, Trade No. 042, Union Elec. Co., Pitts., Pa.
9	5 coils	Resistance wire		No. 20. (23) ohms per coil	Marked 15-75 ohms for heater "31-K" manufactured by Consolidated Car Heating Co.
10	5	Tie bolts	Cold rolled steel	¼ in.x11½ in.	Threaded ¾ in. on each end.
11	10	Nuts	Iron	¼ in. square	20 threads per inch.
12	8	Stove bolts		¼ in.x1½ in.	Round head.

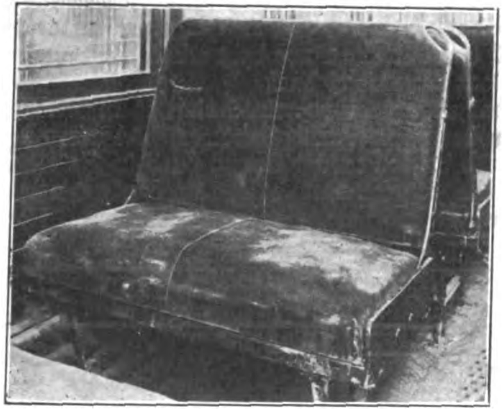


Side View End View

DETAILS OF ARC HEADLIGHT RESISTANCE BOX. NUMBERS REFER TO THE BILL OF MATERIAL GIVEN HEREWITH

On some of our plush seats having end arm rests and roll-top backs, the plush was in good order with the exception of that on the roll top. These seats were repaired by renewing the plush on the roll top only. If only one seat here and there is thus repaired, it makes a bad appearance, but if all the seats in any compartment are changed, the appearance is pleasing rather than otherwise, since they all look alike and the new plush on the top roll gives the impression that new seats have been put in.

On nearly all passenger coaches there are many parts now made of brass or bronze which could just as well be made of malleable iron. The basket racks have generally been made of brass rod and castings. These look very fine when carefully polished and lacquered, but when they become tarnished they do not look as well as painted or enameled work. On account of the heavy cost of repolishing and lacquering these basket racks, we simply have them painted or enameled, and in ordering new racks we have had them made of malleable iron castings and cold rolled steel rods, covered with baking enamel which will stay in good condition for years. This enamel is easily renewed if desired.



PLUSH SEAT REPAIRED, SHOWING SEAM IN THE MIDDLE

Peculiar Brooming of Poles

In some alkali regions a waterproof coating is necessary in the treatment of poles to prevent them from brooming at the ground surface. Due to the expansive action of the alkali a pole of Western cedar brooms to twice its natural size. It is found that cedar is more susceptible to this action than pine or cottonwood, probably due to the relative porosity of the woods.

Chicago Safeguards for Drawbridges

Details of Recently Installed Interlocking Derail Device and Cushion Barrier Gate Designed to Stop Surface Cars

BY F. H. AVERY
Engineer in Charge of Bridge Repairs, Chicago, Ill.

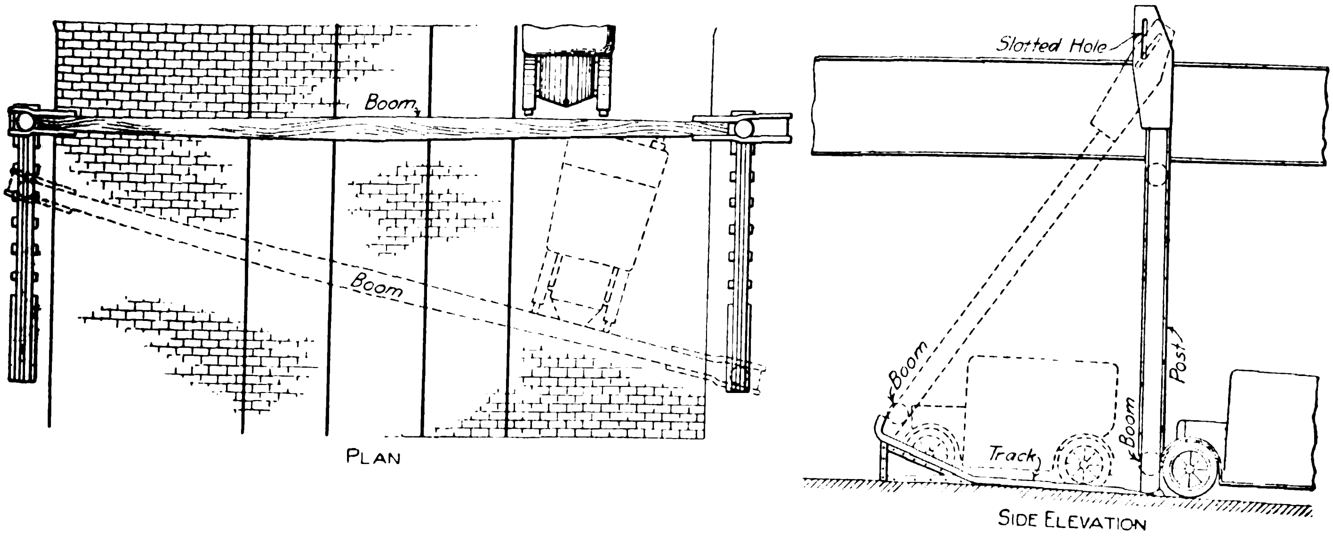
Chicago is striving to safeguard her traveling public by installing barrier gates, derails and stop signals at approaches to drawbridges. The most recent device, that of a cushion barrier gate, is designed to withstand the impact of a surface car or a 4000-lb. automobile traveling at 30 m.p.h. To protect the surface cars, derails are also being installed which interlock with the end lock of the span and prevent its release except when the derail itself actually opens.

The first gates were air-operated and could not be reversed quickly once they were started down, nor operated at all by the bridge tender in the case of a drawspan. The electrically operated gate avoids these two serious faults. In this gate, contactors consisting of wheel contacts that wipe against copper strips on the abutment are placed at the end of the center truss. This works very well, for after the bridge tender lowers his gates and makes his swing, he reverses his switches while waiting for a boat to pass, and as soon as the bridge is again centered on the abutments the gates rise automatically from the action of the contactors. The present gate arm is provided with a hinge and wooden pin at the curb line, so that when hit, the pin shears off and allows the arm to swing around without breaking.

CUSHION BARRIER GATE, LATEST DESIGN

The writer has designed and is installing at Lake Street Bridge a gate of the cushion barrier type, consisting of a boom which travels vertically on two posts at the curb line. These posts are free to swing at the top and slide at the bottom. When the boom is struck by a machine, the post rolls backward about a foot on a wheel placed at the bottom of the post. The motion then changes from rolling to sliding by means of a track which picks up the post on two bearings outside of the wheel. The post slides horizontally for 10 ft. and then climbs at an angle of about 45 deg. for 5 ft. more. To provide for the lengthening of the post which this motion requires, the support at the top on which the post turns has a slotted hole.

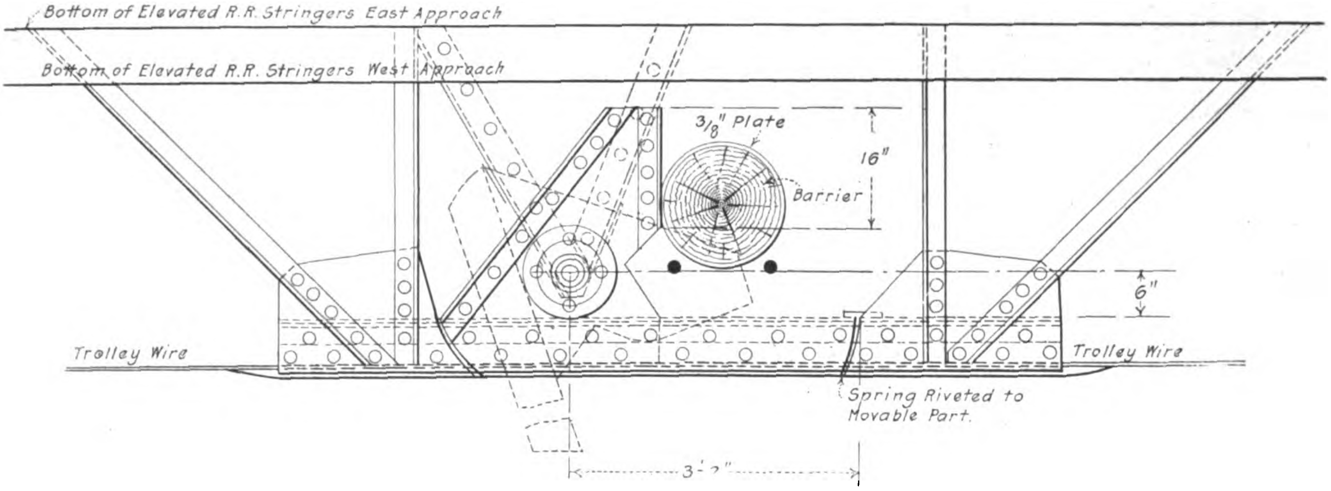
The boom is of Douglas fir, 16 in. in diameter, and it has forked ends so that when struck by a machine close to the curb, the post on that side can start independently of the opposite one, and the lengthening of the boom



BOOM LOCATED AT DRAWBRIDGE AND DESIGNED TO STOP STREET CARS AND AUTOMOBILES which this requires is provided by having the forked end made of 3-in. x 4-in. x ½-in. angles. The boom weighs 1000 lb. and the two posts with counterweights 3000 lb., making a total of 4000 lb. which must be put in motion when struck by a machine. The boom can spring 18 in. without breaking and the tires furnish additional cushion, so that the rolling motion should take place without damage. The resistance then increases, with the change to sliding friction, and the stopping action is still further augmented when it becomes necessary to lift the boom and posts a distance of 2 ft. vertically in the last 5 ft. of travel. There would still be left the 18-in. deflection in the boom. The gate is designed to stop a 4000-lb. machine going at 30 m.p.h. without injury to its occupants.

MOVABLE SWITCH FOR PASSING TROLLEY WIRES

When the boom is raised it must pass the trolley wires, which is accomplished by means of a switch that is operated by the motion of the boom. The movable portion of the switch is not dead at any time, so that a car cannot be stalled in case it stops with the trolley on the switch. The boom is fastened to the counterweights at each end by two cables so that the breaking of one will not allow the boom to drop on the traffic below. The boom is designed to withstand the impact of a street car, and has no springs, cylinders, or brake wheels to get out of adjustment. The cushion gate is just back of the electric gates which are lowered first, after which the barrier comes down.


Bottom of Elevated R.R. Stringers East Approach
Bottom of Elevated R.R. Stringers West Approach
3/8" Plate
16"
Barrier
6"
Trolley Wire
Trolley Wire
Spring Riveted to Movable Part.
3'-2"

MOVABLE SWITCH TO ALLOW BOOM TO PASS TROLLEY WIRES

A rigid gate would be much cheaper than a cushion barrier gate. However, a gate should prevent loss of life or injury if possible, which is not likely if a machine going at 25 m.p.h. is instantly stopped.

DERAILS PREVENT ACCIDENTS TO CARS

The street car on a swing or vertically lift span should be protected by a derail operated by the bridge tender and interlocked so that the span cannot be opened unless the derail is open.

The Clark Street derail in Chicago is so interlocked with the end lock of the span that the operator cannot pull out the end lock until the solenoid located in the operator's house raises the dog on the end-lock push rod. This solenoid is energized when the derail is open by an electrical switch located at the curb opposite the derail. This insures that the bridge end-lock is released only when the derail actually opens, as otherwise the operator, not being able to see the derail or its target, might throw the derail lever and, due to a broken rod, proceed to open the span with the derail untouched. The dog on the center lock is under a glass cover, but may be raised by hand in an emergency.

The most troublesome point in the pipe line of such a derail is at the abutment. It is hoped, however, to overcome some of the difficulties by using a spring at this point which maintains a constant pressure of about 300 lb. against the casting on the end of the push rod at the end floor beam of the span. This will take care of expansion and does not require unlatching or unhooking the pipe line at the abutment when a swing is made. If the operator closed the derail while his span was open, it would cause the breaking off of the castings at the abutment spring box. This is prevented by the bar between the end lock and derail levers in the operator's house, which is cross-connected to the derail lever, so that when the end lock is pulled after pulling the derail the derail cannot be pushed back again until the end lock is pushed back.

A signal should be so wired that it interlocks with the controller to the bridge motors. At every span in Chicago the bridge tender has to push in his vibrating-bell and stop-sign switch before he can get current to his controller to operate the main motors. However, provision has been made for the operator to still get current if the signal fails to work.

VARIOUS STOP SIGNS TRIED AT CHICAGO

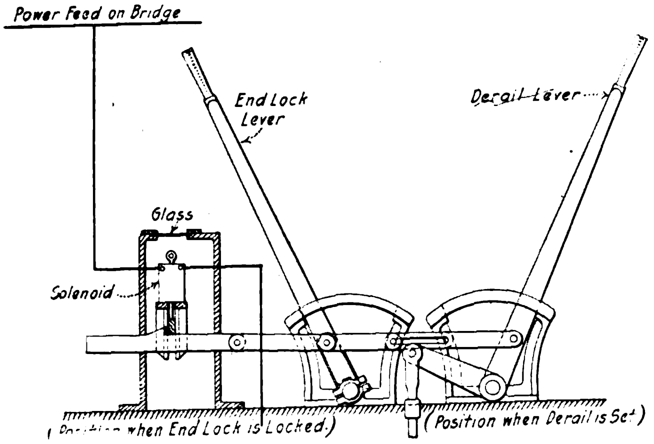
In Chicago a hand bell is rung as a warning to the traffic to clear the span so that it can be opened. Then a vibrating electric bell is rung, two electrically lighted signs are started on each approach and finally the gates are lowered before the span is opened. This should cause the oncoming traffic to stop, so that the only time lost is that required for the traffic to pass over the span, generally about one and a half minutes. However, several cases have occurred where machines have climbed a bascule leaf after it has started up. It is evident, therefore, that the stop sign must be very compelling in its effect on the public and of such a nature that people not familiar with it or not knowing where to look for it will see it instantly when it is displayed.

If signals were standardized all over the country the drivers would know a stop sign when they saw it All automobile magazines and clubs should aid in this, and it must be impressed on the driver that "STOP" means cease moving.

FLASHING SIGNAL PLACED ON GATES

The writer evolved the idea of placing the signal on the gate itself where it could be seen at any distance or position. The actual working out of the details of the first signal of this type was done by Mr. Harrington of the city bridge division.

The present stop sign is very substantially made of cast iron and placed so that it cannot be knocked down. A new type shortly to be installed will have the shape of ornamental pylons in accordance with the "city beautiful" idea. Four red lights placed on each arm are so arranged by means of a flasher that one light burns "STOP" at the curb. The signal then runs across the gates and the opposite stop sign lights up, after which the procedure reverses, thus giving the impression of a waving signal. Lights begin to flash while the arms are still in the up position. The visibility of the new signal is vastly superior to anything that has been produced for use at night, one of the chief features being that it cannot be hidden by traffic.


Power Feed on Bridge
End Lock Lever
Derail Lever
Glass
Solenoid
(Position when End Lock is Locked.)
(Position when Derail is Set)

INTERLOCKING LEVERS FOR DERAIL AND END LOCK

The accompanying table gives the costs installed of a complete set of signals for one trunnion type bridge.

GATES AND STOP SIGNS	
Four gate posts at $200	$800
Four stop signs at $70	280
Four gate controllers at $35	140
Two flashers at $75	150
Two vibrating bells at $20	40
Eight light sockets at $2.50	20
Total material	$1,430
Installation, seventy-five days at $6	450
	$1,880
EMERGENCY LIGHTS	
Two emergency lights at $5	$10
Two resistance plates at $10	20
Total material	$30
Installation, ten days at $6	60
	$90
CHANNEL LIGHTS	
Four swinging lights at $37.50	$150
Four pier lights at $7.50	30
Total material	$180
Installation, twenty-five days at $6	150
	$330
Total complete	$2,300

The work is being installed under the direction of Thomas G. Pihlfeldt, city bridge engineer, and city engineer, John Ericson.

Twenty-Five Dollars for a Safety Poster

The National Safety Council has announced that it will pay $25 for the best suggestion or illustration for a safety poster to popularize the International Safety Exposition which is to be held in New York during the week of Sept. 10, 1917. Any employee in the plant of a member of the council is invited to participate. Drawings and suggestions should be sent to W. H. Cameron, 208 South LaSalle Street, Chicago, Ill. The contest will close April 15.

A-Ladders Popular with Shopmen

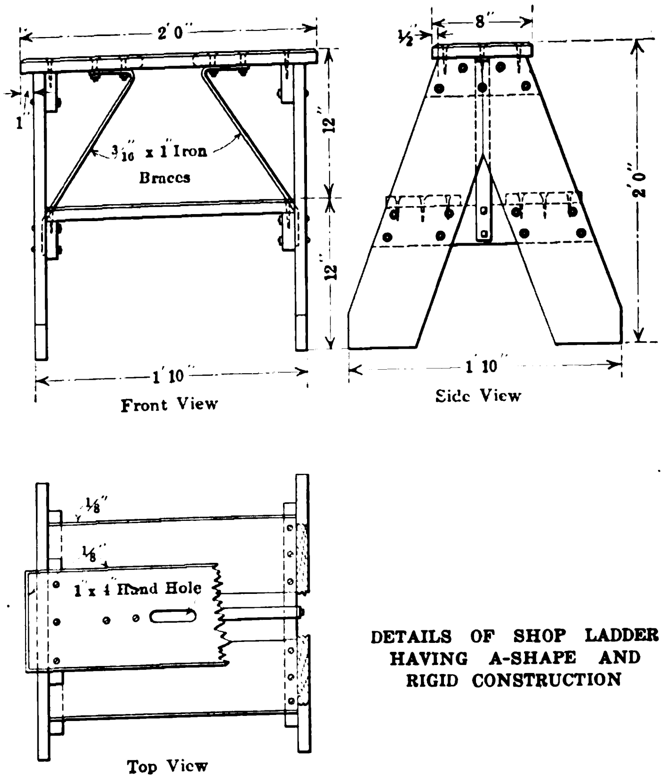
Found Useful in Carpenter, Paint and Truck Shops—Cost $2 Each

BY F. L. HINMAN

Master Mechanic New York State Railways, Syracuse Lines

In order to meet the demand for a portable device upon which a man could stand when working on parts of the car not easily reached from the floor of the shop or pit, a rigid A-ladder was designed and put into use about a year ago. This single ladder met with such popular favor that twelve additional ones were constructed at a cost of approximately $2 each and distributed throughout the carpenter shop for the use of men of that department. About six months ago twelve more of these ladders were placed in the pits of the truck shop, and these have proved equally serviceable in this class of work. In fact, the men of this shop appreciated the value of these ladders before the writer did, and it was due to the fact that several of the pit men appropriated carpenter shop ladders to their own use that it was decided to make up some expressly for the truck shop. Recently their use has been extended to the paint shop also.

Prior to the introduction of these ladders it was a common occurrence for men to work from the top of an empty box or possibly place two or more 6-in. blocks in the position needed, with the result that considerable time was consumed in hunting up something on which to stand, and often the device used for this purpose came a long way from complying with the rules of safety first. Since the ladders have been put into service, however, the employees have shown no tendency to use any other device for this purpose and, while no figures are available to show the actual time saved by the men, I feel safe in saying that during the first three months of their use the saving has been sufficient to pay for the cost of the ladders. Up to the present time there has been no maintenance charge whatever on the ladders placed in the carpenter shop, and these have been in service the longest.



Front View

Side View

Top View

DETAILS OF SHOP LADDER HAVING A-SHAPE AND RIGID CONSTRUCTION

In order to stop the practice of carrying the ladders from one shop to another, the ladders of the truck shop were painted black with white numbers on each end, and those of the carpenter shop were made gray with black numbers on the ends, while the paint-shop ladders are yellow with black numbers. By using this color scheme, a foreign ladder is instantly recognized by the foreman and returned to its proper shop.

The material used in each ladder is given in the following table:

One top board ⅞ in. x 8 in. x 2 ft.
Four legs ⅞ in. x 6 in. x 2 ft. 2 in.
Two steps ⅞ in. x 6 in. x 1 ft. 8¼ in.
Two cleats ⅞ in. x 3 in. x 1 ft. 6 in.
Two cleats ⅞ in. x 3 in. x 9½ in.
Two braces 3/16 in. x 1 in. x 1 ft. 9 in., iron.
Twenty-six ¼-in. x 2-in. R. H. stove bolts
Four 5/16-in. x 1½-in. F. H. stove bolts
Four 5/16-in. x 1½-in. machine bolts.
Eighteen 1¾-in. No. 10 F. H. bright screws
Fifty-two ¼-in. flat washers
Four 5/16-in. flat washers

Dump Cars Save $1,600 Per Mile

In Renewal Work in Cleveland the Author Estimates This Saving Over Manual Method of Handling Materials

BY C. H. CLARK
Engineer Maintenance of Way Cleveland (Ohio) Railway

That labor and time, and therefore money, can be saved by the use of the modern dump car in track construction is indicated by the following data. This company has had in operation for two years past a train of Differential electric dumping cars along with other dump-car and flat-car equipment. As a result of this experience the savings given in the table were compiled to show the effect of replacing the work cars entirely by the electric dump cars on a 20-mile renewal job.

The following comments indicate the bases for the calculation of the savings shown in the table:

TABLE I—SAVINGS ON 20 MILES OF SINGLE TRACK RENEWAL DUE TO USE OF ELECTRIC DUMPING CARS

Item No.	Operation	Unit Costs	Total Cost
1	36,000 cu. yd. concrete loaded at job	$0.05	$1,800
2	36,000 cu. yd. gravel unloaded at job	.25	9,000
3	18,000 cu. yd. paving stone loaded at job	.05	900
4	18,000 cu. yd. paving stone unloaded at job	.30	5,400
	Total		$17,100
5	36,000 cu. yd. earth and concrete unloaded at dump	$0.125	$4,500
6	36,000 cu. yd. gravel loaded at yard	...	....
7	18,000 cu. yd. stone unloaded at yard	...	....
8	18,000 cu. yd. stone loaded at yard	.05	900
	Total		$5,400
9	Four crews for 200 days	$5.50	$4,400
10	Transporting labor for unloading cars		4,800
	Grand total		$31,700

Item No. 1. On West Twenty-fifth Street, from Potter Court to Clark Avenue, the cost of loading concrete was 30 cents per cubic yard and of loading earth, 18 cents per cubic yard not including the crews. On June 29 the actual time taken in loading represented a cost of 25½ cents per cubic yard for loading concrete on flat cars and 35.1 cents per cubic yard for loading concrete on dump cars of an earlier type. The electric dump cars are lower than the flats, hence there would be a still further saving. Five cents per cubic yard was allowed.

Item No. 2. The cost of unloading all the gravel for the stretch of double track from Potter Court to Clark Avenue was 30 cents per cubic yard for labor only, other than the time of crews. With the electric dump cars the crews alone unload the cars and hence the entire amount of 30 cents per cubic yard should be saved. Five cents per yard is allowed for distributing gravel after it has been dumped from the electric dump cars. Under a different method of track renewal this might become an additional saving.

Item No. 3. On the same stretch of West Twenty-fifth Street it cost 27.8 cents per cubic yard to load stone on the older dump cars and 17.6 per cubic yard to load stone on the flat cars. The electric dump cars should load cheaper than either. Five cents per cubic yard saving is allowed.

Item No. 4. It cost 36 cents per cubic yard to unload stone on West Twenty-fifth Street by manual labor. The electric dump cars would be dumped by the crew only, hence the entire amount should be saved and only 30 cents was allowed. There may be some little distributing necessary after dumping.

Item No. 5. Flat cars are used largely for unloading earth and concrete at the dump. It is only fair to say that the saving might have been greater if the present practice of hauling laborers from the various field operations to the dump for unloading were abandoned. This might easily run as high as an additional 9 cents per cubic yard or for 36,000 cu. yd. at 9 cents, $2,340.

Item No. 6. No saving is allowed for loading gravel at the storage yard.

Item No. 7. No saving is allowed for unloading stone at the storage yard.

Item No. 8. Five cents per cubic yard is allowed for loading stone at the storage yard. (See Item No. 3 for this saving.)

Item No. 9. There are from twelve to sixteen crews at work in Cleveland during the renewal season. Since the trains of electric dump cars have twice the capacity of the flat cars and need much less time at the dump, it is assumed that eight to twelve crews could do the same work with the improved trains.

Item No. 10. The cost of transporting labor to and from the dumps and placing labor at the point of unloading cars on the job depends largely on the length of the haul and the local conditions at the job. It is conservatively estimated in this case at 9 cents per cubic yard, and it is assumed that one-half of the unloading is done without having to transport labor at all. The cost stated is, therefore, conservative.

In connection with the above data it should be noted that the savings shown are due partly to the ease of loading of the electric dump car and partly to the rapidity and ease of the dumping operation. In both of these operations the labor cost is comparatively low. An incidental advantage of quick dumping is that the movement of other equipment and crews using the same track is not delayed.

Stock of Repair Parts Reduced by Use of Interpole Motor

Author Gives Table of Extra Parts Necessary to Maintain 680 Motors of the Interpole Type—None of the Fields Have Required Replacing

BY J. S. MILLS
Foreman Electrical Department, Morris Park Shops, Long Island Railroad

There is nothing that has been done in recent years that is paying better dividends to electric railroad companies than the selection of interpole motors for new equipment or the re-equipping of cars which had old-type motors with interpole motors.

As an illustration, this company has 680 Westinghouse No. 308 interpole motors, the first of which went in service in the spring of 1910 and the last in the early part of 1914. We carry in stock the parts for these motors as indicated in the table at the top of page 509.

This includes our working stock of repair parts in shop and stockroom. This amount of stock has not in

Two main field coils, one open and one closed.
Two sets of steel springs and brass shields for main field coils.
One interpole field coil.
Two sets of steel springs and brass shields for interpole fields.
Two complete armatures.
Two sets of armature coils.
Three sets of armature coil clips.
Three sets of armature bearings.
One armature bearing housing pinion end.
Six armature bearing housing oil box covers.
Six sets of brush-holders.
100 to 200 brush-holder hammer tips.
100 to 200 flat steel springs for brush-holders.
25 ft. to 100 ft. of brush-holder shunt copper braid.
Six to twelve brush-holder stud porcelain insulators.
Four brush-holder bases.
200 to 500 carbon brushes.
Twenty-five to fifty sets of axle bearings.
Six axle cap housing oil-box covers.
One complete gear case.
Two bottom-half gear cases.
Three pinions.
Twelve gears on extra wheels.

any way interfered with the efficiency in maintaining these motors, and we have never had any cars held out of service waiting repair parts for these motors. I might further state that the original extra main fields and the extra interpole field are still in the stockroom. It has been necessary to retape some of the fields but none of them have been replaced.

Motor Maintenance at Providence

Successive Steps in the Insulation of Field Coils—Method of Storing Motor Repair Parts

The headquarters for railway motor maintenance on the system of the Rhode Island Company is the Cranston shops, just outside the city limits of Providence. Various features of these shops have been described in former issues of this journal, but little or nothing has been published regarding the success attained by the company in reducing operating troubles due to field coil defects, especially with the older motors. Instead of impregnating field turns before the sections are assembled, these are treated with a compound of shellac and whiting, combined with shredded asbestos and applied with a brush. The mixture is prepared by adding enough whiting to make the shellac a thick paste, to every 3 gal. about 2 lb. of shredded asbestos being added. This material is used on both cotton-covered and asbestos-covered wires. The various steps taken in the insulation of field coils for various types of motors are given below:

INSULATION OF FIELD COILS, GE-57, WESTINGHOUSE-93 AND 101
(Flat Coils Used)

1. Wind coil sections with asbestos paper between turns.
2. Apply shellac-whiting mixture with trowel or brush.
3. Place terminals.
4. Apply layer thin 1-in. asbestos tape.
5. Dip in insulating compound.
6. Dry in electric oven.
7. Apply 1-in. oiled linen tape (half-lap) twice around.
8. Apply layer 1½-in. field webbing.
9. Dip hot in heavy boiled oil.
10. Dry in oven and dip again.
11. Dry in air.
12. Apply brush coat of black insulating varnish.

INSULATION OF FIELD COILS, GE-800 AND WESTINGHOUSE-68
(Round Wire Used)

1. Wind coil in shellac and whiting compound, with a little shredded asbestos, brush applied.
2. Apply terminal when dry.
3. Apply 1-in. asbestos tape over fresh compound.
4. Dip in insulating compound and dry.
5. Apply 1-in. oiled linen tape.
6. Apply 1½-in. friction tape.
7. Apply 1-in. oiled muslin.
8. Apply 8-oz. canvas tape about 2 in. wide.
9. Apply 1.5-in. field webbing.
10. Dip hot in heavy boiled oil.
11. Oven dry and dip second time.
12. Air dry.
13. Apply coat black insulating varnish.

NOTE: GE-1000, 52, 80, 67 and Westinghouse-56 same as above but with No. 8 omitted. All tape is applied with one-half lap.

The foregoing construction prevents vibration between coil sections and is most effective in cutting down short-circuits between adjacent field turns.

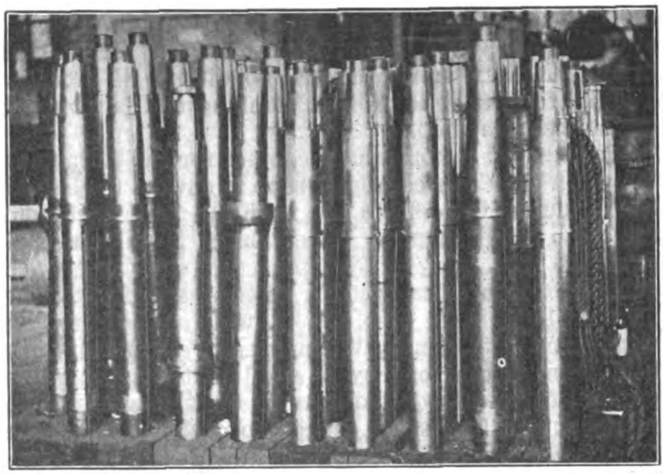


FIG. 1—ARMATURE SHAFT RACK, RHODE ISLAND COMPANY'S CRANSTON SHOPS

All flat field coils for railway motor service and magnetic blowout coils for controllers are passed through two case-hardened steel plates to "iron out" the roughness of the copper edges and prevent short-circuits from the resulting scattering of fine copper particles through the coils, particles which cannot as a rule be seen with the naked eye.

The above methods have been important factors in reducing motor troubles, so that whereas formerly about ten armatures used to be brought into the shop for repair weekly on account of troubles due to unsatisfactory field conditions, at present only one or two armatures come in monthly. The number of spare field coils carried has been reduced about 50 per cent.

STORAGE OF MOTOR PARTS

At the Cranston shops three notable means of compact storage are in use in connection with motor maintenance and the repair of other electrical equipment. Fig. 1 shows a convenient rack for the storage of armature shafts. These are mounted vertically in holes drilled in a 7-ft. x 8-ft. platform. A capacity of 120 shafts is attained in this exceedingly limited space, the holes be-

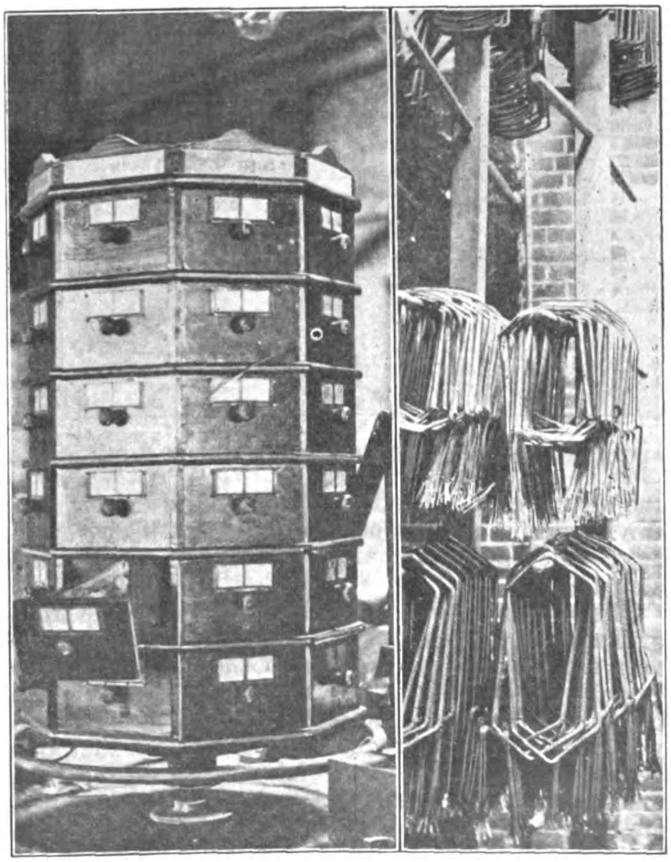


FIG. 2—SCREW CABINET; FIG. 3—ARMATURE COIL STORAGE RACK UNIT. BOTH IN RHODE ISLAND COMPANY'S SHOPS

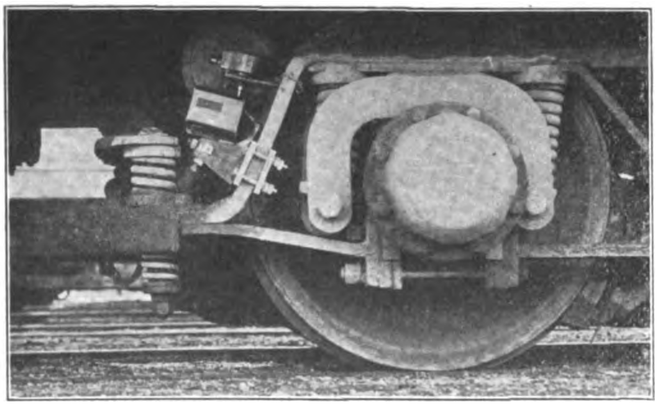
ing drilled in diameters ranging from 2½ in. to 4 in. Fourteen different types or sizes of shafts are carried in the platform under normal conditions of storage. The platform floor is of 1-in. planking and is mounted in the machine shop.

Fig. 2 shows a home-made cabinet for the storage of screws in the electrical repair shop to obviate the loss of time incurred in going to and from the main stockroom for these small supplies. The cabinet is an octagonal structure containing forty-eight triangular boxes with galvanized-iron sides, wooden bottoms and fronts, the drawers being 3 in. deep, 4½ in. wide at the base and with sides 6 in. long. When opened all drawers are held from falling out by a small vertical pin which projects downward at the apex of the triangle in each case, but which is short enough to enable a box to be taken out with ease by tilting downward from the front. The diameter of the cabinet is 14½ in., and the structure rotates on ball bearings, a hand-wheel for convenient manipulation being provided at the bottom. The cabinet holds from 10,000 to 15,000 screws.

Armature coils are stored at these shops upon unit racks as illustrated in Fig. 3. Eleven hundred coils can be stored in a space 15 ft. square and 12 ft. high. The unit racks consist in general of oak posts 3½ in. x 2¾ in. x 12 ft. high, provided with tapered oak cross-pieces ranging in diameter from 1 in. to 1½ in. from end to post seat, and extending outward about 30 in. on each side of the post.

Device for Measuring Car-Mileage Accurately

Among the new apparatus being perfected for railway work is a device for measuring the mileage traveled by a car wheel. It is known as the Ohmer odometer and is being developed by the Ohmer Fare Register Company of Dayton Ohio. This device, which is shown in the accompanying illustration, is designed to give railway companies an accurate means for figuring car mileages, which means increased accuracy in maintenance statistics.



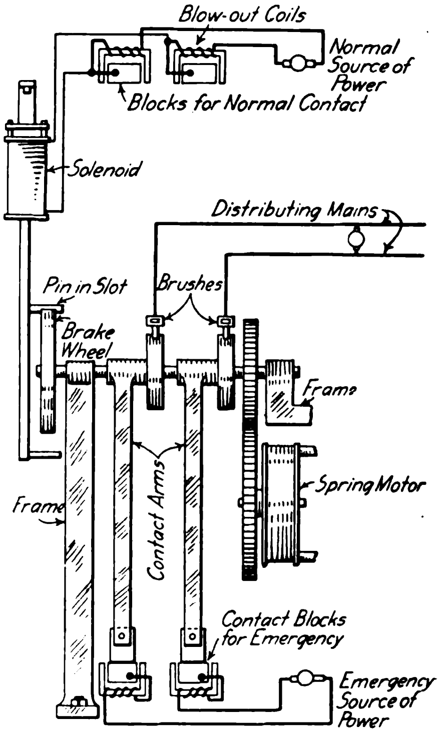
DEVICE FOR MEASURING THE MILES TRAVELED BY A CAR WHEEL

The odometer wheel is kept in contact with the tread of the car wheel by spring pressure. As the adjustment does not depend upon the size of the car wheel, inaccuracies due to the wear of the wheel are obviated. The odometer will indicate the miles traveled, no matter in what direction the car goes. It is expected that this device will serve a very useful purpose as the total mileage, including the travel in carhouse, on sidings, etc., will be included, thus rendering car mileage statistics really accurate. The device is not yet ready for the market, but is receiving severe tests preparatory to its manufacture.

Automatic Emergency Switch

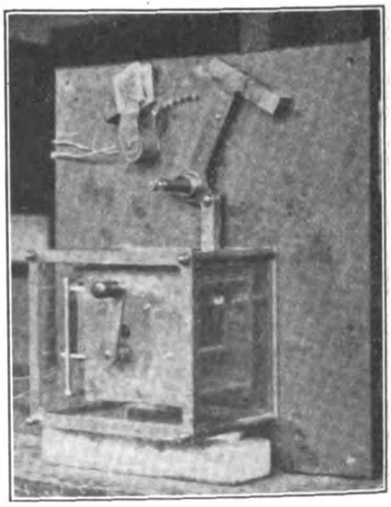
A New Switch Designed for Use in Boston Subway to Insure Continuity of Throw-Over Service on Lighting and Auxiliary Circuits

To provide a means of automatically transferring a lighting or power load to an alternative source of power in case of the failure or interruption of the normal source, John Hamilton, chief electrician Boston (Mass.) Elevated Railway, has devised and patented the switch illustrated herewith. The development of this apparatus arose from the requirement in the Boston subway and tunnel systems of an automatic means of providing for the supply of electricity to lighting and pump circuits in case of an interruption of the normal service.



SWITCH IN POSITION TO PROVIDE POWER IN EMERGENCY

The aim of the inventor of this switch has been to provide an apparatus of rugged and simple design. The equipment is an improvement upon the usual "double-throw" knife blade or lever type switch ordinarily used in connection with alternative power supply and generally operated manually. The operation of such switches manually requires time and, under some conditions, in the interval which may elapse before the attendant throws the switch, serious results may happen at the points of energy consumption, due to a loss of light in crowded inclosures, or a loss of power at critical moments on elevators, cranes, etc.



SWITCH FOR TRANSFERRING TO ALTERNATIVE SOURCE OF POWER

The new switch is designed to guarantee substantial continuity of electrical service at the point of consumption by operating automatically immediately upon the loss or failure of power supply from the normal points of contact. The switch automatically returns to its normal position immediately upon the re-energizing of the normal contacts and remains in position for repeated operation upon subsequent failures of power supply. The design also enables the switching transfer to be made automatically, if desired, upon a fall of voltage to a predetermined limit, with automatic restoration of service at the normal contacts as soon as the rated operating pressure is again supplied.

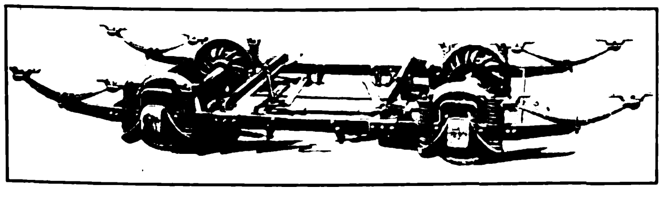
The apparatus consists fundamentally of a set of contact arms insulated from each other and mounted on a shaft rotated by a spring motor. The arms are arranged to transfer a load of lamps, or other power-consuming units, from one set of supply contacts to another, according to the position of a solenoid plunger actuated by a coil which is energized from the normal supply mains. If the normal source of power fails or if the voltage falls to a predetermined limit, the plunger falls, releasing a pin in the end of the plunger from a slot in the brake wheel and allowing the spring motor to rotate the arms. The fall of the plunger to the lower position causes another pin to engage the slot in the brake wheel, as shown in the accompanying diagram, when the arms (or single arm in some designs) reach the emergency contacts, locking them in position. In the direct-current equipment provision is made for the use of magnetic blow-out coils where the circuit is broken.

When the normal source of power is again established, the flow of current through the solenoid raises the plunger, which releases the pin above the brake wheel from the slot. The motor rotates the contact arm or the arms back to the normal source contacts, the lower pin being in a position to engage the wheel and lock the arms in contact in the normal position. The cycle may be repeated indefinitely. The winding of the spring of the motor becomes a regular duty of the attendant in the station or other locality where the apparatus may be in service. The operation of the switch is so quick that practically no change is noticed in the intensity of the illumination or the speed of motors in circuit with the device.

An installation of the switch is soon to be made on the Boston Subway system. On a test in the Boston Elevated wire department shop the switch easily broke a current of 150 amp. at 600 volts and was adjusted to operate on a pressure reduction from 550 to 450 volts.

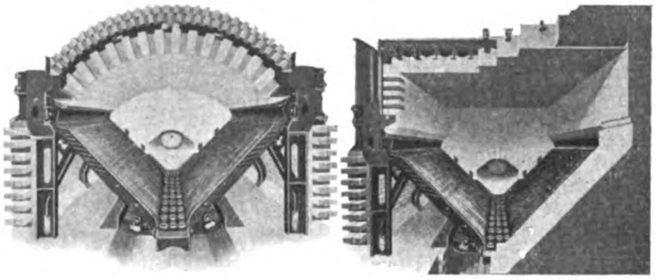
Light-Weight Truck for Single-Truck Cars

The J. G. Brill Company is building a new light-weight truck for single-truck cars to supply the present demand for light-weight equipment. This is known as the "Light-Weight" 21-E truck, and weighs 3700 lb., which is about two-thirds the weight of the Brill 21-E truck of similar design. It is designed to sustain a load of 17,500 lb. The truck has 24-in. wheels and an 8-ft. wheelbase. The small wheels, besides tending to lighten the equipment, permit a wheelbase 6 in. longer than would be possible with 33-in. wheels. Other features contributing to the reduction in weight are smaller axles and motors, and lighter springs and side bars. These are possible because the weights of car body and passenger load are somewhat less than those for which the other Brill 21-E truck was designed. In addition, a reduction of 300 lb. in weight was made by changing the brake rigging for inside instead of outside brakes.


NEW LIGHT-WEIGHT TRUCK FOR SINGLE-TRUCK CARS

Overfeed Inclined Grate Stokers

The V-type stoker shown in the accompanying illustrations is the latest development which the Detroit (Mich.) Stoker Company has made in the overfeed inclined grate type of stoker. Among the special features claimed for this stoker is the exceedingly large coking surface, which extends the full length of the furnace on each side and under the firebrick arch, producing an even distillation of the gases at a high temperature and eliminating the smoke. The stoker is operated on natural draft, which eliminates the necessity of fans or blowers and does not subject the stoker to a shut-down due to the failure of any of the auxiliary appliances. The steam required for the operation of the stoker is said to be less than 1 per cent of the total amount generated in the boiler.


REAR VIEWS OF "V" SHAPE AND FLAT SUSPENDED ARCH-TYPE STOKERS

In connection with this stoker the manufacturer has recently developed the Detrick flat suspended arch, which is said to have several advantages over the old type of sprung arch. Although the first cost is considerably more than for the sprung arch, the lower maintenance cost will offset this disadvantage, it is claimed. The suspension is of the pendulum type and permits of free expansion and contraction, which eliminates stresses and strains common to some types of arches. Repairs or renewals to the arch are easily made by replacing as many tiles as are necessary without disturbing the remainder of the arch. The side walls below the arch can be replaced or repaired without disturbing the arch or any of the iron work. The supporting beams and hangers are ventilated by the air, which is admitted through the stoker fronts, passing between the arch tile and the arch roof, thus preventing them from overheating.

Buckstays are not required, there being no side thrusts, as the whole weight of the arch rests on the stoker iron work entirely independent of the brick work. With this type of arch it can be placed at any height to supplement the boiler baffles in forming an unrestricted path for the travel of the gases. After being drawn in through the stoker fronts the air passes downward through the tuyere openings, where it mixes with the gases distilled from the coal. This mixture of combustible gas which, coming in contact with the highly incandescent furnace arch, is completely burned.

Coal is stored on top of stoker and feeds by gravity through the magazine on both sides to the grates. The fuel bed moves down toward the center of the furnace and the ash and clinker are ground through the clinker crusher and drop into the pit below. The continuous movement of the vibrating grates and the constant operation of the clinker crusher keep the fire clean.

News of Electric Railways

Traffic and Transportation
Financial and Corporate Personal Mention Construction News

Indiana Tornado Damage

Loss to Electric Lines Very Slight—Efficient Service by Them in Rendering First Aid—Their Mobility Demonstrated

Indiana interurban lines proved of inestimable value in bringing prompt relief to the stricken city of New Castle, Ind., which was devastated by a tornado on Sunday afternoon, March 11. The tornado struck the city from the northwest, and the severest blow was felt in that part of the city populated by employees of the factories and mills. More than two hundred homes, a rolling mill and many other buildings were destroyed. The number of dead was reported as twenty. More than one hundred others were more or less severely injured. The tornado swept through the town shortly after 3 o'clock, but the first intimation to reach the State authorities was a telegram received by Governor Goodrich shortly before 5 o'clock. The overhead lines of the Terre Haute, Indianapolis & Eastern Traction Company were blown down in a space of about four squares, but the company, which operates a branch line to New Castle from its Indianapolis-Richmond line, was operating to the city limits. The wreckage was cleared away and the line operated through to the interurban terminal by noon Monday. The Union Traction Company of Indiana, which operates a through line from Indianapolis to Muncie and Fort Wayne via New Castle, had the roof blown off its carhouse, but its lines being in the northern part of the town the property of the company did not suffer from the storm.

THE RAILWAYS HELP

Adjutant-General Smith of the Indiana National Guard received a call for State troops, physicians and nurses to aid the afflicted city. The Terre Haute, Indianapolis & Eastern Traction Company was requested at 6.45 p. m. Sunday to transport a company from Crawfordsville to Indianapolis and thence to New Castle. A special train was ready for loading at Crawfordsville at 7 p. m. The regular limited schedule from Crawfordsville to New Castle is three hours and forty-five minutes, but there is no regular through service. The special made the run in two hours and fifty minutes. A relief train over the Union Traction Company's line left Indianapolis at 7.20 p. m., carrying about eighty-five nurses and physicians. Battery A of Indianapolis was transported to New Castle at 7 o'clock Monday morning in a special over the Terre Haute, Indianapolis & Eastern lines, and this same system operated a through train from Terre Haute to New Castle Monday afternoon, conveying Company V of Terre Haute. Detached relief parties, supplies, etc., were handled continuously in the regular service operated over both the Terre Haute, Indianapolis & Eastern lines and the Union Traction system.

MOBILITY OF INTERURBANS DEMONSTRATED

The emergency which arose in the New Castle disaster, and was so promptly met by the electric lines, is a timely illustration of the sentiment expressed at the meeting of the Central Electric Railway Association in Indianapolis on March 8 and 9, when a message was sent to President Wilson offering the services of the interurban railways for the transport of troops, equipment and supplies in case of war. It also demonstrated the inestimable advantage and mobility of the interurban lines in cases of necessity, and justified the hopes expressed by Adjutant-General Smith of the Indiana National Guard at a luncheon given to the Central Electric Railway Association membership at the recent meeting that in case of war or other necessity the interurban railroads would be of great advantage to the State and the Federal Government.

Strike in Washington

Washington Railway & Electric Company Issues Individual Contracts—Company Determined to Uphold Loyal Men

The employees of the Washington Railway & Electric Company, Washington, D. C., are on strike. They went out on Monday morning, March 12. The company was quick to fill the places of the strikers, and as far as it is concerned the strike is over. Still, the possibility of complications is present because of the peculiar political organizaton of the district, the government of which is vested by Congress in a commission of three members.

The strike followed the expiration of an agreement reached a year ago between the Washington Railway & Electric Company, the Capital Traction Company and other companies when the labor men organized the railway employees of the District of Columbia. Much of this agreement was informal. Certain questions involving the recognition of the union, on the part of all the companies operating in the District of Columbia, came up again as the main point, although they were supposed to have been settled a year ago.

The Capital Traction Company after a long period of negotitaions made a collective bargain with its men. This the Washington Railway & Electric Company refused to do.

The demands of the Amalgamated Association were presented to the Washington Railway & Electric Company on Feb. 23. Among them, as stated previously, was one requiring all employees to join the Amalgamated Association. The company promptly rejected this. In a statement to the public the company said that it would be as false to its faithful employees as it would be untrue to the public and itself if it submitted to any such demands. The company was firm in the belief that the Amalgamated Association promoted disorder, disloyalty and lack of discipline. The company would never discharge from its employ at the behest of officers of a tyrannical association employees who had served the company faithfully for years. For this reason the company chose to deal direct with its individual trainmen. These men were asked to sign an individual contract for three years effective from March 12, 1917. The new wage scale as provided in the individual contract was as follows:

Men in continuous service less than one year, 24 cents an hour; second year, 25 cents an hour; third year, 26 cents an hour; fourth and fifth year, 27 cents an hour; sixth and seventh year, 28 cents an hour; eighth, ninth and tenth year, 29 cents an hour; ten years and thereafter, 30 cents an hour. The previous wage scale was 23½ cents an hour for the first year; 24½ cents an hour for the second, third, fourth and fifth years; 25½ cents an hour for the sixth, seventh, eighth, ninth and tenth years, and 27 cents an hour after ten years. Under the new individual contracts, therefore, the wage increase was as follows: First year increase ½ cent an hour; second year, ½ cent; third year, 1½ cents; fourth year, 2½ cents; fifth year, 2½ cents; sixth year, 2½ cents; seventh year, 2½ cents; eighth year, 3½ cents; ninth year, 3½ cents; tenth year, 3½ cents; ten years and thereafter, 3 cents.

The new contract provides for grievances to be taken up at the office of the superintendent on the second and fourth Tuesdays of each month. An appeal from the decision of the superintendent in any case may be taken on the third Tuesday of the month direct with the president of the company. Grievances not satisfactorily disposed of in the manner mentioned can be referred to the Public Service Commission of the district for final decision. The commission just mentioned will be a permanent board of arbitration in all questions referred to it under the provisions of the contract. The presentation of any grievances, however, is to proceed under the direct charge of the complaining employee or mployees or a committee of employees.

The company is determined to carry the question at issue to a conclusion. Clarence P. King, president of the company, has reiterated repeatedly the purpose of not giving in to the union. In a statement which he made on March 12, and which appeared in a local paper, Mr. King said:

"To recognize the union would be to surrender. It is easy enough to surrender. It simply means throwing all principles to the wind. We intend fighting for our loyal men as long as there is any energy in us. We intend to bring about a condition by which there wll be no more strikes. We shall go right on protecting our loyal men and doing the many things that we have done for them. We do not intend to recognize the men who fomented the trouble."

Managers of connecting railways coming into Washington do not wish to become involved in any collateral issues which may grow out of the strike. It is understood that almost all of the employees of the Washington & Virginia Railway have signed the individual contracts which have been accepted by the men who are now operating the cars of the Washington Railway & Electric Company. The Washington, Baltimore & Annapolis Railroad has just signed a contract with its employees for three years.

Ouster Suit Begun

The city of Omaha, Neb., has brought suit against the Omaha & Council Bluffs Street Railway in the District Court at Omaha for possession of a large portion of tracks, cars and other property of the company under the reversion clause of the territorial legislative franchise of 1867 to the Omaha Horse Railway, which the city contends expired on Jan. 1, last. In the event that possession of the properties is refused the city asked an accounting of the use of its interest in them, since Jan. 1, a physical valuation of its interests and a money judgment for their value.

Counsel for the company reported recently to G. W. Wattles, president of the company, with respect to the claim of the city to the reversion of the property of the Omaha Horse Railway. In his conclusion counsel said that if the city should undertake to interfere with the property or franchises of the company the company should insist on the full limit of its rights under the street railway act of 1889, to wit: "to hold said property and franchise in perpetuity."

The reply of counsel for the company to the officers with respect to the demand of the city was referred to in the ELECTRIC RAILWAY JOURNAL of Jan. 20, page 131.

Dynamiter Sentenced to Sing Sing

Michael J. Herlihy, financial secretary of the local association organized by the Amalgamated among the New York subway employees, was sentenced on March 13 in the Criminal Branch of the Supreme Court to a term of from ten to twenty years in Sing Sing for dynamiting during the strike in New York last year. Herlihy was arrested on Nov. 3, 1916, as mentioned in the ELECTRIC RAILWAY JOURNAL for Nov. 11, 1916, page 1034, on a charge of having attempted to blow up the Lenox Avenue subway at the 110th Street station. The dynamiting resulted in the injury of two persons. It was testified at the trial on March 8 that statements made in speeches of the labor leaders encouraged acts of violence when arbitration seemed impossible. In passing sentence Justice Tompkins said the charge was a particularly serious one because Herlihy was well aware that many thousand people constantly used the subway. Six other members of the union were indicted on similar charges.

On March 14 James J. Merna and William Molsky, alias McCord, former subway guards, pleaded guilty before Supreme Court Justice Tompkins of participation in the bomb explosion in the 110th Street station of the subway last November. Merna told Assistant District Attorney Weller they also intended to place a bomb in the subway at Times Square and had received $100 from Benjamin Hamilton, who is indicted, to buy the explosives for Times Square. Merna and Molsky were to be sentenced on March 19.

Herlihy turned State's evidence on March 15 and disclosed the details of the bomb explosion. The confession came at a dramatic moment. George Pollock was on trial for complicity in the plot. His attorney, Louis Fridiger, who was also counsel for Herlihy, moved on March 14 that the case be dismissed for lack of evidence. Justice Tompkins adjourned court until March 15 when he was to announce his decision. When the court opened, Assistant District Attorney Weller, who is prosecuting the case, asked permission to place a witness, who had not before been available, on the stand. Herlihy was the man. He testified that the conspiracy was hatched in union headquarters about a week before the explosion, and charged that the dynamiting was suggested by James J. Murtagh and a man he knew as James McCord, who was indicted under the name of William Molsky. As stated previously McCord and Molsky both entered pleas of guilty on March 14. Herlihy testified that the conspirators went to Pollock, who had charge of the funds collected for the striking carmen, and demanded $50 of him. The plotters then went out of town and purchased dynamite, caps and fuses. Early on the morning of Oct. 25 they returned to New York with the dynamite in a suit case.

Railroad Improvement Storm Center

Sigfried Cederstrom, real estate expert for the Public Service Commission for the First District of New York, tendered his resignation on March 10, charging that the commission after receiving from him a preliminary report had refused to permit him to complete appraisals of land values involved in the New York Central Railroad's proposed changes and electrification on the west side. His preliminary report, Mr. Cederstrom asserted, had shown that the bases for the appraisal already made for the committee on port and terminal facilities of the Board of Estimate were misleading and grossly disadvantageous to the city.

Public Service Commissioners Hayward, Whitney and Hervey decided not to accept Mr. Cederstrom's resignation, but to dismiss him if he failed to make good some of the charges contained in his letter.

When he was cross examined on March 12 by Acting Chairman Hayward and other members of the commission, Mr. Cederstrom admitted that he had not understood all of the circumstances and that if he had known some of the facts brought out at the hearing on March 12 he might not have severed his connection with the commission. In view of this admission the commission made no attempt to discipline Mr. Cederstrom, but accepted his resignation without comment.

On March 12 Senator Brown told Controller Prendergast of New York City that Governor Whitman was preparing to call a conference of legislative leaders on the New York Central improvement matter. The request leading up to the proposed conference came, it is understood, from the New York City authorities. Mayor Mitchel and other members of the Board of Estimate are understood to be prepared to accept without protest an investigation of the entire matter by a legislative committee.

Tayler Franchise Renewal

Councilman Reynold introduced an ordinance in the Council of Cleveland, Ohio, on the evening of March 5, as the first step toward the renewal of the Tayler franchise. Although the franchise does not expire until 1934. it provides for renewal fifteen years before expiration if the city intends to retain control of rates of fare and operation. This renewal would have to be made by 1919 to comply with the provision. The Reynold ordinance authorizes the Council to fix terms and conditions of the renewal grant, regulate the rate of fare and transfers and terminate existing contracts. This may necessitate a revamping of the entire question before a renewal is made.

In order to settle the East Cleveland franchise matter, it has been proposed to enact legislation that will make the city limits the boundary line for low fare. However, East Cleveland has a contract that will give it the same rate as is maintained on this line within the city and this continues for about five years. The Hayden Avenue franchise expires within a few months.

Commission Opposes Court Review

Asks New York Legislature Not to Pass Bills Providing for Review of Commission Orders by the Court

The Public Service Commission for the First District of New York has sent to Chairman Charles D. Newton of the Senate committee on codes and to Chairman Frederick M. Ahern of the same committee in the Assembly a memorandum setting forth its objections to the Martin bills, which provide that the courts may review decisions of the commission. It is contended that a recent decision of the Court of Appeals was to the effect that orders of the commission should be final unless they violated some existing statute of the State Constitution. The memorandum of the commission says in part:

"These bills would set aside the decision of the Court of Appeals in that they specifically provide for a review of the facts, and are undoubtedly the answer of the public service corporations to that decision.

"The commission was established for the purpose of obviating the difficulties of court litigation and for securing remedies which the courts lacked either the power or the machinery to grant. It was, therefore, proposed that, without depriving any interested party of the right to review the commission's decisions, the procedure for such review should be limited so as to involve a minimum of interference with the enforcement of the just orders of the commission.

"This proposal aroused strenuous objections by the public service interests, and, as a compromise, the companies were left to every existing legal remedy for reviewing a decision by a quasi judicial administration board, such as is the Public Service Commission; but the Legislature was careful to provide that every order of the commission should continue in force, unless such order be unauthorized by this chapter or any other act, or be in violation of a provision of the Constitution of the State or of the United States, intending thereby that the judgment of the commission in making the order should be final, unless the order violated the statute or the Constitutions.

"In the litigation before the courts instituted by the companies to overthrow orders of the commission, there ensued a struggle, which continued for more than eight years, as to whether the judgment of the commission on questions of fact in matters confided by the Legislature to its regulation, or the judgment of the court, should prevail. Finally, on Oct. 3, 1916, upon an appeal involving an order requiring a gas company to extend its mains to a territory without gas service, the Court of Appeals reversed a decision of the Appellate Division of the Supreme Court and reinstated an order of the commission."

The opinion of the Court of Appeals is made a part of the memorandum, and then it reads:

ESTABLISHED SYSTEM THREATENED

"So fraught with danger to the established system of regulation of public service corporations in this State was the assumption by the lower court of right to substitute its judgment for that of the commission upon matters of fact, that the Court of Appeals finally and emphatically condemned this assumption. On the other hand, the companies did not underestimate the importance of this matter, for while the decision involved only one company, immediately after it was rendered all the large gas and electric light companies in this State combined to apply for a rehearing before the Court of Appeals and filed briefs in support of such an application. The motion was, however, denied, and the question finally settled as above indicated.

"The bills, as will be clearly seen, would reverse the decision of the Court of Appeals and vitiate the principle which it recognized as firmly established. In the language of the Court of Appeals, they 'will seriously hamper the commissions in the discharge of their duties, and go far toward defeating the efforts of the Legislature to establish agencies to regulate the great public service corporations.' Those who have an interest in just and effective regulation of public service corporations for the benefit both of the public and the companies themselves, should be aroused to the menace which the bills involve to such regulation."

Dallas Franchise Complications

Mayor Lindsley, a Candidate for Re-election, Attacks Grants He Helped to Prepare—Messrs. Strickland and Hobson Reply

The traction and lighting franchise situation in Dallas, Tex., appears to be more complicated than ever, instead of on a fair way to settlement, as was thought when the model service-at-cost franchises were drawn several months ago. Under the proposed new franchise two new companies were to be organized. One was to be headed by C. W. Hobson to take over and consolidate the street railway lines of Dallas and Oak Cliff under one management. The other was to be headed by J. F. Strickland to take over the Dallas Electric Light & Power Company, and furnish electric current for lighting, power, heating, etc., to the city. These franchises were drawn after the city had employed E. W. Bemis, utility expert, to fix valuations of the street railway properties and the electric lighting system, and after extended negotiations between the city and the men who were organizing the companies that were to take over the properties. These negotiations were carried to the point where an agreement for a lease contract by which Stone & Webster, owners of the Northern Texas Traction Company, would lease the Oak Cliff lines to Mr. Hobson's company. After an agreement had been reached the City Commission passed the ordinances granting the franchises as prepared and agreed on. The City Commission later arranged to submit the grants to the voters on April 3.

At first it appeared that all were agreed, and the franchises would be overwhelmingly approved. There has been a political shake-up, however, and Mr. Lindsley has become a candidate for re-election. The franchise situation has apparently changed. Mr. Lindsley, instead of supporting the franchises which he helped to draft and helped to negotiate to an agreement with the owners, has come out against them.

In order to present the issues as they appear to the properties involved under the franchises and from the standpoint of the men who had tried to effect the reorganization of these properties, Messrs. Strickland and Hobson have issued a statement in which the negotiations and the agreements thereunder are reviewed at length. They concluded this statement in part, as follows:

"If our commitments to reorganize and refinance the lighting and traction properties of this city had been made only to the Mayor, we feel sure, under existing circumstances, that our commitments with propriety might be withdrawn. The burden of financing these properties, with impending war conditions, is much greater than it was at the time the commitments were made. We feel, however, that our good faith is pledged to those members of the Board of Commissioners who have announced their intention of supporting the franchises on a referendum and to the people of Dallas to go forward with the enterprise of localizing the management of these properties, and we shall not withdraw unless the people of Dallas indicate their disapproval of the franchises.

"If there are influences in this city of sufficient power to prevent the settlement of these franchise problems, which for years have handicapped the growth of the city and ruined the credit of the properties, then those same influences are likely to prevent the successful operation of these public utilities under any franchise and we prefer not to assume the responsibility of inviting capital, either at home or abroad, to invest in them.

"Our attitude toward the settlement of these franchise questions has not changed from the time the Mayor invited us to undertake the reorganization of the public utility properties of Dallas.

"The Mayor would repudiate now the franchises which were drawn under his direction and agreed to by us. If the Mayor's present attitude is simply a change of mind upon his part, he certainly should do us the justice frankly to say so. If, on the other hand, he has all along been of the same mind and was, in fact, against the franchises, then the conclusion must be that he has been trifling not only with us, but the people as well.

"We are glad that on April 3 we shall have a commitment from the people of Dallas in which we can put our faith."

$1,273,779 for Track Renewals

Cleveland Railway Seeking to Expend That Sum During 1917—Negotiating for Renewal of East Cleveland Franchise

At the regular meeting of the City Council of Cleveland, Ohio, on March 12, a communication from J. J. Stanley, president of the Cleveland Railway, was filed, asking for authority to expend $1,273,779 on track renewals this year. This would cover the renewal of about twenty-eight miles of track. Chairman Reynolds of the street railway committee and several other members of the Council are said to be opposed to so great an expenditure at this time, because of the high price of materials. Fielder Sanders, street railway commissioner, has also expressed opposition to the program for the same reason.

EAST CLEVELAND FARES

The Cleveland Railway and the city of East Cleveland are negotiating in earnest over the renewal of the franchises in that place. The Hayden Avenue franchise expires within a few weeks, but the Euclid Avenue grant has some years to run. It is the desire to renew the grants together and also provide for the extension of the Superior Avenue line to Euclid Avenue. An agreement has been reached to the effect that the term of the franchise for the three lines shall be twenty-five years from the date on which it takes effect and that service shall be given according to a standard to be included in the franchise. President Stanley said he would agree to any one of the following provisions relative to the rate of fare: Five cents cash fare, free transfers, and 3 cents local fare in East Cleveland. Five cents cash fare, free transfers, or six tickets for a quarter with 1 cent charge for transfer on ticket fare. Five cents cash fare and free transfers, or five tickets for 20 cents with 1-cent transfers on tickets, the ticket arrangement to be abandoned and the universal fare to become 5 cents with free transfers at any time that the Cleveland fare goes to the highest rate in the Tayler franchise. Mayor Minshall of East Cleveland asked that an arrangement of this kind be made with the maximum fare at 4 cents.

Mr. Sanders suggested an initial rate of 4 cents for East Cleveland, with provision for a readjustment. He does not want the readjustment in East Cleveland to depend upon the increase in Cleveland. Mayor Minshall is endeavoring to secure Peter Witt as the representative of East Cleveland in arranging the rate of fare.

$200,000 Strike Damage Sought

The Springfield (Mo.) Traction Company has filed in the Circuit Court at Springfield a suit against the city in which $200,000 damage is sought. The Mayor and the chief of police are made defendants. The company alleges lack of protection to its property during the strike of its employees, the failure to settle which was reviewed in the ELECTRIC RAILWAY JOURNAL of March 10, page 452.

The company maintains in its allegations that upon the calling of the car strike on Oct. 5, 1916, it "became the duty of the city, through its officials, to afford the company adequate and complete protection under its franchise as a taxpayer of the city." It further asserts that not only should its property be protected, but that personal security should be given its employees with a view of instilling into the general public a sense of safety and security in riding the street cars. It is then charged that both Mayor Gideon and Police Chief Ratthbone "utterly refused and failed to so afford said protection." Lastly, it is generally alleged that by the failure of the city to give police protection the operation of the street cars was interrupted, the cost of operating them was increased, the property was damaged and the value of the franchise depreciated. Judgment for the full amount is asked.

On Oct. 10, 1916, Judge Pollock of the Federal Court granted a writ of restraint preventing interference with the operation of the cars of the company. He said at that time it was evident that some of the members of the police department were in sympathy with the striking employees of the company and that the disciplining of these men was a matter for the city authorities.

Sympathetic Strike Condemned

President of Printers' Union Characterizes Effort in That Direction in New York as Disreputable, Dishonest and Illegal

Marsden G. Scott, president of the International Typographical Union, in an editorial in the March issue of *The Typographical Journal*, the official paper of the International Typographical Union of North America, charges that the contract between the International and the American Federation of Labor was "deliberately, flagrantly and wantonly" broken during the street railway strike in New York City last September when the general sympathetic strike was called. Mr. Scott said in part:

WHAT PRESIDENT SCOTT SAID

"That the contract between the International Typographical Union and the American Federation of Labor was deliberately, flagrantly and wantonly broken in New York in September last is established by the fact that a strike order was issued by the Central Federated Union without consultation with the officers of this International Union and without their having agreed to such action. There can be no argument as to the intent of Sec. 5, Art. xi, of the contract between the International Union and the American Federation. There can be no denial that the contract was violated when this illegal strike order was issued.

"President Gompers tells us that he personally attended a meeting of these Federation lawbreakers and contract abrogators, and that they told him to his face that they would not accept his recommendations. This meeting was held on Sept. 10. Thirteen days later the illegal strike order was promulgated. What steps had been taken meanwhile by President Gompers to compel the observance of the contract between the American Federation of Labor and the National and International Unions? He dictated a letter, and stuck a special delivery stamp on it! And for this inefficient service President Gompers receives a salary of $7,500 a year and traveling expenses.

"Fortunately for the organized wage-earners of America, the men who hold the executive positions in the big international unions fully realized the disastrous consequences which would inevitably follow obedience to the illegal strike order. Since the president of the American Federation of Labor had failed to compel observance of the laws of the Federation, and since it was apparent that the executive officers of the Federation intended to take no official action to prevent an impending disaster, the executive officers of these international unions unhesitatingly issued the emphatic instructions which nullified the illegal strike order issued by the Central Federated Union.

"No, Mr. Gompers! The general sympathetic strike was not prevented by your letter with its special delivery stamp. This disreputable, dishonest and illegal sympathetic strike was prevented by the executive officers of the international unions, and not by the officers of the American Federation of Labor, who not only permitted the illegal strike order to be issued, but also permitted one of their salaried officers to act as chairman of the 'conference' which deliberately violated one of the fundamental laws of the Federation.

ANOTHER WORTHLESS SCRAP OF PAPER

"It is apparent that the constitution of the American Federation of Labor has become a worthless scrap of paper. The contract with the national and international unions has been violated, and the officers of the Federation apparently do not intend to give any assurances that they will even attempt to compel the observance of the law in the future. Once more the organized wage-earners will be compelled to pay dearly for the fruits of incompetent leadership. Meanwhile the executive offices of the International Typographical Union will continue to be located in Indianapolis. For the benefit of the soldiers of fortune, the political panhandlers and the mental cripples with which the trade-union movement is afflicted, it may be definitely and emphatically reiterated: There is no authority in the American Federation of Labor building in Washington, or under the hat of any American Federation of Labor officer, elected or appointed, to order members of the International Typographical Union to suspend work."

Increase in Wages Announced.—Advances in wages ranging from 7 to 10 per cent will go into effect on the lines of the Indianapolis, Columbus & Southern Company, Columbus, Ind., on April 1.

Bill for Center-Aisle Cars Passed.—Both houses of the Legislature of Ohio have passed the bill which provides that all cars on electric railways in Ohio shall be provided with a center aisle. The measure is now before the Governor.

Bill for Seats for Motormen Before Governor.—The Smith bill, requiring electric railways to provide seats for motormen and conductors, has passed both houses of the Ohio Legislature and is before Governor James W. Cox for his consideration.

Divided on State Constabulary.—The State Board of Conservation and Development of New Jersey divided on March 7 on the question of support for the bill creating a State constabulary. Four members favored the proposition, two were against it.

Employees Organize Social Fraternity.—The employees of the Public Service Railway at Trenton, N. J., have organized the Public Service Fraternity of the Trenton District, to promote good fellowship and bring the employees of the various branches of the service into personal touch.

Indiana Line Increases Wages.—The trainmen in the employ of the Bluffton & Marion Traction Company, Bluffton, Ind., received, effective on March 1, an increase in wages, the minimum being 20 cents an hour and the maximum 28 cents an hour. The maximum is paid after seven years of service.

General Goethals in Cleveland.—After making an address before the City Club in Cleveland, Ohio, on March 7, Maj.-Gen. George W. Goethals went over the route of the proposed freight subway under East Fifty-fifth Street with President O. C. Barber of the Cleveland, Akron & Canton Terminal Railway, which is to build the subway.

China and Japan Described to Massachusetts Association.—At the regular monthly meeting of the Massachusetts Street Railway Association, which was held on March 14 at the Engineers' Club, Boston, Charles B. Davis, district manager of the General Electric Company, described a recent trip made by him to China and Japan.

St. Louis Matters Still Under Consideration.—The matter of an answer to the proposal of the United Railways, St. Louis, Mo., to the city with respect to the mill tax and other matters is still under consideration by the public utilities committee of the Board of Aldermen. While it is not certain exactly what will be done, still the opinion prevails that definite action will not be taken until after the election, early in April.

Court Sustains Extension Order.—The Supreme Court in Brooklyn has entered an order directing the New York & Queens County Railway, Long Island City, N. Y., to begin construction of the extension of its line in Flushing Avenue, Queens, by April 1, 1918, to be completed not later than Aug. 31 of the same year. The commission directed the construction of the extension in 1914 and an appeal to the courts was immediately taken by the company.

Use of Gas-Electric Cars Proposed.—The Visalia Electric Railroad, Exeter, Cal., is said to be contemplating the use of a gas-electric car on several miles of line now under construction. W. P. Ballard, superintendent and electrical engineer for the company, who has returned from witnessing the trial of a gas-electric car on the San Diego & South Eastern Railroad, has reported favorably upon its operation, but proposes a car of a slightly different design as better suited to the needs of his own company.

Progress of New York Constabulary Measure.—The State constabulary bill was introduced in the Assembly of New York by F. H. Wells and in the Senate by Ogden L. Mills. The Wells, or companion of the Mills bill, rests in the ways and means committee of the Assembly. The Mills bill is on order of third reading in the Senate and comes up for final passage on March 20. When this bill passes it will go into the Assembly, where it will be substituted for the Wells bill. It must, however, be referred to the ways and means committee first, and then reported out.

Workmen's Compensation Agitation Increases Accident Claims.—Fielder Sanders, street railway commissioner of Cleveland, Ohio, stated recently that the agitation for workmen's compensation was responsible in part for the outlandish accident claims being made on the Cleveland Railway. These he declared to be a grave menace to low fare. Within the last four years the average demand has increased from $1,800 to $9,800. People have heard so much about compensation that they feel they are entitled to a huge sum when injured by a corporation, irrespective of the merits of the case.

Ohio Control Bill Modified.—The Gilmore bill, intended to bring all public and private utility plants, including those municipally owned, under the supervision of the Public Utilities Commission, has been amended in the Senate by eliminating the provision as far as municipally owned utilities and mutual telephone companies are concerned. This practically defeats the purpose of the bill. Senator Cunningham has introduced a bill increasing the number of members of the Public Utilities Commission from three to five and increasing the assessment on public utility companies from $75,000 to $100,000 to provide for the additional expense.

Company Opposes Further Compulsory Expenditures.—The Beaumont (Tex.) Traction Company lost $6,636 in operating and maintaining its street railway in Beaumont during the fiscal year ended Nov. 30, 1916, according to a report filed with the City Council at the hearing on the proposal to compel the company to make certain improvements and extensions of service. The report showed receipts from all sources of $201,914 and total disbursements of $208,511. The expenditures include the cost of several miles of new track built during the year and a number of new cars purchased. The company paid a gross income tax of $1,914.

Governor Signs Jersey Franchise Tax Bill.—Governor Edge of New Jersey has signed the bill increasing the franchise taxes of public utility corporations other than electric railways 1 per cent a year for the next three years. The franchise tax bill was passed in fulfillment of a pledge in the Republican State platform, which favored an increase in the taxes of public utility corporations to correspond with those assessed against the electric railways under the Voorhees franchise tax act of 1898. As a compromise it was decided to raise the tax on gross receipts at the rate of 1 per cent a year instead of levying the entire 5 per cent at the outset. The bill exempts from its provisions all companies whose gross income does not exceed $50,000 a year.

Rental Question Considered in Toledo.—A resolution was introduced in the City Council of Toledo, Ohio, recently, authorizing the director of law to take the necessary legal steps to compel the Toledo Railways & Light Company to pay a rental of $250 a day for the use of the streets, as required by an ordinance passed some months ago. Another ordinance pending before Council would require the payment of $185 a day as rental. The two measures will be considered together. During a hearing on the latter ordinance F. R. Coates, president of the company, told the members of the street railway committee that it might be necessary to increase the rate of fare in order to take care of present burdens without adding any others.

Fund for Relief of British Professional Classes.—Seventy-six prominent engineers, representing all sections of the country as well as the principal engineering societies in this country, have just issued a circular urging all American engineers to contribute to the Professional Classes War Relief Council in Great Britain. This council was organized to assist the families of professional men who are in distress on account of the war. Major Leonard Darwin, a son of the great naturalist, is chairman of the council. The circular expresses the hope that every American engineer will contribute at least $5 to this cause. These contributions may be forwarded to Lewis P. Stillwell, treasurer, care Farmers' Loan & Trust Company, 475 Fifth Avenue, New York.

Reduction in Railway Mail Pay.—The Post Office Department has applied to the Interstate Commerce Commission for a revision of the railway mail pay according to the plan adopted by Congress upon the department's recommendation less than a year ago. The department was so well satisfied with its plan of paying the railways according to space used, instead of by weight carried, that it put the plan into effect on 90 per cent of the mail-carrying railways, although Congress had contemplated its application upon selected routes for the purposes of trial. The result is that the railways earn at the rate of $3,222,405 more per year than on the weight basis. Now the department applies to the commission for a reduction of the rates, although still retaining the space system.

Minneapolis Street Railway Pays $10,421 for Hauling Snow.—Following its plan of stating its cases to the public by newspaper advertising, the Minneapolis (Minn.) Street Railway has replied to criticisms of property holders that it is impossible to keep sidewalks clear after a snow because street railway plows fill them again. In a three-column 6-in. display advertisement it makes a concise reply that the first duty of the company is to clear its tracks, establish and maintain service. Individual inconvenience because snow is piled temporarily on sides of streets until the city can cart it off is more than offset by convenience to the general public. The advertisement continues: "This company pays to the city 19/40 of the cost to the city of removing snow and ice from the streets, 40 ft. in width from curb to curb, and in like manner for hauling away the snow on a strip of 19 ft. wide in all streets, regardless of their width. Our double tracks occupy a space of 15 ft. only, but we are paying the city for removing from a strip 19 ft. wide. We not only pay the city for removing snow and ice for the full portion of the streets which our cars occupy, but in addition we pay an equal portion of the cost of hauling away snow and ice which property owners shovel off their sidewalks and throw into the street. During the winter of 1915-1916 the company paid the city $10,421 for hauling away snow and ice from the city streets."

Programs of Association Meetings

Railway Storekeepers' Association

The Railway Storekeepers' Association will hold its fourteenth annual convention at Chicago, Ill., on May 21, 22 and 23. Committee reports will be presented on the handling of rail, the handling of cross-ties, the reclamation of scrap and on other subjects of interest to storekeepers. The proper handling of materials distributed along the lines will also receive attention. The handling of stationery will be the subject of an exhaustive report. In addition, a number of interesting and novel features have been planned for this convention.

Illinois Electric Railway Association

The Illinois Electric Railway Association will meet at the Hotel La Salle, Chicago, Ill., on March 23. F. A. Lorenz, manager of sales of the American Steel Foundries, which manufacture the Davis steel wheel, will read a paper, "The One-Wear Manganese Rim Wheel." W. F. Carr, engineer of maintenance of way and overhead structures of the Chicago, Ottawa & Peoria Railway, will read a paper, "Track Construction and Maintenance." C. W. Regester, of the Westinghouse Electric & Manufacturing Company, will show a series of moving pictures depicting steam railroad electrification work.

Wisconsin Electrical Association

The annual meeting of the Wisconsin Electrical Association was held at the Hotel Pfister, Milwaukee, Wis., on March 14 and 15. Among the papers of interest to electric railway operatives scheduled for presentation were the following:

"Effect of High Prices of Material and Decreased Rates Upon the Rate of Return," by Halford Erickson, former chairman of the Railroad Commission of Wisconsin.

"Review of the Proposed National Electric Safety Code," by J. N. Cadby, of the engineering staff of the Railroad Commission of Wisconsin.

"One-Man Car Operation," by Raymond D. Smith, general manager of the Sheboygan Electric Company.

Financial and Corporate

Annual Reports

New York State Railways

The comparative statement of income, profit and loss of the New York State Railways, Rochester, N. Y., for the years ended Dec. 31, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Operating revenues	$8,256,470	100.0	$7,264,674	100.0
Operating expenses (including depreciation)	5,153,199	62.4	4,487,270	61.8
Net revenue from railway operation	$3,103,271	37.6	$2,777,404	38.2
Taxes	509,962	6.2	456,577	6.3
Operating income	$2,593,309	31.4	$2,320,827	31.9
Non-operating income	146,214	1.8	166,903	2.3
Gross income	$2,739,523	33.2	$2,487,730	34.2
Income deductions (interest, rentals, etc.)	1,377,775	16.7	1,389,119	19.1
Net income	$1,361,748	16.5	$1,098,611	15.1
New York State Railways' proportion of Schenectady Railway surplus (50 per cent)	17,035	0.2	•15,162	•0.2
New York State Railways' proportion of Ontario Light & Traction Company surplus (100 per cent)	8,089	0.1	7,090	0.1
	$1,386,872	16.8	$1,090,539	15.0
Dividends on preferred stock (5 per cent)	193,125	2.3	193,125	2.6
	$1,193,747	14.5	$897,414	12.4
Dividends on common stock (1916, 4¾ per cent; 1915, 4 per cent)	947,482	11.5	797,880	11.0
Balance	$246,265	3.0	$99,534	1.4

•Deficit.

The 1915 report of this company showed that the gross and net operating revenues had been materially affected by jitney competition and by the general business depression, the gross falling off $330,327, or 4.3 per cent, and the net $217,025, or 7.2 per cent, in 1915, as compared to 1914. The present report, however, indicates that the 1915 losses were more than recouped in the last year. The operating revenues, owing to the abolition of unregulated jitney competition and the improvement in business conditions, gained $991,796, or 13.6 per cent, in 1916, as compared to 1915. The operating expenses, including depreciation, at the same time rose $665,929, or 14.8 per cent, but the gain in net operating revenues was still $325,867, or 11.7 per cent. Taxes increased $53,385, or 11.6 per cent; non-operating income fell off $20,689, or 12.3 per cent, and income deductions decreased $11,344, or 0.9 per cent. The net effect of these items was to cut the gain in net income to $263,137 in amount, although the percentage increase showed the high rate of 23.9 per cent.

The 50 per cent portion of the Schenectady Railway surplus accruing to the company was in the last year a credit of $17,034, instead of a deficit of $15,162 as in 1915, and the 100 per cent of the Ontario Light & Traction Company surplus similarly accruing represented an increase of 14 per cent. As a result, after paying the usual 5 per cent preferred dividend and increasing the common stock dividend from 4 per cent in 1915 to 4¾ per cent in 1916, the company had remaining a balance of $246,264 for 1916. This constituted almost a 150 per cent advance over the balance of $99,534 for the year before.

The asset side of the balance sheet of the company as of Dec. 31, 1916, showed materials and supplies of $305,293, current assets of $363,772, investments of $2,456,307, unamortized replacement and depreciation expense of $4,850,000, and unamortized debt discount and expense of $1,612,705. The liability side included $2,149,605 for unfunded debt, $91,737 for casualties, $1,112,633 for accrued amortization of capital, $101,410 for reserves, $5,000,000 for a reserve for accrued replacements and depreciation, and $1,754,529 for the corporate surplus.

The origin of the previously mentioned surpluses of the subsidiary Schenectady Railway and the Ontario Light & Traction Company is shown in the following table:

	Schenectady Ry.		Ontario Lt. & Tr. Co.	
	1916	1915	1916	1915
Operating revenues	$1,329,583	$1,178,215	$64,890	$59,825
Operating expenses	867,153	762,211	40,457	37,429
Net revenue from railway operations	$462,430	$416,004	$24,433	$22,396
Taxes	88,811	91,313	*4,084	*3,833
Operating income	$373,618	$324,691	$20,349	$18,563
Non-operating income	2,678	†52	6,619	6,624
Gross income	$376,297	$324,638	$26,968	$25,187
Income deductions	137,227	108,964	18,879	18,096
Net income	$239,070	$215,675	$8,089	$7,091
Dividends (1916, 5 per cent; 1915, 6 per cent)	205,000	246,000	......	......
Surplus	$34,070	†$30,325	$8,089	$7,091

*Includes $155 in 1916 and $264 in 1915 for uncollectible bills.
†Deficit.

Christchurch Tramway

The gross earnings of the Christchurch (New Zealand) Tramway for the year ended March 31, 1916, amounted to £144,847, while the operating expenses totaled £83,315, leaving a net from operation of £61,532. After a deduction of £58,788 for various reserves and other charges, and £1,445 for wages paid to men at the front and other patriotic expenses during the year, the surplus was £1,298.

According to the tramway board, when everything is taken into consideration, the result of the operation for the year must be regarded as highly satisfactory. In the first place, the cost of operating the cars rose considerably, to the extent of £5,242, owing to the increasing age of the system, higher prices of materials and increased wages. The main increase was £3,390 for repairs and maintenance. While the operating expenses increased 6.7 per cent during the year, the earnings did not keep pace, the increase being only £1,906, or 1.3 per cent.

The total number of passengers carried during the year was 17,831,644, an increase of more than 1,000,000 passengers. The average revenue per passenger was 1.949d., as compared to 2.038d. the year previous. The working expenses per passenger amounted to 1.121d., while the total average cost per passenger, including interest, sinking fund, depreciation, etc., was 1.932d. The average revenue per car-mile was 15.072d., and working expenses 8.669d.

West Jersey & Seashore Railroad

The West Jersey & Seashore Railroad in the calendar year 1916 carried more passengers and freight than in any previous year. During the year 11,983,739 passengers and 3,958,845 tons of freight were carried; 1,816,369 more people rode than in 1915, and 413,904 more tons of freight were hauled. The company earned, for the year, a net income of $940,315, an increase of $365,531.

The point most of interest to electric railways in connection with this report is that the non-operating income decreased 12 per cent, principally on account of a further decrease in the rents from the Atlantic Avenue & Longport Line operated for the railroad by the Atlantic City & Shore Railroad. The decrease was caused by the continued operation of large number of jitneys in Atlantic City. In 1916 the city authorities made an attempt reasonably to regulate the jitney traffic, but legal proceedings have prevented so far the more equitable results expected from such action.

Indiana Interurban Statistics

Special Figures Compiled by Commission in Regard to Capitalization and Rate of Return

The second annual report of the Indiana Public Service Commission, for the fiscal year ended Sept. 30, 1915, which has just been received, contains a series of statistical tables for the various electric interurban railways operating in the State. Besides the usual revenue and expense figures for the fiscal year ended June 30, 1915, the report contains a table for each company showing the outstanding bonds, the current liabilities and the outstanding stock per mile of single track, the gross income for 1915 after the payment of operating expenses and taxes, the amount that this would yield on the bonds alone and on the total capitalization, and also the capitalization of the gross income per mile at 5 per cent. From the data for each company the accompanying table has been prepared.

According to the data in the table, the 1915 return of the various lines on capitalization varied from nothing in the case of one company which operated at a deficit to 5.77 per cent in the case of the Ohio Electric Railway. Other companies whose rate of return was 5 per cent or more were the Indiana Railways & Light Company, with 5.56 per cent, and the Public Utilities Company, with 5.06 per cent. According to the commission's report, the properties in the State were greatly affected during the year by the operation of jitney buses and general automobile competition. The properties, therefore, could not well be regarded as in a condition satisfactory to the investors.

STATISTICS ON CAPITALIZATION AND RATE OF RETURN OF INDIANA INTERURBAN RAILWAYS

Name	Mileage Single Track	Capitalization* Per Mile	Gross Income** Per Mile Capitalized at 5 Per Cent	Percentage of Gross Income to Bonds	Percentage of Gross Income to Capitalization
Bluffton, Geneva & Celina Traction Company	†18.5	$36,863	$7,581	(a)	1.03
Chicago, Lake Shore & South Bend Railway	†77.8	134,451	11,165	0.98	0.41
Chicago, South Bend & Northern Indiana Railway	120.4	99,317	47,535	6.76	2.39
Cincinnati, Lawrenceburg & Aurora Electric Street Railroad	....	82,767	33,702	5.43	2.03
Evansville Railways	†68.3	46,568	25,602	6.34	2.75
Evansville, Suburban & Newburgh Railway	24.7	32,221	28,251	7.15	4.38
Fort Wayne & Northern Indiana Traction Company	192.5	103,463	70,408	5.16	3.40
Fort Wayne & Northwestern Railway	42.9	39,289	30,350	‡17.38	‡3.86
Fort Wayne & Springfield Railway	21.7	32,198	4,950	19.19	0.77
Gary & Interurban Railroad	74.8	97,186	(b)	(b)	(b)
Hammond, Whiting & East Chicago Railway	19.9	118,874	93,975	9.36	3.95
Indianapolis & Cincinnati Traction Company	104.4	59,083	29,068	6.32	2.46
Indianapolis & Louisville Traction Company	40.9	49,820	22,875	5.51	2.30
Interstate Public Service Company	58.5	163,236	147,629	12.24	4.52
Indiana Railways & Light Company	59.5	71,262	79,205	13.07	5.56
Lebanon & Thornton Traction Company	9.3	32,416	14,179	4.41	2.19
Louisville & Northern Railway & Lighting Company	19.4	§276,131	32,071	3.64	0.58
Louisville & Southern Indiana Traction Company	22.7	179,728	77,555	7.04	2.16
Marion & Bluffton Traction Company	31.8	23,051	18,856	5.96	4.09
Muncie & Portland Traction Company	31.7	31,698	16,853	(c)	2.66
Ohio Electric Railway	600.7	42,256	48,752	17.68	5.77
Public Utilities Company	54.1	172,724	174,752	13.12	5.06
Southern Michigan Railway	32.9	98,168	51,684	7.61	2.63
Terre Haute, Indianapolis & Eastern Traction Company	428.9	84,080	61,449	8.48	3.65
Union Traction Company	403.2	65,594	44,270	5.78	3.37
Winona Interurban Railway	72.4	19,813	14,898	5.39	3.76
Indiana Utilities Company	3.7	29,600	14,043	6.57	2.37
Gary & Southern Traction Company	14.5	38,950	6,959	2.02	0.89

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*Includes outstanding bonds, current liabilities and outstanding stock.
**After operating expenses and taxes.
†Mileage first main track.
‡Taxes not reported.
§Investments in securities of affiliated non-carrier companies and collateral deposits, $2,465,900.
(a) No bonds; per cent on stock, 1.039.
(b) Deficit.
(c) No bonds outstanding.

1916 Results of London Pool

The reports of the five operating railways working under the pooling scheme proposed by the holding company, the Underground Electric Railways, Ltd., London, England, have been issued for the calendar year 1916. The companies that are parties to the common fund agreement dated Dec. 21, 1915, are the City & South London Railway, the Central London Railway, the London Electric Railway, the Metropolitan District Railway and the London General Omnibus Company, Ltd. The aggregate traffic receipts of these companies for 1916 were £5,278,812, as compared to £4,924,245 for the preceding year. The aggregate gross receipts of the five companies from all sources were £6,038,529 in 1916, as compared to £5,481,144 in 1915.

The aggregate amount retained by the five companies in 1916 for "revenue liabilities" as defined in the agreement, which include working expenses, prior charges, reserves and other items specified, was £5,531,561. The balance of £506,967, which compares with £451,365 in 1915, was credited to the common fund authorized under the act, and this was divided among the companies as follows:

Metropolitan District Railway	£ 60,836	12 per cent
City & South London Railway............	30,418	6 per cent
London Electric Railway	152,090	30 per cent
Central London Railway..................	101,393	20 per cent
London General Omnibus Company, Ltd...	162,230	32 per cent

The total number of passengers carried by the five companies and the average fare per passenger were not given in the reports, owing to the fact that the Metropolitan District Railway is still under government control and the figures of that company are consequently not available.

California Railway & Power Company, San Francisco, Cal.—A special meeting of stockholders is scheduled to be held in New York City on March 29 for the purpose of taking action in regard to the proposed reorganization plan of the United Railroads of San Francisco, which involves among other things the disposition by the California Railway & Power Company of the United Railroads securities held by it, including stock of the San Francisco Electric Railways, and the receipt of securities in such reorganization. The meeting will also consider any other matters having to do with the proposed reorganization.

Cleburne (Tex.) Traction Company.—The property of the Cleburne Traction Company was sold at public sale to the highest bidder on March 6. John W. Floore, Sr., Cleburne bought the property in for $12,500. Mr. Floore announced that he would not operate the line, but would hold it for sale to any company that promised to operate it. There is a movement on foot for the organization of a local company to purchase and operate the line.

Clinton (Iowa) Street Railway.—Coffin & Burr, Boston, Mass., are offering at 98½ and interest $350,000, part of $400,000 of first mortgage 5 per cent gold bonds of the Clinton Street Railway. The bonds are dated 1906 and are due March 31, 1926, but are callable at 105. Interest is payable at the office of the Illinois Trust & Savings Bank, Chicago, Ill.

Electric Bond & Share Company, New York, N. Y.—The Electric Bond & Share Company reported for the calendar year 1916 gross income of $2,170,915, an increase of $350,578 over 1915. The net income at $1,566,932 showed a gain of $165,847 for the year. After the payment of $375,558 in preferred dividends, an increase of $30,911, and $458,222 in common dividends, an increase of $24,444, the surplus for the year totaled $733,152, a gain of $110,493. After adjustments and the payment of a special common dividend of $1,000,000 in 1916, the surplus on Jan. 1, 1917, amounted to $5,173,700.

Evansville (Ind.) Railways.—Plans are being developed for the reorganization of the Evansville (Ind.) Railways. This company was unable to pay the interest on the first mortgage bonds of the Evansville Terminal Railway due on Jan. 1, 1917, and has announced that it will be unable to pay the interest on either the first mortgage bonds of the Evansville & Eastern Railway or the Evansville & Mount Vernon Electric Railway on April 1. In consequence, a committee, of which James T. Walker, director of the People's Savings Bank, Evansville, is chairman, is asking for deposits of the bonds. A number of circumstances contributed to the financial difficulties of the company. Crops have been short for several years, the prices of materials and supplies have been almost prohibitive and on Nov. 14, 1916, a collision occurred out of which large liabilities are likely to develop. The Evansville Railways and the controlled companies give through service from Mount Vernon, Ind., to Grandview, Ind., and it is the opinion of the committee that has been organized to represent the bondholders that their interests will be best served by continuing the properties as a unit.

Gary & Southern Traction Company, Gary, Ind.—The Indiana Public Service Commission has authorized the Gary & Southern Traction Company to issue $200,000 of its first mortgage ten year gold bonds, dated Oct. 1, 1916, due and payable on Oct. 1, 1926, and to sell, at par, $150,000 of the bonds for the purpose of retiring and canceling a former issue of $300,000, of which issue $250,000, bearing interest at the rate of 5 per cent, have been sold and are now outstanding. The remaining $50,000 of the issue is now held in the treasury. Should the $150,000 be unsufficient to take up the former outstanding issue of $250,000, the remainder will be paid in cash by the company, and the $50,000 now held in the treasury will be cancelled and destroyed. Of the $200,000 just authorized $50,000 will be kept in the treasury to make additions, betterments, extensions and improvements.

Jacksonville (Fla.) Traction Company.—Stone & Webster, Boston, Mass., are offering at 98 and interest $750,000 of two-year 6 per cent gold coupon notes of the Jacksonville Traction Company dated March 1, 1917. The authorized issue is $1,000,000. The proceeds of the notes have been used to retire the present $750,000 of 6 per cent coupon notes due March 1, 1917.

New Brunswick Power Company, St. John, N. B.—The New Brunswick Power Company has sold to Bodell & Company, Providence, R. I., $1,000,000 of 7 per cent first preferred stock, out of an authorized issue of $3,500,000. There is outstanding now $350,000 of second preferred stock, $2,000,000 of common stock, and $1,750,000 of first mortgage 5 per cent bonds. The company was recently chartered by the Province of New Brunswick to take over the St. John's Railway, which operates the electric light and power, gas and electric railway service in St. John. The deal for the purchase of the stock of the St. John Railway was referred to in the ELECTRIC RAILWAY JOURNAL of March 3, page 410, and Feb. 10, page 268. Harris, Forbes & Company, New York, N. Y., are offering for subscription $1,750,000 of first mortgage 5 per cent gold bonds of the New Brunswick Power Company dated March 1, 1917, and due March 1, 1937.

Seattle, Renton & Southern Railway, Seattle, Wash.—The petition of James W. Wall to have a receiver appointed for the Seattle, Renton & Southern Railway was dismissed by Federal Judge Edward E. Cushman on March 8. The petitioner sought to have set aside bonds of the railway used in the purchase of the Seattle & Rainier Valley Railway. The decision disposes of all pending litigation and clears the way for making of extensive repairs, extensions and changes of the company's property. Judge Cushman declared that there was no merit in the contention of the petitioner that the giving of an upset price of more than $1,000,000 upon property estimated to be worth only $846,000 and allowing the use of the bonds by the committee which bid in the plant, constituted a fraud upon the intending bidders.

Standard Gas & Electric Company, Chicago, Ill.—The Standard Gas & Electric Company is asking through the Philadelphia Trust Company for tenders until April 12 of sufficient of its convertible 6 per cent sinking fund gold bonds, dated Dec. 1, 1911, and maturing Dec. 1, 1926, to exhaust $1,025,500 now available for sinking fund of this issue.

Texas Electric Railway, Dallas, Tex.—The Texas Traction Company, recently consolidated with the Southern Traction Company as the Texas Electric Railway, has called all of its outstanding three-year 7 per cent gold notes due in 1919 at par and interest, payable on April 1 at the office of the Guaranty Trust Company, New York, N. Y. The amount outstanding was $700,000.

Dividends Declared

Arkansas Valley Railway, Light & Power Company, Pueblo, Col., quarterly, 1¾ per cent, preferred.

Connecticut Valley Street Railway, Greenfield, Mass., 3 per cent, preferred.

Galveston-Houston Electric Company, Galveston, Tex., quarterly, 3 per cent, preferred.

Manila Electric Railroad & Lighting Corporation, Manila, P. I., quarterly, 1½ per cent.

Philadelphia Company, Pittsburgh, Pa., $1.50, on 6 per cent preferred.

Philadelphia (Pa.) Traction Company, $2.

Toronto (Ont.) Railway, quarterly, 2 per cent.

Tri-City Railway & Light Company, Davenport, Iowa, quarterly, 1½ per cent, preferred; quarterly, 1 per cent, common.

Twin City Rapid Transit Company, Minneapolis, Minn., quarterly, 1¾ per cent, preferred; quarterly, 1½ per cent, common.

United Traction & Electric Company, Providence, R. I., quarterly, 1¼ per cent.

West End Street Railway, Boston, Mass., $1.75, common.

West Penn Power Company, Pittsburgh, Pa., quarterly, 1¾ per cent, preferred.

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan.,	'17	$74,684	*$42,912	$31,772	$18,725	$13,047
1 " "	'16	66,284	*34,648	31,636	17,717	13,919
12 " "	'17	838,388	*469,141	369,247	215,924	153,323
12 " "	'16	789,786	*404,316	385,470	212,697	172,773

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

1m., Jan.,	'17	$337,571	*$228,524	$109,047	$44,269	$64,778
1 " "	'16	297,417	*172,919	124,498	41,122	83,376
12 " "	'17	3,577,554	*2,160,729	1,416.825	519,521	897.304
12 " "	'16	3,135,840	*1,855,178	1,280,662	478,684	801,978

COMMONWEALTH POWER, RAILWAY & LIGHT CAMPANY, GRAND RAPIDS, MICH.

1m., Jan.,	'17	$1,617,719	*$931,056	$686,663	$430,359	$256,304
1 " "	'16	1,407,552	*726,500	681,052	411,368	269,684
12 " "	'17	17,172,773	*9,480,594	7,692,179	5,053.816	2,638,363
12 " "	'16	14,755,303	*7,863,512	6,891,791	4,557,075	2,334,716

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.

1m., Jan.,	'17	$238,719	*$164,353	$74,366	$66,167	$8,199
1 " "	'16	213,184	*133,393	79,791	65,851	13,940
12 " "	'17	2,892,531	*1,806,446	1,806,085	809,658	276,427
12 " "	'16	2,655,336	*1,519,039	1,136,297	795,697	340,600

EAST ST. LOUIS & SUBURBAN RAILWAY, EAST ST. LOUIS, ILL.

1m., Jan.,	'17	$292,607	*$194,800	$97,807	$64,065	$33,742
1 " "	'16	229,368	*137,982	91,386	61,853	29,533
12 " "	'17	3,090,938	*1,877,592	1,213,346	757,245	456,101
12 " "	'16	2,490,176	*1,487,895	1,002,281	754,883	247,398

GRAND RAPIDS (MICH.) RAILWAY

1m., Jan.,	'17	$113,108	*$74,464	$38,644	$18,051	$20,593
1 " "	'16	105,817	*64,663	41,154	14,534	26,620
12 " "	'17	1,304,878	*837,827	467,051	190,436	276,615
12 " "	'16	1,177,539	*830,449	347,090	165,980	181,110

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.

1m., Jan.,	'17	$61,703	*$54,188	$7,515	$15,308	†$7,793
1 " "	'16	52,883	*40,350	12,533	15,963	†3,430
12 " "	'17	812,480	*567,134	245,346	187,118	58,228
12 " "	'16	741,207	*477,165	264,042	190,224	73,818

HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.

1m., Jan.,	'17	$541,294	*$234,332	$306,962	$216,231	$90,731
1 " "	'16	495,559	*211,286	284.273	213,397	70,876

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

1m., Jan.,	'17	$209,869	*$133,275	$76,594	$41,238	$35,356
1 " "	'16	196,585	*116,354	80,231	43,083	37,148
12 " "	'17	2,396,326	*1,470,109	926,217	507,127	419,090
12 " "	'16	2,155,941	*1,328,210	827,731	511,653	316,078

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

1m., Jan.,	'17	$490,231	*$260,189	$230,042	$182,338	$47,704
1 " "	'16	454,988	*257,732	197,256	181,762	15,494
12 " "	'17	5,518,352	*3,040,711	2,477,641	2,178,833	298,808
12 " "	'16	5,476,620	*3,069,956	2,406,664	2,207,756	198,908

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*Includes taxes. †Deficit.

Traffic and Transportation

Dealing with Traffic Obstructors

Kansas City, Buffalo and Detroit All Confronted with the Problem—Buffalo Railway Employees Receive Police Power

Kansas City, Mo., has recently adopted a new set of traffic rules, and the ordinance is being strictly enforced. A condensed statement of the ordinance, in pamphlet form, is distributed on the cars of the Kansas City Railways for the information of the public. The feature of the measure that materially expedites street car traffic provides that motor cars must not be parked on east-and-west downtown streets, but may be ranked parallel with the curb and 4 ft. apart on north-and-south streets. On most streets there is now room for motor car traffic between the ranked cars and the street car tracks, and a very appreciable improvement has resulted in street car operation during rush hours. Previously, automobiles were parked at an angle, and, on most streets, other motor cars had to use the street car tracks.

PUBLIC SENTIMENT INFLUENCED

That the present safety campaign of the Kansas City Railways has influenced public sentiment materially was indicated in a recent trial of two men who obstructed traffic by driving on the street car tracks. Each of the men was fined $10 on the ground that he had interfered with the public that was riding on the cars. The company is using the incident to arouse public sentiment against the "track hog," and published in all the newspapers a notice about the case. On the whole, however, the railway is receiving support from team and truck owners in its efforts to reduce collisions and traffic delays.

At the request of E. G. Connette, president of the International Railway, Buffalo, N. Y., thirty-five district superintendents and uniformed supervisors have been sworn in as special police officers by John Martin, chief of police. The special officers will have authority to make arrests of vehicle drivers who violate traffic ordinances by ignoring requests of motormen to turn off the tracks and allow cars to pass. Because of the refusal of some drivers to obey this ordinance, many street car delays have been caused. N. H. Brown, general superintendent of the International Railway, believes that the arrest of obstinate drivers will greatly aid in the enforcement of these traffic regulations.

Complaints about the "track hog" also come from Detroit. In a recent instance on the Detroit (Mich.) United Railway, noted by that company in its publication distributed to the public, a coal-wagon driver persisted in driving on the tracks for nine blocks during the rush-hour period.

Increase in Fare Denied

Despite the ruling of the United States Supreme Court in the Detroit fare case that the annexation of suburban districts by a municipality does not extend the city fare to those districts, the Court of Appeals of New York has handed down a decision denying an increase in fare to the New York State Railways between the Rochester city line and Charlotte territory. In view of the ruling of the United States Supreme Court a further appeal will be taken by the Rochester lines. Several years ago the New York State Railways began charging an extra 5-cent fare between the Rochester city line and Charlotte territory. Charlotte is the lake-port of Rochester and because of the number of amusement places, etc., at the port, there is heavy travel between the two points. An injunction was obtained by the company in the Supreme Court of Monroe County against a reduction in fare as ordered by the municipality and pending the appeal to the courts the general passenger agent of the company has been issuing claim coupons for 5 cents to passengers from whom the additional fare had been collected.

Hearing on F., J. & G. Fares

Rising Cost of Labor and Supplies Advanced as Reasons for Fare Increases

The only opposition to the proposed increases of fares on the Fonda, Johnstown & Gloversville Railroad between Schenectady, Gloversville, Fonda and intermediate points, when the company presented its case before the Public Service Commission for the Second District at Albany on March 8 came from Charles H. Collins, Colonie, and Frank H. Deal, representing the Schenectady council of the United Commercial Travelers. Mr. Deal qualified his appearance, however, by saying before the evidence was heard that he objected not to the new rates but to the manner in which the company had sought to put them into effect. The proposed changes in fare were referred to in the ELECTRIC RAILWAY JOURNAL for Feb. 10, page 271.

The case of the railroad was presented by William B. Baker and Frank Burton of Baker, Burton & Baker. They introduced William H. Collins, general manager of the road, as a witness to show that the increase in rates was justified by the rising cost of labor and supplies and the failure of the gross revenue to increase in proportion to the general improvement of business. Upon the objection of Mr. Deal Mr. Collins was not permitted to give his conclusions as to whether the revenue of the company under the present rates was sufficient and he declined to give testimony as to the details of the company's financial status, declaring that to be the province of the president of the company. Figures from the company's annual reports to the commission were submitted to sustain the contentions concerning increased expenses and inadequate increases of revenue.

The hearing was adjourned with the understanding that the company would file further statistics along these lines. The commission reserved the right to Mr. Deal to ask for a continuation of the hearing at some future date when he may, if he desires, cross-examine the company's representatives.

Segregation of Passengers Impracticable

In the decision issued on Feb. 20, in the case of the borough of Shenandoah against the Schuylkill Railway, Girardsville, Pa., the Public Service Commission of Pennsylvania requires the railway to make certain improvements in its cars and schedules, but does not require it to provide equipment for the segregation of mining passengers. The commission examined the company's cars on Oct. 16, 1916, and found that, of the thirty-eight in operation during the year, four were new double-truck cars put in service last spring, and four others were recently repaired and put in good condition. About half of the cars were considered by the commission to be inadequate to the service with respect to some feature of their equipment. The company had also placed orders for six new cars.

It was apparent that many of the cars were too small for interurban use to afford comfort and safety to passengers, especially during the hours of heavy traffic. The commission did not regard it necessary to require the purchase and installation of new cars in view of the fact that recent steps taken by the company to renew the equipment promise that every reasonable requirement for the service will be met within a comparatively short time. According to the order that was issued, the company is required to change its schedules, repaint several cars, renew all defective equipment, and improve its heating facilities.

Investigations showed that it would be impracticable to provide for the segregation of miners by operating special cars or reserving a compartment in cars as suggested by the complainant, for occasion might arise when miners would find it advantageous to ride on the regular cars. The commission held that the railway was obliged to carry upon any of its cars any miner who had complied with its transportation rules and regulations, and that, although many of the miners preferred a special arrangement for their transportation, the commission knew of no method whereby that could be attained.

Jitney Legislation in California

The Railroad Commission of California has prepared and submitted to the legislature a bill providing for the legislation of jitneys throughout the entire State. The proposed measure provides that no corporation or person "shall operate any automobile, jitney bus, auto truck, stage or auto stage for the transportation of persons or property for compensation on any public highway in this State, unless a permit has first been secured."

The bill requires every jitney bus, whether or not it operates wholly within a municipality, to first obtain a permit from the political subdivision in which it wishes to operate. In addition to the permits, those jitney buses which wish to operate outside of any municipality are required to obtain a certificate of public convenience and necessity from the Railroad Commission.

The bill also provides for the regulation by the Railroad Commission of the issue of stocks, bonds and notes, the latter only when they aggregate more than $2,500, of jitney buses which do not operate solely within the limits of a municipality. It also vests in the Railroad Commission jurisdiction over rates and service of jitney buses when they do not operate wholly within the limits of a municipality. This is in accordance with the decision of the Supreme Court.

Comment on Fall River Fares

In commenting upon the recent decision of the Public Service Commission of Massachusetts, allowing the Bay State Street Railway, Boston, Mass., to discontinue the sale of six tickets for 25 cents to the passengers within the city limits of Fall River, the Boston *Herald* states editorially that satisfactory service could not be expected of any public service corporation that was denied the right to make reasonable profits, and likened the service of such a corporation to the work of an employee who was poorly fed and in ill health. The comment continues, in part, as follows:

"With operating expenses mounting day by day, with labor receiving more than ever before, with adverse legislation dampening the ardor of the investing public, the managers of the public service corporation of the present time carry a heavy load. But there is encouragement for them in the decisions that have of late been made in their favor, and in the awakening of the public at large to a recognition of the possibilities of driving away investors and thus making impossible the realization of public needs for better service. Fall River's apparent loss will benefit every public service corporation in the State in the minds of the investing public by creating new confidence in the fairness of the Public Service Commission."

Chicago Council Bars Parking

The City Council of Chicago, Ill., on March 12, passed two ordinances of great importance to surface lines transportation. One of these prohibits the parking of automobiles and other vehicles between the hours of 7 a. m. and 10 a. m. and 4 p. m. and 7 p. m. anywhere within the territory bounded by Lake Street, Wabash Avenue, Harrison Street and Market Street, comprising the Loop district. Vehicles will be permitted during these two rush periods to stop at the curb only long enough to discharge or take on passengers, or to load or unload baggage or merchandise.

The other ordinance passed created loading zones for the surface cars on eighteen of the corners in the Loop district where the parking of vehicles will be prohibited at all times. These loading zones will extend back from the corner a distance of 100 ft. and will be marked by signs.

Both ordinances are to become effective on May 1, and it is expected that these will greatly facilitate the movement of surface cars in the downtown district. This legislation is said to have come as the result of the inspection trip through the Eastern cities made by a number of Chicago Aldermen a few months ago, and also to recommendations of the Chicago Traction and Subway Commission and studies made by the Chicago *Herald* and the Chicago Surface Lines in pointing out the causes of street car delays.

Railway to Operate Buses.—The Southwestern Traction & Power Company operating along Bayou Teche between New Iberia and Jeanerette, La., has completed arrangements to operate auto buses between Edgar, a midway point on its line, and the new oil fields 3 miles east of New Iberia.

Plans for Norfolk Skip-Stop Nearly Completed.—The plans of the Virginia Railway & Power Company for the skip-stop system for Norfolk will soon be ready to be submitted to the City Council. If the system is approved, it will be put into effect without delay. The zones to which the system will apply are being worked out. The system will not be used in the business district.

Decrease in Fatal Accidents in Illinois.—The State Public Utilities Commission of Illinois reports that during the year 1916 there were five fatalities as compared with sixteen in 1915, in the number of passengers killed and injured on the electric railways of the state. The decrease is attributed to a more wholesome understanding on the part of the public of the value to them of the safety first campaigns conducted by the electric railways.

Unsatisfactory Service in Camden, N. J., Charged.—The Camden (N. J.) City Planning Commission, in its second annual report which will be presented to the City Council at its next meeting, alleges that the service of the Public Service Railway in Camden is unsatisfactory. It is also stated that the cars of different types run in Camden tend toward confusion and that there is need for more uniformity with respect to destination signs.

Auxiliary Bus Service in Fort Wayne.—The Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has contracted for four Studebaker buses of sixteen passenger capacity each to be delivered immediately. The buses will be painted the same color as the city cars of the railway and will be placed in service on Runnion Avenue and High Street to afford a belt line serving Bloomingdale. They will meet West Main Street cars at Main and Runnion Streets and Bloomingdale cars at Wells and High Streets.

Proficient Motorman Writes Essay on Coasting.—The San Francisco-Oakland Terminal Railways, Oakland, Cal., have published a folder containing an article entitled "Coasting and Its Principle." The article was written by O. W. Butler, a motorman of this company, who has an exceptionally good coasting record, and shows considerable interest in his work. It was decided to have the article printed in pamphlet form and place a copy of this pamphlet in the hands of each one of the conductors and motormen.

River Service to Supplement Electric Line.—The Crescent Navigation Company has purchased from Rounds Brothers, both river transportation companies of Owensboro, Ky., two fast motorboats, which will be put in service between Owensboro, Ky., and Rockport, Ind., making connections at Rockport with the limited trains of the Evansville & Eastern Electric Railway, running between Rockport and Evansville, Ind. Six trips will be made daily, and through rates are quoted from Owensboro to Evansville for passenger traffic. Rounds Brothers will withdraw from river service.

Railway Co-operates with Tobacco Growers.—Unusually good service on the Louisville & Interurban Railroad, Louisville, Ky., has been afforded the farmers in that district in transporting their tobacco crop. The farmers watch the Louisville market, and when it closes high one day they expect to get their tobacco on the "breaks" for the sales of the next day. It is not uncommon to have a shipment sold to Louisville buyers two hours after it is loaded on cars in Shelbyville. During the spring season, this road has handled nearly 300 carloads of tobacco in addition to other farm produce.

Annual Passes Granted to Employees.—The Union Traction Company of Indiana, Anderson, Ind., will, beginning April 1, grant annual card passes to its employees instead of a separate pass for each trip as at present. The annual passes will be divided into three classes. Employees in the service of the company for three years will receive a card pass good on the local division at all times, while those in service five years will receive a pass good over the entire system. A man employed seven years or longer will receive a card pass for himself and one for his wife, good over the entire system at all times.

Kansas City Railways Reward Presence of Mind.—The Kansas City (Mo.) Railways rewarded five platform men during January for particular alertness and watchfulness on duty. Twenty-five dollars went to a conductor who captured and held a negro who had tried to hold up the car, until the police came to take the bandit in charge; $10 to a motorman who threw a switch and prevented a collision; $5 to a motorman who backed his car and caught a following car that was sliding; $10 to a motorman who backed his car and caught two runaways; $5 to a conductor who took charge of a car of the company when the motorman lost control.

Hot Springs Line Encourages Church-Going.—In the health and pleasure resort of Hot Springs, Ark., with its 400 hotels and boarding houses, and where there are thousands of visitors from all parts of the world, the Hot Springs Railway has found a "Go to church" advertisement helpful in increasing street railway receipts, besides being highly appreciated by the churches of the city. A typical advertisement is worded as follows: "Go to church to-day—Visitors and Citizens Invited by all Pastors—see Columns of this Paper for Church Directory—All Churches are Located on or close to the Street Car Lines. Best Possible Car Service."

Forty-four Reported Killed by Vehicles in February.—A total of forty-four persons lost their lives in New York City during February, in accidents due to vehicles, according to statistics gathered by the National Highways Protective Society, and based upon reports from the coroner's office checked up from other sources. The society reported that automobiles caused the death of thirty, trolleys eleven, and wagons three, an increase of sixteen by automobiles and six by trolleys, as compared with February, 1916. In New York State, outside of this city, twenty-three persons were killed, as compared with fifteen for the corresponding month last year.

B. R. T. Efficiency Campaign Praised.—The joint efficiency campaign inaugurated by the men and management of the Brooklyn (N. Y.) Rapid Transit System, and the use of its standard courtesy code, are receiving commendation from various sources. Several other railways have requested copies of the efficiency bulletins, and two important systems, the Bay State Street Railway, Boston, Mass., and the Columbus Railway, Power & Light Company, Columbus, Ohio, have sent representatives to Brooklyn to investigate the efficiency program. This campaign by the Brooklyn company has been reviewed in previous issues of the ELECTRIC RAILWAY JOURNAL.

Posters Used in Anti-Spitting Campaign.—Posters, reminding passengers of the anti-spitting laws, are being displayed in the cars of the Beaver Valley Traction Company, New Brighton, Pa., in its present campaign for cleaner cars. The nature of the posters is that of a polite invitation to the public to help improve the condition of the cars, and at the same time they serve as a sufficient warning that health laws will be enforced. The wording is as follows: "We want you to feel at home on our cars. Therefore we trust that it will not be necessary to cause you any annoyance or embarrassment by the enforcement of the anti-spitting laws. We feel certain that you would not break them at home, and we want to make our cars as homelike as possible."

Improved Service for Salt Lake.—Plans for improving the service of the Utah Light & Traction Company, Salt Lake City, Utah, have been announced by H. F. Dicke, who was recently appointed general manager. All the cars owned by the company are being repainted and varnished, while the car equipment is being thoroughly overhauled. Orders have been placed for new car signs with numerals to designate the route over which the car travels. Vest-pocket booklets, to explain the numbering of the cars, and containing maps of the city, and time-tables, are being printed which will give the exact route and schedule time of each car. These will be placed in the cars for the use of patrons. The plans include also the purchase of additional snow-fighting equipment.

More "Journal" Cartoons Reproduced.—The editorial on "Complaints" which appeared in the February issue of the magazine published monthly by the Southern Public Utilities Company, Charlotte, N. C., has provoked a considerable amount of favorable comment. It was inspired in part by one of the editorial cartoons which were published in recent issues of the ELECTRIC RAILWAY JOURNAL. In this connection it is of interest to note that this particular cartoon, entitled "How Are Complaints Handled on Your Road?" is reproduced on the front cover of the March issue of this company's magazine. Another one of the cartoons of this series with the title "Every Employee a Publicity Representative" appears in the March issue of *Safety*, the bulletin of the Union Traction Company of Indiana, Anderson, Ind.

Kansas City Railways Publish New Time-Tables.—The Kansas City (Mo.) Railways, which established a department of schedules several months ago with D. J. Fennell in charge, has found the department a means of gaining large favor with the public, through the assistance of advertising. The schedules have been worked out to the point where they are fairly settled, and now they are being advertised. Recently time-tables showing arrivals and departures at each terminal of each line were published in the local newspapers. The published schedules give exact information as to when cars leave the ends of the lines, and the patron can easily calculate the time any car will reach his corner. The company will publish special time-tables for each line, to be posted in the cars. These tables will go somewhat more into detail as to schedules, with reference to important transfer points.

Hearing on Railway Sanitary Code.—Street railways operating in Buffalo, N. Y., are opposing the enactment of a new sanitary code which has been recommended to the City Council by the Commissioner of Public Health. The proposed ordinances provide for the regulation of sanitary and other conditions on the street cars operated within the city. The companies affected will be the International Railway, the Buffalo & Lake Erie Traction Company and the Buffalo Southern Railway. A public hearing on the proposed law was held on March 1 before the City Council, and the companies were permitted to voice their objections. Those who appeared for the corporations branded the code as unfair and impractical. Previous test votes taken by the five members of the Council indicate that they do not approve of the measure. On a previous occasion a similar law was disapproved by a vote of four to one.

Motorman's Wife Keeps House for $43 a Month.—The high cost of living has no terrors for Mrs. C. V. Barker, the wife of a motorman on the Kansas City (Mo.) Railways, who tells in the February issue of the *Kansas City Railwayan* how she and her husband live on $43 a month, without unduly stinting themselves, as shown by the reasonably generous menus reproduced in the company publication. According to an itemized list of household expenses Mrs. Barker spent the following amounts from Nov. 11 to Dec. 11, 1916: House rent, $16.50; lights (gas), 50 cents; fuel (coal), $2.75; telephone, $1.50; food, $20.10; miscellaneous, $1.65, making a total of $43. The cost of clothes was not included, as this is difficult to analyze in one month. In introducing Mrs. Barker's story, *The Railwayan* expresses a desire to hear of other housewives' records, and states that the publication is as much for the wives, mothers and daughters of the employees as for the men themselves.

Complaint Alleging Improper Heating Dismissed.—The charge against Timothy S. Williams, president, and Slaughter W. Huff, vice-president, of the Brooklyn (N. Y.) Rapid Transit Company, and two minor officials, that they had violated an order of the Public Service Commission, directing them to maintain car temperatures of at least 40 deg. was dismissed on March 13 by the Justices of Special Sessions in Brooklyn, upon motion of Darius Marsh, counsel for the defendants. Mr. Marsh moved for dismissal on the ground that it had not been proved that the officials of the company had had knowledge of the condition of the car in question, which was operated on the Bay Ridge Avenue line on Dec. 30, last. Harry E. Lewis, District Attorney of Kings County, who brought the complaint, said that if such a course was sustained it would make a farce of the Public Service Commission laws. He added that eight other similar complaints would be pressed for trial.

Personal Mention

L. W. Jacques has been appointed master mechanic of the East St. Louis & Suburban Railway, East St. Louis, Ill.

Frank A. Henning has been appointed supervisor of the Niagara Falls (N. Y.) local lines of the International Railway.

Edward Scranton has succeeded Worth A. Baldwin as passenger agent for the Union Traction Company at Muncie, Ind.

T. P. Mason, comptroller of the Havana Central Railroad, Havana, Cuba, has been appointed acting general manager, succeeding R. M. Orr, deceased.

S. D. Jackson, maintenance and construction foreman on the Anderson (S. C.) Branch of the Southern Public Utilities Company, Charlotte, N. C., has resigned from railway service.

John T. Benson has been appointed manager of Norumbega Park to succeed Carl Alberte. Mr. Benson has had extensive experience in securing and handling wild animals for menageries.

H. M. Schumpert has been promoted to the position of foreman of construction and maintenance of lines located at Anderson, S. C., for the Southern Public Utilities Company, Charlotte, N. C., succeeding S. D. Jackson.

Lawrence I. Grinnell has resigned from the editorial staff of the ELECTRIC RAILWAY JOURNAL to become connected with the Goldschmidt Thermit Company, New York, N. Y. Mr. Grinnell was graduated from Harvard and was connected with the *Railway Age Gazette* before he became a member of the staff of this paper.

Frank Hedley, vice-president and general manager of the New York Railways and the Interborough Rapid Transit Company, New York, N. Y., is a patient in the Post-Graduate Hospital, that city, recovering from an operation performed on March 12 for mastoid trouble. Mr. Hedley's condition is reported as satisfactory.

Albert R. Bailey, assistant professor of civil engineering of the University of Michigan, who has made a specialty of valuation work in connection with electric railways and other properties, has been granted a leave of absence for the remainder of the year to allow him to take a position with F. W. Stevens, general valuation counsel for the New York Central Lines. After March 19, Professor Bailey's headquarters will be at Grand Central Terminal, New York City.

A. P. Ramstedt, former president of the Idaho Public Utilities Commission, has resigned as a member of that commission to become general auditor and comptroller of the Day Mining interests. These include the Hercules Mining Company, Tamarack & Custer Consolidated Mining Company, and other mining companies in Idaho and British Columbia, the Northport Smelting & Refining Company, Northport, Wash., the Pennsylvania Smelting Company at Pittsburgh, Pa., and various banking interests in Idaho and Washington.

Harry Branson, recently superintendent of equipment for the Lehigh Valley Transit Company, Allentown, Pa., has been appointed master mechanic of the Wheeling (W. Va.) Traction Company. Before assuming charge in the position he has just relinquished, Mr. Branson had been connected for seventeen years with Philadelphia (Pa.) Rapid Transit Company. He was a carhouse foreman for six years and in charge of one of the company's shops for four years, after which he was appointed assistant general manager in 1909 with the title of superintendent of rolling stock and equipment. He held this position until 1913 when he entered the service of the Lehigh Valley Transit Company in a similar capacity.

James B. Woodyatt, who has been appointed general manager of the Southern Canada Power Company, Montreal, which owns the Sherbrooke Railway & Power Company, operating the street railway, and other utilities in Sherbrooke, Que., was born at Brantford, Ont., July 2, 1886. He was, from April to July, 1905, chainman for the Niagara & Welland Power Company; from July to September, 1905, topographer for the Toronto & Hamilton Railway, and from April, 1906, to December, 1908, an apprentice of the Canadian Westinghouse Company, Hamilton, Ont. From December, 1908, to June, 1909, Mr. Woodyatt was investigating ice conditions in the Gulf of St. Lawrence for the Dominion Government. From June, 1909, to June, 1910, he was sales engineer of Allis-Chalmers-Bullock, Ltd., Montreal. In June, 1910, he was appointed superintendent of power for the Sherbrooke Railway & Power Company and from July, 1913, to October, 1916, was general superintendent of this company.

Lily J. Spangler, who has been connected with the Virginia Railway & Power Company and its predecessors at Norfolk, Va., for more than seventeen years, has resigned to enter other work. Mrs. Spangler served first as stenographer and cashier in the office of the gas company in Norfolk. This was before the consolidation of the local gas company there with the other utilities. When E. C. Hathaway went to Norfolk in 1902 to take charge of the consolidated properties under the name of the Norfolk, Portsmouth & Newport News Company, Mrs. Spangler was appointed secretary to him. During the time that John Blair MacAfee was president of the Norfolk & Portsmouth Traction Company, from 1908 to 1911, Mrs. Spangler acted as his chief clerk. When the publication of *Public Service Chat*, intended for general distribution to the public, was started in February, 1914, Mrs. Spangler became the editor of the paper. Part of the material used in that publication was written by Mr. Hathaway, but a goodly portion of it was written by Mrs. Spangler herself, subject to approval by Mr. Hathaway.

James P. Barnes, general manager of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., has been appointed general manager of the Schenectady (N. Y.) Railway, to succeed James F. Hamilton. Mr. Barnes is a native of Syracuse, N. Y., and was graduated in 1905 from the Massachusetts Institute of Technology. For about six years he served in various capacities with the Oneida (N. Y.) Railway and the Syracuse Rapid Transit Company. While associated with the latter company he was responsible for the layout and construction of the Wolf Street shops in Syracuse, and he also assisted in the electrification of the West Shore Railway. In 1912 he resigned the position of chief engineer of the Syracuse Rapid Transit Railway to become general manager of the Syracuse & Suburban Railway, and later was appointed to the position which he has just relinquished. Mr. Barnes has demonstrated a rare ability in the several executive positions he has held. In June, 1916, he was elected president of the New York Electric Railway Association, and has shown an unusual interest in the problems confronting the industry at the present time.

JAMES P. BARNES

J. P. Pulliam, general manager of the Eastern Wisconsin Railway & Light Company, Fond du Lac, Wis., and the Wisconsin Electric Railway, Oshkosh, Wis., has tendered his resignation. Mr. Pulliam entered railroad work when he was fourteen years of age. His first position was as a telegraph operator on the Louisville Southern Railroad. He was subsequently employed in various capacities by the Kentucky & Indiana Bridge Company, after which he became chief clerk to the superintendent of the Louisville-St. Louis line of the Southern Railway, and the year following was employed by the Choctaw-Oklahoma-Gulf Railroad of Shawnee, Okla. Later he engaged in commercial pursuits for one year, and then served as trainmaster for the Grand Rapids, Grand Haven & Muskegon Railway for three years, when he became superintendent of the Winnebago Traction Company, Oshkosh, Wis. When the Wisconsin Electric Railway purchased the Winnebago Traction Company in 1908, Mr. Pulliam served the former company and the Eastern Wisconsin Railway & Light Company as general superintendent. In June, 1910, he was appointed general manager of the two companies, the position he has just relinquished.

A. L. Neereamer

A. L. Neereamer, secretary-treasurer of the Central Electric Railway Association since March 26, 1908, was again continued in his important office at the recent annual convention. Mr. Neereamer holds a unique position in the affairs of the association and its subsidiaries, for by constitutional provision of the individual bodies he is made permanent chairman of the Traffic Association and permanent treasurer of the Accountants' Association, and in this manner binds the three organizations into a single unit following three separate studies, yet all working for the advancement of the whole. When he became secretary of the Central Association, the traffic organization had been conceived but had not been born. Some of the most important work of the association was later to be done through this body with Mr. Neereamer as its sponsor. The joint baggage tariff, joint passenger tariff now under revision, the interchangeable mileage ticket, the Central Electric Railway Association map now being brought up to date, etc., are examples of the real work of this body. In this connection Mr. Neereamer's former broad experience in steam railroad accounting and traffic work, and electric railway traffic and transportation work has served him and the association well. The Accountants' Association, in which he has also carried a share of the burden, was organized and continued as a separate association until the beginning of 1915, when it was joined with the main body and has since acted in conjunction with it through Mr. Neereamer.

A. L. NEEREAMER

In this compilation and revision of tariffs, in the labor of making the map and the joint time table folder, and now the monthly publication of the latter, Mr. Neereamer has been a tireless worker and has almost single-handedly taken care of all the mass of routine work, correspondence and study which is represented but not seen in the finished product. Past-President George Whysall tells of how during the early days of the association, when the membership was small and the funds very limited it looked at one time as though the association must fail. Three or four of the railway men, however, decided to put up enough money to carry the work on another year, and to make this possible the secretary offered to draw only enough salary to cover only his own personal and direct family expenses. It is generally recognized now that it was this spirit of interest and faith in the development of the electric railways that made possible the continuation and success of the Central Electric Railway Association, which may indeed count itself fortunate in having retained so long the services of Mr. Neereamer.

Obituary

R. M. Orr, general manager of the Havana Central Railroad, Havana, Cuba, is dead.

Otto Armbruster, who for the past ten years has been claim adjuster for the New Orleans Railway & Light Company, New Orleans, La., died recently at the age of fifty-two.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Northern Alabama Traction Company, Florence, Ala.**—Incorporated in Alabama to construct an electric railway from Florence to Huntsville, via Athens. Capital stock, $2,000. Incorporators: Solan L. Whitten, Tracy W. Pratt and Thurston H. Allen.

FRANCHISES

Oakland, Cal.—The San Francisco-Oakland Terminal Railways has filed with the City Council application for a resettlement franchise to take the place of the many franchises granted under Oakland's former charter and which expire at different times.

Altanta, Ga.—The Federal Construction Company will ask the City Council of Atlanta to renew a contract between the company and the city, extending the time until April 25, 1918, by which the company may begin actual construction work on its proposed line in Atlanta. The company proposes to construct a line from Atlanta to Creighton. [May 6, '16.]

***Silver City, N. M.**—The Empire Zinc Company has received a franchise from the City Council to construct an electric railway in Silver City.

Chillicothe, Ohio.—The Hillsboro, Cynthiana, Bainbridge & Chillicothe Traction Company, which proposes to construct a line from Hillsboro to Chillicothe, has asked the City Council for a new franchise under which it may operate its cars through Chillicothe. The old franchise granted this line has expired. J. C. Anderson, Chillicothe, secretary. [Jan. 27, '17.]

Youngstown, Ohio.—The Mahoning & Shenango Railway & Light Company has asked the City Council of Youngstown for a franchise to construct an extension of its line in Mahoning Avenue from the present terminus at Calvary Cemetery to Perkins Corners.

Irwin, Pa.—The McKeesport & Irwin Street Railway has received a franchise from the Borough Council to operate in Irwin. The company is owned by the West Penn Railways. In Irwin it will have connection with the Pittsburgh, McKeesport & Greensburg Railway to Greensburg and the coke region and the Trafford extension, owned by the West Penn Railways.

Port Arthur, Tex.—The City Council of Port Arthur has passed an ordinance granting the Jefferson County Traction Company the right to make certain changes in its tracks on Waco Avenue and Austin Avenue, to enable cars to have access to the new terminals that are to be built by the company. The ordinance also grants the company the right to operate by contract or otherwise its cars on the tracks of the Port Arthur Traction Company and the Pier Railway Company, and such other extensions of tracks as may be constructed in the operation of a trolley system in Port Arthur. The franchise is granted for a period of fifty years.

San Antonio, Tex.—The San Antonio Traction Company has received permission from the Commissioners of Bexar County to construct an extension along Somerset Road.

TRACK AND ROADWAY

British Columbia Electric Railway, Ltd., Vancouver, B. C.—This company will shortly begin the construction of new tracks, a mile along the North Burquitlam Road, in compliance with the conditions of its Burnaby franchise.

Pacific Electric Railway, Los Angeles, Cal.—Grading work has been begun by the Pacific Electric Railway on its new LaHabra-Fullerton line, and it is expected that the extension will be ready for service by May 15.

Municipal Railway of San Francisco, San Francisco, Cal.—The Board of Works has advertised for bids, to be opened March 21, for approximately $14,000 worth of rail appliances to be used in the double-tracking of Market Street for the Municipal Railway.

Tidewater Southern Railway, Stockton, Cal.—Through sale of stock to the Western Pacific Railroad the Tidewater Southern Railway will have money available about April 1 to commence the construction of terminal facilities at Modesto and the electrification of the line between Modesto and Turlock, according to an announcement by Byron A. Bearce, president. The cost of electrifying the Modesto-Turlock line will be about $700,000, it is said.

Chicago, Milwaukee & St. Paul Railroad, Chicago, Ill.—This company contemplates the construction of a new double-track bridge at Sabula, Iowa, at a cost of about $3,000,000.

Des Moines (Iowa) City Railway.—Plans for extensive street railway construction work for the coming season have been announced by the Des Moines City Railway. Eleven miles of new track will be laid along old routes, and several new lines and extensions are on the improvement program for next summer. The construction of the Twenty-fourth Street viaduct, over High Street, will start the work on the new lines. Work on the viaduct, which will be of concrete construction, is to begin immediately. This will be the first step in the building of the new Crocker Street line, which will run north and west from Twenty-fourth Street and Ingersoll Avenue. Polk Boulevard and Chamberlain Avenue will be the terminal of the new line.

Arkansas Valley Interurban Railway, Wichita, Kan.—Preparations are being made by the Arkansas Valley Interurban Railway for the construction of 5 miles of track from Twenty-fourth Street to the Midland Valley Railroad depot. It is reported that the company's proposed line to Salina will be in operation by October.

Ocean City & Fenwick Island Railway, Ocean City, Md.—According to plans recently announced, this company's proposed trolley line connecting Ocean City and Fenwick Island will be in operation by the beginning of the summer. The road will be 11 miles long, and will be built for both passenger and freight service. Application will be made to the Public Service Commission of Maryland for permission to issue stock to the par value of $100,000. C. Edward Shute, Ocean City, secretary. [Feb. 10, '17.]

Bay State Street Railway, Boston, Mass.—This company has asked the Legislature for a two years' extension of time in which to place its feed wires underground in the thickly-settled section of Salem.

Detroit (Mich.) United Railway.—To the end that the rerouting plan may be placed in operation as speedily as possible for the relief of the congested condition of street railway traffic in the heart of Detroit, work on the track construction necessary for the plan is now under way. There are about thirty pieces of straight track or special work necessary to make the entire plan effective, and as the rerouting of one line largely depends upon the rerouting of some other line not much of the plan can be developed until all the physical connections are made.

Minneapolis (Minn.) Street Railway.—Mayor Thomas Van Lear has vetoed the two resolutions recently passed by the City Council ordering the Minneapolis Street Railway to construct the Seventh Street car line and a line across the Third Avenue bridge.

Helena Light & Railway Company, Helena, Mont.—This company plans the immediate improvement of its local lines, to include new ties and heavier rails. Work will cost between $60,000 and $80,000.

Public Service Railway, Newark, N. J.—This company plans to double-track its line from Magnolia to Clementon, 6 miles, at a cost of about $65,000.

Brooklyn (N. Y.) Rapid Transit Company.—The Public Service Commission for the First District of New York has saved the City of New York approximately $58,000 by readvertising for bids for the relocation of the surface railroad tracks on New Utrecht Avenue, Brooklyn. On Feb. 7 the Commission received only one bid upon a proposed contract for the relocation of the tracks. By changing the terms of the contract slightly when bids were reopened on March 5 several bidders made proffers, the lowest being that of the Thomas Crimmins Contracting Company, New York, whose figure was $165,409, or approximately $58,000 less than the single offer received on Feb. 7. The tracks in question which are to be moved are those formerly used by the cars of elevated trains operated by the Brooklyn Rapid Transit Company on the West End line.

Interborough Rapid Transit, New York, N. Y.—A series of contracts has been awarded the Union Switch & Signal Company, Swissvale, Pa., by the Interborough Rapid Transit Company to provide interlocking and automatic block signal apparatus on several of its lines. All the interlocking plants will be of the electro-pneumatic type. The interlocking signals on the suburban and elevated lines will be of the electro-pneumatic semaphore type, with electro-pneumatic stops used throughout; the automatic block signals in the subway will be of the Interborough light type, and those on the suburban and elevated lines of the daylight type with color indication.

New York & Queens County Railway, New York, N. Y.—This company has agreed to begin construction in April, 1918, of the trolley line through Flushing Avenue, from Ehret to Jackson Avenue, which it abandoned some time ago. The agreement was contained in a stipulation filed with Justice Aspinall in the Supreme Court in the mandamus action brought by the Public Service Commission, after the company had declined to resume operation of the road. The line was discontinued in 1915, when the work of filling in the Flushing meadows was begun. The line had been operated on a trestle and the creation of solid land would have vested the company with a franchise to operate cars over it, along the line of the old trestle. The railroad company declined to resume the line, however, saying it did not pay. It also declined to construct a temporary detour.

Union Railway, New York, N. Y.—This company has applied to the Board of Estimate and Apportionment for permission to construct, maintain and operate a double-track extension from a connection with the existing route of the company in West 207th Street, along Amsterdam and Nagle Avenues and Dyckman Street to the right-of-way of the New York Central Railroad, at the foot of Dyckman Street. A preliminary hearing upon the petition will be held March 23.

Willamette Valley Southern Railway, Oregon City, Ore.—Plans are being considered by the Willamette Valley Southern Railway, which is controlled by the Portland Railway, Light & Power Company, for the construction of an extension from Mount Angel to Silverton. It is estimated that the cost will be approximately $120,000.

Philadelphia, Pa.—Sealed proposals will be received by the Department of City Transit, Philadelphia, Pa., William S. Twining, Director, until April 3, for the construction of the following sections of the Broad Street subway: Contract No. 103—575 lin. ft. of two-track and 2500 lin. ft. of four-track subway in Broad Street, from south of Filbert Street to Buttonwood Street, including one station; contract No. 104—4086 lin. ft. of four-track subway in Broad Street, from Buttonwood Street to north of Stiles Street, including three stations; contract No. 204—2960 lin. ft. of four-track subway, merging into two-track subway, in Broad Street, from South Penn Square to south of South Street, including two stations. Copies of plans and specifications may be obtained upon deposit of $50, to be refunded upon return of plans.

Charleston Consolidated Railway, Gas & Electric Company, Charleston, S. C.—Work has been begun by this company on the construction of a double-track line on Clements Ferry Road.

***Austin, Tex.**—It is reported that the Stone & Webster interests plan to construct an interurban line from Austin to San Antonio.

Dallas (Tex.) Southwestern Traction Company.—At a recent meeting of the stockholders of the Dallas Southwestern Traction Company, E. P. Turner was re-elected president; E. L. Sargent, Samuel P. Cochran and B. M. Sansom were elected vice-presidents; John T. Witt, chief engineer, and J. E. Bassett, secretary and treasurer. The executive committee consists of J. J. Carter, Samuel P. Cochran and John L. Cleveland. [Nov. 18, '16.]

Tacoma (Wash.) Municipal Railway.—With a tacit understanding that a bill permitting the city of Tacoma to extend its municipal car line to the proposed army post at American Lake, will be passed by both houses of the Legislature, now in session at Olympia, Mayor Fawcett and the City Council are considering plans for extending the tideflats car line from its present terminus at the city limits to the locality proposed for the shipyards center. The proposed bill prohibits cities from extending municipal street car lines more than 3 miles from the city limits, but a proviso was attached permitting the extension of the city line to the army post.

SHOPS AND BUILDINGS

New York State Railways, Syracuse, N. Y.—A car storage yard, accommodating sixty cars, including repair shop and building for trainmen, will be built by the New York State Railways at Burnet and Fairview Avenues, Syracuse, at a cost of about $125,000.

Wilkes-Barre & Hazleton Railway, Hazleton, Pa.—Bids have been asked by the Wilkes-Barre & Hazleton Railway on the erection of a large freight station on its newly acquired land west of Hazleton.

POWER HOUSES AND SUBSTATIONS

Georgia Railway & Power Company, Atlanta, Ga.—This company contemplates the installation of a power station and the erection of electric transmission lines in the Emerson district.

Iowa Railway & Light Company, Cedar Rapids, Iowa.—This company will erect a high-tension electric line from its plant at Nevada to the Dayton Lake Amusement Park, 11 miles, to furnish electricity for light and power to the park, as well as the farmers along the line. Plans are also being made to extend the line through Gilbert to Story City.

Twin City Rapid Transit Company, Minneapolis, Minn.—Plans have been completed by the Twin City Rapid Transit Company for the erection of a new substation 200 ft. by 240 ft., in St. Paul, to cost about $25,000.

Federal Light & Traction Company, New York, N. Y.—This company has purchased a site for the erection of a $250,000 substation at Springfield, to be used to relay the hydroelectric power now being supplied to the Springfield Gas & Electric Company from the White River dam. The proposed equipment includes a new 5000-kw. turbine.

Interborough Rapid Transit Company, New York, N. Y.—Plans have been made by the Interborough Rapid Transit Company for the construction of a two-story, 49 ft. x 108 ft. brick transformer station and telephone exchange at 122-126 Park Row, to cost about $45,000.

Richmond Light & Railroad Company, New York, N. Y.—Application has been made by the Richmond Light & Railroad Company for permission to install two new cable lines across Fresh Kill Creek to Lake Island, to be used for the operation of a proposed garbage disposal plant.

Pittsburg County Railway, McAlester, Okla.—This company, which operates McAlester street car lines and line between South McAlester and North McAlester, will install a new 3500-kw. turbo-generator in the power house of the company at Ninth Street and Johnson Avenue in McAlester.

Conestoga Traction Company, Lancaster, Pa.—Plans have been prepared by this company for improvements to its plant and system, which will include the installation of new rotary converter equipment in the Orange Street station and a 15,000-kw. transformer bank installation at the Engleside power plant, to cost about $125,000.

Texas Electric Railway, Dallas, Tex.—A new $750,000 power plant will be built by the Texas Electric Railway and the Texas Power & Light Company on the north bank of the Red River in Oklahoma, 5 miles north of Denison, as soon as the United States Bureau of Indian Affairs approves the proposition. The Legislature of Oklahoma has already given authority for the construction of the plant.

Rutland Railway, Light & Power Company, Rutland, Vt.—A new 13,000-volt line is being built by this company to connect with the line of the Western Vermont Power & Light Company, a subsidiary.

Manufactures and Markets

Discussions of Industrial Conditions
A Department for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Business Announcements Trade Literature

Importance of Purchasing Manufacturers' Standard Electrical Apparatus

Low Cost and Best Delivery on Standard Equipment—Railways Foreseeing Requirements—Large Orders Expected During Present Year

BY J. G. BARRY
Manager Railway Department General Electric Company

Various elements in present market conditions are taxing the capacity of manufacturers of electrical apparatus to the utmost and as a result are substantially increasing the cost of the finished product and making early deliveries most difficult. Owing to the unprecedented demand for raw materials, the electrical manufacturer must place orders many months in advance of requirements and in addition face the uncertainty of transportation due to congestion of terminals, embargoes, etc.

The general prosperous business conditions have resulted in the placing of unusually large orders by railway companies during 1916 and at present. Inquiries indicate that railway equipment orders likely to be placed during 1917 will exceed orders booked for 1916. On account of these conditions railway companies which have not anticipated their requirements well in advance will be unable to obtain deliveries of apparatus sufficiently early to meet their requirements if apparatus not standard with the manufacturers is desired.

The advantages accruing to both the manufacturer and to electric railways by the purchase of standard apparatus are very great. Frequently a piece of electrical equipment requires a dozen or more different raw materials including steel bars, shapes and plates, rolled or drawn sections of copper, malleable or cast iron in various forms, composition castings and various kinds of insulating materials. Preliminary work must be done on most of this material before final fabrication, involving the use of molds, dies, punches, jigs, tools and machining. Deviations from the standard line must necessarily delay production and appreciably increase costs.

MANY MATERIALS IN DEMAND

The greatest difficulties have been experienced in securing material: for example, the delivery on some grades of sheet steel is now about twenty-six weeks as compared with four to six weeks under normal conditions. Deep stamping steel cannot be obtained. Even greater difficulty has been encountered in securing linen tape for the insulation of armature and field coils. In regard to electrical asbestos cloth and tape, formerly woven in England, the price is more than six times that paid in 1915, and, furthermore, it is impossible to purchase tape in large amounts. White mica for commutators formerly imported from India is no longer in the market and it is therefore necessary to use amber mica from Canada. While this substitute is equally serviceable and, on account of its greater density, tends to give a tighter commutator, considerable difficulty has been encountered owing to the lack of skilled hands capable of splitting the mica into the desired sheets. One of the important raw materials which has caused delay is copper wire or cable used for car equipments. Orders for this material cannot be filled in less than about six months and special sizes are likely to require a longer time.

With the present volume of business the manufacturer is able to purchase standard materials in large quantities and a long time in advance, thus producing at minimum cost and securing reasonable delivery. The manufacturer of small lots of any type of apparatus and special parts will incur greatly increased costs, notably in the expense for setting up tools, jigs and machine fixtures. It may readily be appreciated that the manufacture of any special apparatus will delay the production of standard articles, reduce the output of the factory and consequently disrupt the entire process of production. It is evident, therefore, that the purchaser will gain both in delivery and price by ordering from the manufacturer apparatus which is standard.

An important consideration in the use of standard apparatus is the purchase of supply parts which are more likely to be carried in stock and can therefore be secured without waiting for manufacture. Greater refinement is also obtained in the complement of tools, jigs, dies, etc., used in the production of standard articles insuring perfect interchangeability of parts.

Purchasers of steam turbo-generating equipment have apparently foreseen their requirements for some time in advance, orders being booked for as long as two years from the present date. This equipment in the main is standard with the manufacturer and material can be ordered sufficiently in advance to meet schedules. Many purchasers of railway substation equipment are inclined to depart from standard products, thus encountering the same delays on motor-generators and synchronous converters as on railway motor equipments. In the case of switchboards, panels of special dimensions are sometimes required preventing the manufacturer from selecting material from stock.

Railways Face Hardships

Manufacturers Raise Prices, but Railways Cannot Follow—High Prices Prevent Big Increases in Business

BY B. A. HEGEMAN, JR.
President National Railway Appliance Company

That the railways of the country are facing hardships and will continue to struggle along until relief is obtained either through the lowering of prices or through the increase in rates, cannot be emphasized too strongly. Unless the Federal and State Government recognize this fact and permit the railways to charge more for their service, the railways cannot keep from being affected seriously in the near future. The manufacturer has increased the cost of his products with each increase in the cost of raw material, but the railway is not permitted to increase its fare. Another item of importance that must be taken into account is the increasing number of automobiles used for pleasure purposes. This does not include jitneys. There is not a day passes but that the railways lose many nickels on account of automobile owners inviting their neighbors or friends to jump in and ride down to work with them.

NEW BASIS FOR QUOTATIONS AND DELIVERY

At the present time, no quotations are made by the manufacturer except for immediate acceptance. This is the only course open to the manufacturer as he in turn must obtain all his raw material on the same basis. This company, whose principal products are tool steel gears and pinions, Johnson fare boxes, Perry side bearings, Hartmann centering plates, Wasson trolley bases, Garland ventilators, C. & C. electric arc welders, and railway varnishes and enamels, formerly had a considerable supply of its products on hand and was able to make prompt deliveries. Many of these accessories were made up in lots of one thousand each, but owing to the extensively high prices of raw materials, they are now made up to meet actual requirements. On most of the products, deliveries can be made within six weeks or two months. On the varnishes and enamels, however, orders can usually be supplied from present stocks. Prices have been increased steadily, and owing to the prevailing high prices, the railways are buying only absolute necessities.

MONEY-SAVING DEVICES BEST SELLERS

One of the largest economies being effected by railways at the present time is possible through the use of arc welding machines. They usually pay for themselves within a short time. Their most valuable use is to reclaim those broken parts which usually are thrown on the junk pile. Sales have been made to many railways of anti-friction, center or side bearings, and the prospects for the sale of this product are very good for the next year.

The railways are now showing more interest in buying as they have come to realize the conditions of traffic and the tendency of the market. At the present time the need for equipment on many roads is imperative, and much old equipment which is now in use will be promptly discarded as soon as prices are such that new equipment can be purchased. If war is declared, this need for rolling stock will be emphasized all the more, and as a consequence the roads will have to buy more equipment. In the general line of defense the electric railways will be utilized for transporting troops and supplies wherever it is found that they can be used advantageously.

Market for Used Machinery Never Better

Country Being Scoured for Equipment in Good Operating Condition—Demands Cannot Be Supplied—All Business Done on Cash Basis

BY FRANK MACGOVERN
President MacGovern & Company

During the last two years a marked expansion in different lines of the industrial world has been universally observed. Extraordinary demands have made for a condition which strikes the keynote of preparedness. Everywhere large additions have been made not only to establish enterprises but new fields of activity have sprung into life through necessity. New markets have been opened up to us, others have been largely confined to us, and at home we have been called upon to supply products which heretofore have been obtained through importation. These conditions have multiplied the need for power machinery far beyond the manufacturers' capacities to supply these needs within a reasonable time of delivery. Central service stations have been pushed to the utmost to meet the increased requirements for power. During 1916 additional generating capacity to the extent of 2,500,000 kw. was added to plants throughout the country. During the same year there was an increase of 23 per cent in kilowatt-hours generated and sold. Indications are that the central stations had combined gross revenues of over $500,000,000, an increase of 15 per cent over the previous year.

DEMAND FOR POWER EQUIPMENT

It was not to be expected that large enterprises could have foreseen before the advent of changed business conditions the extraordinary demands which were to be made upon them for power equipment, and therefore their ability readily and quickly to increase their capacities to meet the requirements were limited. Unquestionably there has been a tremendous speeding up in production, but in some cases the attractiveness of a few war contracts has diverted from the possibilities of concentrating more thoroughly on the production of power machinery. All this has augmented the demand for used power machinery of every description, ranging from machines of small capacity to single generating units of 10,000 to 15,000 hp. capacity, chief among which are turbo units, reciprocating units, rotary converters, motor generator sets, frequency changers, transformers, induction and direct-current motors, boilers, pumps and condensing equipment.

The used equipment business is peculiar. It must keep in touch with a diversified class of equipment including electrical, hydraulic, steam and gas power equipment. Were it not for the fact that this business had been built up, not necessarily from the standpoint of purchasing apparatus for re-sale, but more particularly in the nature of handling the necessary engineering details attending both the purchase and subsequent sale of the same, the uninterrupted production could not have been enjoyed by many who have turned to the used market for power equipment. Therefore this business has served its purpose in having contributed largely to the end that production can go on without delay. Moreover the practicability of installing high grade used electrical and steam power machinery has been proved to many whose needs for power equipment have had to be cared for with the utmost dispatch. Time was when used equipment was looked upon as something cast aside as no longer useful. There are many to-day, however, who have learned that this is not the case, but it needed just such a condition which has prevailed during the past two years to convince them to the contrary. Not only has a saving in price to purchasers been effected, but their requirements have been cared for promptly which otherwise would have been most difficult.

PROBLEMS INVOLVED IN PURCHASE OF USED EQUIPMENT

A large quantity of useless apparatus has been broken up for scrap because of a good metal market and this condition has made possible a better selection of saleable equipment for the reason that obsolete and no longer useful apparatus could be disposed of as metal. The saleable equipment has therefore been retained for immediate use. Everything purchased must necessarily be closely inspected by competent men who by reason of special training and experience are able to note hidden defects and provide for possible repairs in the purchase price. Freight rates, conditions for removal, possibilities for quick disposal and a hundred other trade conditions are necessary before a purchase is consummated. The business itself should be conducted on a cash basis in so far as possible. This refers to both purchases and sales. Any other terms of payment would not be attractive to a company who realizes the uncertainty of the present demand. Conditions of the times are intensifying the need of a used market. Therefore, this company buys only for cash and in this respect is unique in so far as its obligations are concerned. This is a remarkable business especially when one appreciates that in 1916 used power equipment was traded in to the extent of $50,000,000, which otherwise through the lack of a well built up market would have gone into the scrap heap or have laid idle for a considerable length of time to become possibly obsolete and necessarily to deteriorate in value.

MARKET FOR USED EQUIPMENT EXCELLENT

Owing to the fact that a good sound market has been created for the disposal of apparatus it has been possible for a vast amount of apparatus to be gathered together on more scientific lines than heretofore. It is thus made use of at a time when more than ordinary profits have been taken by the buyers. This has not only benefited the manufacturers themselves, but thousands upon thousands of skilled labor employees. The market conditions at present are possibly as good and sound as they ever will be. There must, however, come a time when business in general will settle down to normal transactions and when that time comes the values of to-day will depreciate materially. We are constantly called upon to supply apparatus which we do not have in stock at the moment. The wise owners of unused or obsolete apparatus would do well to list it for its ultimate disposal and that without delay. It necessarily follows that opportunities for quick disposal are everywhere apparent and we know of no better market conditions for the future than those which we are experiencing to-day in reviewing our daily correspondence.

Conservation, preparedness and business thrift are three salient factors upon which the bulwark of the used power equipment business has been established. The secret of successful operations in this line of business endeavor is solely dependent upon the power of distribution. It is a very simple matter to buy up tremendous quantities of apparatus, but to survive and thrive this apparatus must be disposed of. Each and every business transaction negotiated for must ultimately be consummated with satisfaction existing on both sides and any other kind of business policy cannot hope to succeed.

Large Subway Car Order Taken by Pullman

Details of Recent Bids for Interborough Car Bodies, Motors and Trucks

As noted in the ELECTRIC RAILWAY JOURNAL of March 10, the bids for the car bodies have been opened and the Pullman company was awarded the order, subject to the approval of the Public Service Commission. Bids were received on motor-car bodies, trail-car bodies, motor trucks and trailer trucks. The lowest bid on the motor-car bodies with all accessories included as specified by the railway, as submitted by the Pullman company, was $4,670, the next lowest, as submitted by another carbuilder, $4,965 and the highest bid $5,795. On the trail-car bodies, these bids were $4,555, $4,765 and $5,594 respectively, the lowest bid being the Pullman bid.

Bids on the trucks varied according to the deliveries promised. The lowest two bids for motor trucks were $1,126 and $1,130 and for trailer trucks $904 and $934. Although one bidder's estimate was $137 less on trucks than the Pullman bid which provided for the use of the Commonwealth Company's cast-steel frame, the delivery was not quick enough to satisfy the railway company.

Delivery on cars has been promised by the Pullman Company at the rate of five cars and ten trucks per day beginning eight months from date of the placing of the order. Three of the bids for cars provided for delivery in six months of the rate of six, five, and three cars per week respectively, one bid provided for delivery in seven months of six cars per week, one bid provided for delivery in eight months of from ten to twelve cars per week and one bid promised eight cars per week in thirteen months.

The order for motors was divided equally between the General Electric Company and the Westinghouse Electric & Manufacturing Company. The first named company will furnish 337 GE-260 motors of 200 hp. each and 168 Sprague-General Electric d.c. control equipments, while the Westinghouse Company will supply 337 type 577R motors and 168 sets of ABFD automatic battery field drum control equipments. Each of the above orders for motors amounts to more than $1,000,000.

PREVIOUS INTERBOROUGH ORDERS TO PULLMAN

The following statements in regard to the order are based on an interview with an official of the Pullman Company.

The car-manufacturing plants of the Pullman Company are located in the southern part of the Chicago industrial district. These plants are engaged in building and repairing cars for Pullman sleeping and parlor-car service, also in building steel freight cars and steam-railroad passenger coaches. In recent years the Pullman Company is said to have built about 70 per cent of the steam-railway passenger cars ordered from car builders for service in this country. These great plants have grown with the transportation industry and include the most modern equipment for economical and fast work.

So far as the electric railway field is concerned the Pullman Company has shown interest only in the larger car orders. That is, orders of equipment that have been fairly well standardized for large lots. During the rehabilitation period of the Chicago Surface Lines, it ordered from the Pullman Company 950 large double-truck pay-as-you-enter street cars of a standard design, with steel underframes and wood superstructures. The Interborough Rapid Transit Company has placed other large orders with the Pullman Company. In March, 1915, when steam-railroad car-building work was slack, the manufacturing department of the Pullman Company received an order from the "Interborough" for 478 car bodies and 974 trucks, and in November of the same year another order from the same company was received for 311 bodies, 246 motor trucks and 405 trailer trucks. The entire lot of 789 bodies was of one design. The production capacity of the company is better realized when it is stated that these all-steel subway cars were manufactured complete at the rate of ten per day.

The order for which bids were recently received includes 377 motor car bodies, 140 trail car bodies, 337 motor trucks and 617 trailer trucks. Delivery is contingent upon the availability of steel and other construction materials. No work will be done on the construction of the bodies until October, 1917, when shop capacity will be available at the Pullman works for building at least five cars a day.

Inasmuch as the Pullman Company's manufacturing plant is just completing the construction of nearly 800 of this design of steel subway car it was in the best position to quote on the new lot. Shop procedure and production costs for this design were well understood and the Pullman Company has a complete equipment of dies and templates for the proportionately large number of special pressings and forgings incorporated in the subway car design. The trucks included in the recent order for subway cars are to be built by the Pullman Company. The design differs from that heretofore used by the subway. The new trucks will include the Commonwealth Steel Company's cast-steel frames.

President Names New Tariff Board

President Wilson has selected the following men to serve as members on the new tariff board: W. S. Culbertson, Kansas; William Kent, California; David J. Lewis, Maryland; E. P. Costigan, Colorado; Daniel Roper and Prof. Frank Taussig. Professor Taussig, who will act as chairman, has held the chair of political economy at Harvard. Mr. Culbertson was formerly in the legal department of the Federal Trade Commission and is considered an expert in tariff matters.

CURRENT PRICES FOR MATERIALS

Quoted Wednesday, March 15

Copper (electrolytic)	New York,	36 cents per pound
Rubber-covered wire (base)	New York,	40 cents per pound
No. 0000 feeder cable (bare)	New York,	37½ cents per pound
No. 0000 feeder cable (stranded)	New York,	35 cents per pound
No. 6 copper wire (insulated)	New York,	37½ cents per pound
No. 6 copper wire (bare)	New York,	37 cents per pound
Tin (straits)	New York,	54 cents per pound
Lead	New York,	9½ cents per pound
Spelter	New York,	10¾ cents per pound
Rails, A. S. C. E., O. H	Mill,	$40 per gross ton
Rails, A. S. C. E., Bess	Mill,	$38 per gross ton
Wire nails	Pittsburgh,	$3.20 per 100 pounds
Steel (bars)	Pittsburgh,	3¾ cents per pound
Sheet iron (black, 24 gage)	Pittsburgh,	4.85 cents per pound
Sheet iron (galv., 24 gage)	Pittsburgh,	6.55 cents per pound
I-beams over 15 in.	Pittsburgh,	10 cents per pound
½-in. galv. extra high strength steel wire,	New York,	$7.04 per 100 ft.
⅜-in. galv. high strength steel wire	New York,	$3.52 per 100 ft.
⅜-in. galv. Siemens-Martin wire	New York,	$2.60 per 100 ft.
5/16-in. galv. Siemens-Martin wire	New York,	$2.00 per 100 ft.
Galvanized barb wire and staples	Pittsburgh,	4.05 cents per pound
Galvanized wire (ordinary)	Pittsburgh,	3.85 cents per pound
Cement (carload lots) with rebate for sacks,	New York,	$2.02 per barrel
Cement (carload lots)	Chicago,	$2.06 per barrel
Cement (carload lots)	Seattle,	$2.60 per barrel
Sand in large lots	New York,	50 cents per ton
Linseed oil (raw, 5-bbl. lots)	New York,	$1.01 per gallon
Linseed oil (boiled, 5-bbl. lots)	New York,	$1.02 per gallon
White lead (100-lb. keg)	New York,	10¼ cents per pound
Turpentine (bbl. lots)	New York,	50 cents per gallon

OLD METAL PRICES

Copper (heavy)	New York,	30 cents per pound
Copper (light)	New York,	24¾ cents per pound
Red brass	New York,	20 cents per pound
Yellow brass	New York,	19 cents per pound
Lead	New York,	8 cents per pound
Zinc		8 cents per pound
Steel car axles	Chicago,	$34 per net ton
Iron car wheels	Chicago,	$18 per gross ton
Steel rail (scrap)	Chicago,	$26.50 per gross ton
Steel rail (relaying)	Chicago,	$34 per gross ton
Machine shop turnings	Chicago,	$9.25 per net ton

ROLLING STOCK

Jamestown (N. Y.) Street Railway had a double-truck car, valued at $7,000, destroyed in a fire which damaged the building and other cars to the extent of about $13,000.

Trenton & Mercer County Traction Company, Trenton, N. J., noted in the ELECTRIC RAILWAY JOURNAL of March 3 as being in the market for ten double-truck city cars, has placed the order with the J. G. Brill Company. These cars will seat forty-eight passengers, will be equipped with 26-in. wheels and 4 GE 258 motor equipments. The air brakes will be furnished by the Westinghouse Air Brake Company.

New York State Railways, Syracuse Lines, noted in the ELECTRIC RAILWAY JOURNAL of Feb. 24 as being in the market for twenty-five double-truck cars for city service, has placed the order for this equipment with the J. G. Brill Company. These cars are of the front-entrance, pay-as-you-leave type, and will cost in the neighborhood of $200,000. They will be equipped for two-car operation.

North Carolina Public Service Company, Greensboro, N. C., noted in the ELECTRIC RAILWAY JOURNAL of Feb. 3 as having ordered fifteen light-weight, single-truck, double-end cars from the American Car Company, has specified the following details for this equipment:

Seating capacity	28
Length over bumpers,	27 ft. 9½ in.
Length over vestibule,	26 ft. 9½ in.
Width over all	7 ft. 10 in.
Height, rail to trolley base,	11 ft. 7 in.
Body, wood, semi-steel or all steel	Semi-steel
Interior trim	Polished bronze
Headlining	Rafter finish
Roof, arch or monitor	Arch
Air brakes	Westinghouse
Axles	Brill
Bumpers	American Car
Car trimmings	Brill
Control, type	G. E., K-10-Q
Couplers	American Car pull bar
Curtain fixtures,	Curtain Supply Co.
Curtain material	Pantasote
Designation signs	Hunter
Door operating mechanism,	National Pneumatic
Gears and pinions	Westinghouse
Hand brakes	American Car
Heaters	Peter Smith (electric)
Headlights	Golden Glow
Journal boxes	Brill
Lightning arresters,	Westinghouse
Motors, type and number,	Two, West. 506-A
Motors, outside or inside hung,	Inside
Sash fixtures,	Dayton Manufacturing Co.
Seats, style,	American Car reversible
Seating material	Rattan
Springs	Brill
Step treads	Feralun
Trolley base	Westinghouse
Trucks, type,	Brill single, 78-M-1
Ventilators	Railway Utility Co.
Wheels (type and size),	24 in., cast chilled

TRADE NOTES

Chandler & Company, Inc., New York, N. Y., announces the removal of their offices to the sixth and seventh floors of the Franklin Bank Building, Philadelphia, Pa.

William A. Hayes has been appointed receiver of the Street Railway Signal Company, a $100,000 Delaware corporation doing business at Philadelphia, Pa. The appointment was made as a result of a creditors' bill of complaint which was filed recently asking for a receiver.

National Lumber Manufacturers' Association, Chicago, Ill., has established a retail service and has engaged men to make a study of retail conditions. Walter H. Bell and H. R. Isherwood are now constantly on the road working in conjunction with the manufacturers to develop their sales.

F. C. Stieler, who has been connected with the New York office of the Westinghouse Electric and Manufacturing Company for the past eight years, has resigned, effective March 15. He is now handling canvas conveying belting for the Imperial Belting Company, 42 Broadway, New York City.

Frank L. Gordon, Western sales manager, American Brake Shoe & Foundry Company, has been appointed assistant to the vice-president, with headquarters in Chicago, and L. R. Dewey, formerly a member of the sales department, has been appointed to succeed Mr. Gordon as Western sales manager, with headquarters in Chicago.

American Electric Tool Company, Petersburg, Va., at a recent meeting elected a new board of directors. The officers of the company are as follows: I. C. Shore, president; B. Mason Hill, vice-president; David A. Lyon, secretary and treasurer, and Louis Paulero, general manager. This company is engaged in the manufacture and sale of the Paulero electric hammer.

Joseph T. Ryerson & Son, Chicago, Ill., announce in connection with the readjustment of the departments heretofore under the direction of the late Edward T. Hendee the following appointments: C. E. Pynchon, manager of sales in the machinery department, including domestic and export, and Howard Gray, manager of sales in the railroad department.

Holden & White, Inc., Chicago, Ill., general sales agents for the Garland Ventilator Company, announce that an order has been received from the Cincinnati Car Company for 400 Garland ventilators for installation on new cars of the Public Service Railway, Newark, N. J. This company, also general sales agents for the Wasson Engineering & Supply Company, has received an order from Bion J. Arnold for twelve Wasson air-retrieving trolley bases for use on the Elgin & Belvidere Electric Company, which is owned by Mr. Arnold.

Peabody, Rice & Wilson, electrical engineers, Johannesburg, South Africa, announce that Philip Herd, Johannesburg, having entered into partnership with them, they shall henceforth cease to trade under the name of Peabody, Rice & Wilson. The title of the new firm will be: Rice, Wilson & Herd. Mr. Herd has been associated with the South African interests of the British Thomson-Houston Company, Ltd., of Rugby, and the General Electric Company of Schenectady, N. Y.

Frank B. Kennedy has joined the Dayton Fare Recorder Company, Dayton, Ohio, as sales manager. Mr. Kennedy has been located at New Haven, Conn., for the past twenty-two years with various manufacturers of fare collecting and registering devices. He began in this field as assistant secretary of the New Haven Car Register Company, was later made secretary and manager of the Recording Register and Fare Box Company, and for the last three years has been vice-president and manager of the New Haven Trolley Supply Company.

Railway Improvement Company, New York, N. Y., has received an order for Rico sanitary straps to be used on the new cars being built for the Northern Ohio Traction & Light Company by the St. Louis Car Company; also for Rico sanitary straps for the cars being built by the Cincinnati Car Company for the South Covington & Cincinnati Railway; for ten cars being built for the Wilmington & Philadelphia Traction Company by The J. G. Brill Company, and for 1540 new Rico No. 7 sanitary straps to be used on the cars of the United Railways & Electric Company, Baltimore, Md. The Rico No. 7 Railway Improvement Company's new strap is of bakelite composition. The company has also received an order from The J. G. Brill Company for anti-climbers to be used on the fifty cars being built for the Montreal Tramways.

ADVERTISING LITERATURE

Van Dorn Electric Tool Company, Cleveland, Ohio, is distributing circular No. 56 which describes external, aerial and bench types of electric grinding machines.

Peter A. Frasse & Company, Inc., Hartford, Conn., is distributing a folder on its oxy-acteylene process for repairing parts made of different metals.

Sangamo Electric Company, Springfield, Ill., has issued bulletin No. 45 which describes a mercury motor type of ampere hour meter.

Abrasive Company, Philadelphia, Pa., has issued catalog No. 6 describing a line of grinding wheels including those made from two special abrasives, Boro-Carbone and Electrolon.

Ingersoll-Rand Company, New York, N. Y., has issued catalogs No. 3037 and 3038 containing illustrations and descriptions of straight line and duplex types of dry vacuum pumps.

Automatic Ventilator Company, New York, N. Y., has issued a folder describing a new development in the form of the Flower brush holder for the slip ring side of rotary converters.

General Electric Company, Schenectady, N. Y., is distributing bulletin No. 44,001-K, which is a price-list on renewal parts and supplies for car equipment, mine locomotives and railway and mine line material.

Vanadian-Alloys Steel Company, Pittsburgh, Pa., has issued a folder describing three brands of carbon tool steel with data on the uses to which they may be put and the shapes in which they are supplied. A standard list of extras is included in the folder.

Boss Nut Company, Chicago, Ill., has issued a pamphlet on the "Boss Lock Nut and Its Home." In this pamphlet various stages of the manufacture of these nuts are shown, as well as its application to locomotive trailer trucks, passenger car draft rigging, railway frogs and to arch bar trucks.

Van Emburgh & Atterbury, New York, N. Y., have compiled a sixty-six-page book dealing with the finances of the Interborough-Consolidated Corporation, with especial reference to conditions when the new rapid transit lines shall have been completed. The book is divided into three sections, the first explaining the financial structure of the corporation, the second presenting pertinent financial statements of parent and subsidiary companies, and the third outlining the future. It is said that by 1921 there will probably be a balance sufficient to meet 6 per cent on Interborough-Consolidated preferred stock and provide a substantial sum for returns on the common stock of that company.

Electric Railway Journal

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THE RIGHT TO STRIKE DENIED

The whole tenor of the decision of the Supreme Court on the Adamson law is that the right of the public to continuous service of such a necessity as steam railroad transportation is paramount to the private interests of either employer or employee. If these two can agree upon terms of service and wages, well and good; if not, Congress either directly or through a commission can specify such conditions as it considers just, and its decision is binding on both employer and employee, provided it does not violate the constitutional safeguards against confiscation of property or other act of such arbitrary power as to amount to a denial of due process. As for the right of the employee to strike, the decision clearly says that whatever he might do in a private business, the right to leave work either individually or in concert with others is subject to limitation when a man accepts employment in a business charged with public interest and where the rates and wages paid are subject to the power of Congress. This seems entirely to dispose of the claim which has been made by labor leaders that any strike prevention legislation for public utilities would be unconstitutional because of the restriction of personal liberty. It is a fitting reminder to unionism that it is not to be considered as being above the law.

THE TRIAL YEAR OF THE SAFETY CODE

The year during which the national electrical safety code is being tried out, preliminary to its permanent establishment as an influential guide to regulatory bodies, is rapidly slipping away. The presumption is that the code is being carefully studied in its application to local conditions on individual electric railway properties. If this presumption is not correct it would seem to be wise to delegate to one or more individuals on each property the responsibility of making such a study now. A few months ago there was a great deal of activity in regard to the code. The Bureau of Standards certainly made a heroic effort to awaken interest in it. When first proposed the code was not taken seriously by the affected interests, as it did not seem possible that the work would assume such magnitude as developed later. In due time, however, they awakened to the necessity for co-operation in the preparation of the code, realizing that it was in a fair way to become established. There were meetings and conferences galore in the attempt reasonably to meet the ideas of the many interests involved and to conform the rules to the best existing practice. This stage is now past, and the rules have been published in tentative form as Bureau of Standards Circular No. 54. Copies can be had from the government printing office, Washington, D. C., at 40 cents each. They should be distributed freely throughout the electric railway industry. Elsewhere in this issue will be found a notice of the publication of a twenty-six-page synopsis of the code by the Wisconsin Railroad Commission. This will be of great value as a syllabus of the longer treatise.

PUBLISHING POLICY OF "AERA"

Another contribution to the discussion on *Aera*, begun in our issue of March 10, appears in our department of communications this week. It is from Frank R. Ford, who expresses the opinion that *Aera* in its present form is "too much of a magazine" for an association publication, and he recommends that its activities be restricted to those of a bulletin. The financial report of the association for the year ended Oct. 31, 1916, just issued, gives the present cost of the publication and emphasizes the point of Mr. Ford's remark. From less than $1,000 a month, the cost during the first fourteen months of its existence, the expense for publishing *Aera* has increased for the year ended Oct. 31, 1916, to $26,071, so that it is now more than $2,000 a month. At present it constitutes 22½ per cent of the total expenditures of the association and exceeds by a considerable amount any other single operating item. So far as we know, no hope is held out that the expense of the publication will become less in the early future; instead there are many reasons to believe that it will grow larger, if the present policy is continued. This question of increasing cost and value received therefrom should be considered in addition to the other points against the present plan already advanced by Messrs. Williams, Tripp and Mortimer.

COMPREHENSIVE IMPROVEMENTS IN DETROIT

The program of systematic improvement which is being carried out in Detroit, Mich., is typical of what in normal times will be going on to a greater or lesser degree on most of the progressive properties of the country. In spite of the fact that the Detroit United is operating without a franchise in the city the company is expending enormous sums of money in the endeavor to reduce operating expenses to the minimum. This involves, among other things, bringing repair and operating equipment strictly up to date in the best sense of that term. It so happens that Detroit has of late years been experiencing a decided boom. The expansion of the automobile and other industries has increased the pressure upon the transportation facilities and has furnished an unusual incentive for intensive development of the local railway system. Features of the development program have been mentioned from time to time in this paper. In order to give its readers a comprehensive idea of part of it the results of a study of the car yard, maintenance and inspection shop and yard office building improvements are printed in this issue. The new freight terminal and the main shop enlargement will also be taken up in due course. Seldom has a car-yard layout problem been attacked with more thoroughness than has the one whose solutions are outlined here. The minimizing of dead mileage, the liberal supply of yard trackage, the facilitating of handling cars into and out of storage with due regard to air charging necessary with the storage system used locally, and the provision of bright, airy and yet inexpensive buildings for washing, inspection and light repairs, and for the comfort and convenience of the men, all had careful attention. The work is progressing rapidly, and already enough is completed to demonstrate its effectiveness. In these times of comparative stagnation in electric railway construction it is encouraging to know that some of our railways at least are getting in fresh capital and that they are spending it, if not lavishly at least liberally.

AXLE-MOUNTED ARMATURES AND TRACK

A feature of particular interest was brought out at last week's convention of the American Railway Engineering Association in connection with a report, which is abstracted on another page, on the effect of electrification on maintenance cost of track. In this the definite statement is made that locomotives having a large proportion of their weight below the springs (obviously the type with axle-mounted armatures) require an increased strength of track, and that, although this increased strength means increased first cost, it ultimately tends to bring about decreased maintenance costs. This will no doubt come as a surprise to the majority of railway engineers, because there seems to have grown up a fairly well-defined idea that the axle-mounted armature pays a price—and a relatively large one—for its beautiful simplicity. Apparently, however, the price is not paid in the form of added costs in the maintenance of way, although it seems to be that closer attention to line and surface of track is required. Provided that this latter can be assured and the element of risk eliminated, a remarkably good case is made out for this type of locomotive drive. Its savings in power, because of its slightly higher efficiency than the geared drive, are more than sufficient to pay returns on the increased first cost entailed by the low armature speed, and there seems to be good evidence that the simplicity of the construction permits an appreciable decrease in the cost of locomotive maintenance, which when locomotive mileage is high runs into a lot of money at the end of the year. In brief, if the bogey of track maintenance cost is thus to be laid low, the axle-mounted armature should get a new lease of life, and it would be interesting if the American Railway Engineering Association's committee would elaborate its statements by publication of figures on which the opinion was based.

LESSONS OF THE WASHINGTON STRIKE

At this writing, March 21, the Washington Railway & Electric Company is operating 80 per cent service during the morning and evening rush hours and 100 per cent service or better during the midday hours. In fact, it is giving a service entirely adequate to handle traffic, which has been somewhat reduced by the non-riding of strike sympathizers. "Good for the Washington Railway; may it win out!" we can imagine our readers to be saying when they read this progress report. But while they are in the mood for congratulation, should not the electric railway managers of this country begin to ask themselves anxiously, "Who's next?"

The Washington strike is not over yet; and when it is the railway will have lost a great deal of money for the sake of maintaining faith with its loyal men and reasonable control of its business. In the meantime, it must make its fight alone against a nation-wide organization, with neither substantial nor spiritual aid from fellow managements.

In considering this strike it should be remembered that a year ago the company had already gone as far as it could in recognizing the principle of collective bargaining by making an agreement with its men as an independent body. But this did not satisfy the Amalgamated element. Instead of abiding by the spirit of the contract, it began a systematic boycotting and persecution of those who refused to join the union—exercising, in fact, an ostracism that extended to the wives and children of the recalcitrants. When the Amalgamated felt strong enough to stir up trouble publicly, war was declared on the company.

That electric railway employees should have the right to bargain co-operatively will not be denied, but that they should also have the privilege to shanghai into their ranks men who fail to appreciate the beauties of the Amalgamated system may seriously be questioned. Electric railway managers should know by this time that when they are dealing with the Amalgamated Association they are dealing with a shrewd, unscrupulous body which is conducting a strike somewhere pretty nearly every day in the year; which knows every trick and device for intimidating the timid and deceiving the sympathetic, and which has worked out almost to perfection among electric railway employees the policy of "Divide and conquer."

At present there are many and diverse opinions among electric railway managers as to the principles and methods of settling labor disputes. There is urgent need for getting together on these matters. It would be quite appropriate that a place be given to the subject on the American Association convention program this year, with ample allowance of time for discussion. The paper by Bentley W. Warren, presented at Boston last month, was very timely, but unfortunately was not discussed. Labor problems must be considered not as isolated, localized, sporadic occurrences, but as parts of a big economic situation. We do not know of any more important subject that is now before the industry for consideration.

DAYLIGHT SAVING AND THE ELECTRIC RAILWAY

We have referred once or twice in these columns to the daylight saving movement, which is likely to find favor here, perhaps in the coming season. Except for the pressure of business and filibustering in the Congress just closed, there was a fair chance that the bill for daylight saving which had been introduced might have pulled through. As it is, nothing can be done until Congress meets again, but if by that time we should be in a state of war, as seems probable, this among other measures supposed to tend to efficiency would stand a good chance of prompt adoption. There seems to be no organized opposition to it, the chief questions arising being concerned with details. The electric lighting industry has already discovered that no serious results to its revenues are likely to follow, but to the electric railway world it seems to us that the tangible results, if any, are likely to be rather beneficial than otherwise. Some of the effects have been previously alluded to, but others are worth mentioning.

In the first place there will be a certain tendency against a shift in the actual hours of activity whatever the clock may mendaciously proclaim. The mere instinctive tendency toward preserving the noon hour for labor at or near noon will tend toward change of the hours of labor to meet this requirement, and there will be many instances of a practical disregard of the new time in spite of its theoretical recognition. All this bears on the distribution of load throughout the day, tending somewhat to spread out the hours of dense traffic both in the morning and evening, a change not unwelcome to those suffering acutely from peak. The greatest difficulty with the urban railway business is the uniformity of hours of labor. When ten stories of people rush for accommodation in a one or two-story transit system and all insist on being carried at about the same time, the peak load becomes of a most uncomfortable character. Daylight saving might spread the hours of activity out a bit and bring a certain measure of relief on account of the diversity of transportation requirements of different lines of business, which would not all shift to the new schedule.

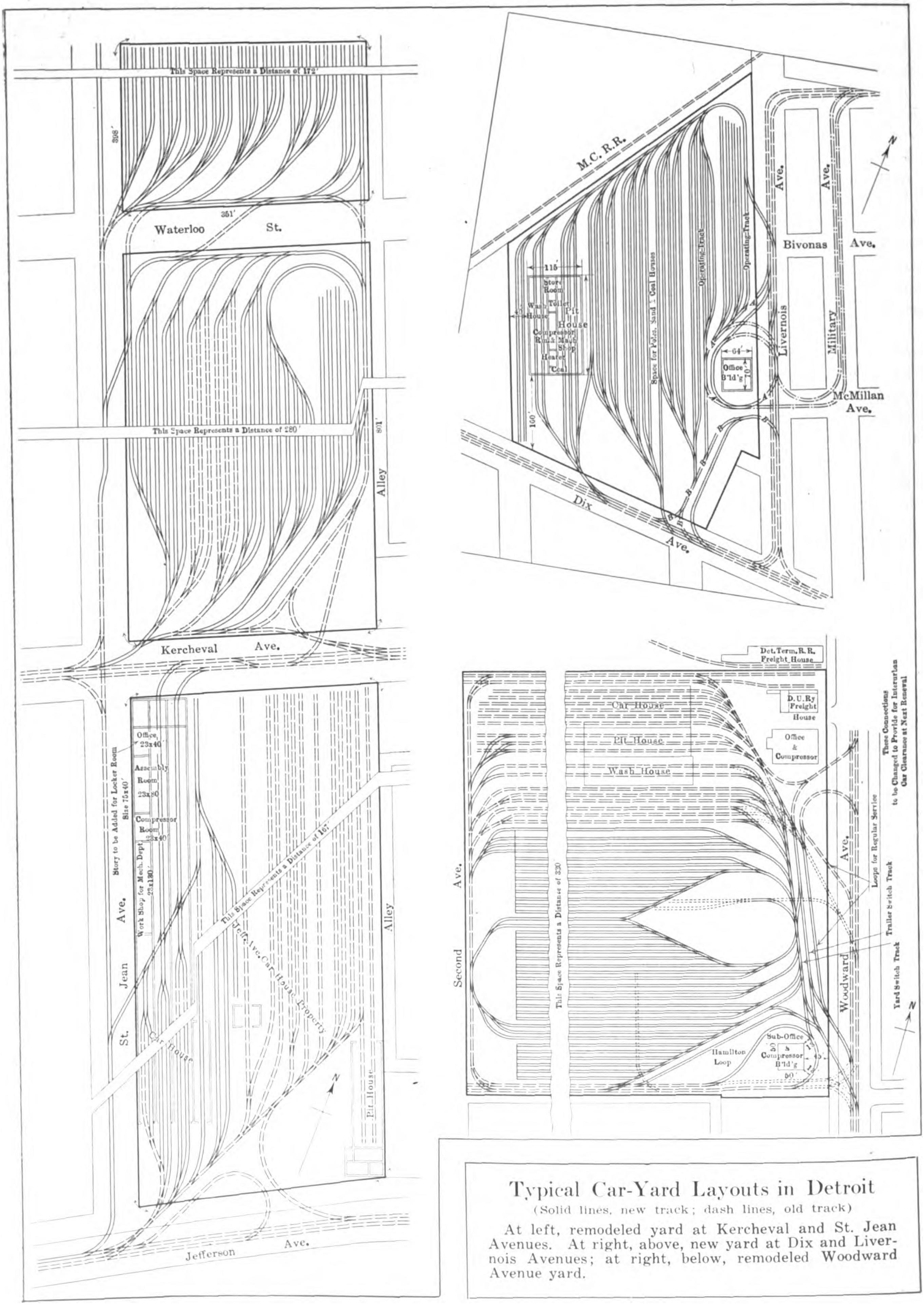
Aside from this the chief effect of daylight saving should be felt in the encouragement of pleasure riding. The most conspicuous part of the program is the apparent lengthening of the evenings, and this artificial prolongation of daylight will certainly encourage the freer use of parks and golf links all through suburban territory, as well as interurban riding in the outlying districts. The net result ought to be a very perceptible increase of traffic, as well as general improvement of the rush hour conditions. Whatever may be the result in general central station business, and we have no idea that it will be serious, the electric railways have nothing whatever to fear and some prospect of advantage. For this reason the electric railways can look with entire equanimity on the fateful night when the clocks may be shoved forward to remain there until the close of summer.

WHAT WOULD BE THE BANKERS' VIEW?

An explanation of the sometimes incomprehensible disinclination of railway companies to adopt standard designs may, perhaps, be found in the character of railway organizations generally. The difficulty is to some degree inherent, and it appears even more prominently on steam railroads than on electric lines. Its basis lies in the tendency of human nature (or, at least, of much human nature) to succumb to the fascination of fussing with details, and with the large and rather loosely-knit organizations that obtain in the transportation field, opportunity and authority are given to a good many officials to do such fussing without having to assume any responsibility for the final results in the broadest sense. It is doubtful whether any president or general manager or engineer of equipment or master mechanic really thinks that a slight change in the size of a gear fit, or the addition or reduction of a few inches in the length of a car, is going to make the difference between success and failure, but possibly all of these officials will have conceptions of certain details in design, and any one of them is generally able to put those conceptions across when new equipment is bought. No one of them assumes any direct responsibility for the economic result. Provided the equipment "works" there is no one to raise objections, and no one is interested in knowing whether or not such pet ideas as may have been introduced are bringing a return commensurate with their cost. In brief, there is, in the typical railway organization, no check upon the average official who wants the stamp of his individuality on the equipment that he assists in purchasing.

The most obvious and unfortunate example of the condition appears in the lack, until recently, of any great interest in a standard box car for steam railroads. Here the fact of interchange service makes even the fallacious "local conditions" argument an impossibility because equipment built for any road spends a large part of its time on other lines. Yet a new car's length and width are set in quarter-inches, and its metal fittings are cast or forged according to the ideas of some official whose beliefs may be revolutionized in a few years, even if he is not replaced earlier by someone else.

Exactly the equivalent of this is true of electric railways, although the results are not so marked because the organizations are smaller and the broad policies of practical economics do not have to be sifted through so many hands before reaching the active official who is supposed to apply them. Every railway man, for example, admits that standard cars would save 10 per cent in first cost, but the importance of the saving doesn't loom as large to him as it would if the money came out of his pocket instead of some banker's fund. Some day, perhaps, the bankers will find this out; then there will be a change. It will be hard to prove to the man who provides the cash for the equipment that minor differences in car lengths and other equipment dimensions are worth the thousands of dollars which they cost annually. Then, beyond a doubt, real standardization of equipment will begin.


This Space Represents a Distance of 172'
398'
351'
Waterloo St.
This Space Represents a Distance of 280'
801'
Alley
Kercheval Ave.
Office, 23x40'
Assembly Room 23x80
Compressor Room 23x40'
Work Shop for Mech. Dept. 23x180'
Story to be Added for Locker Room Size 75x40'
St. Jean Ave.
This Space Represents a Distance of 167'
Jeff. Ave. Car House Property
Car House
Pit House
Alley
N
Jefferson Ave.
M.C.R.R.
115'
Store Room
Wash House
Toilet
Pit House
Compressor Rm. & Mach. Shop
Heater
Coal
45'
160'
Space for Poles, Sand & Coal Houses
Operating Track
Operating Track
64'
70'
Office B'ld'g
A
B
Livernois Ave.
Military Ave.
Bivonas Ave.
McMillan Ave.
N
Dix Ave.
Det. Term. R. R. Freight House
D.U.Ry Freight House
Office & Compressor
Car House
Pit House
Wash House
Second Ave.
This Space Represents a Distance of 330'
Hamilton Loop
Sub-Office & Compressor B'ld'g
50'
45'
60'
Woodward Ave.
Loops for Regular Service
Trailer Switch Track
Yard Switch Track
These Connections to be Changed to Provide for Interurban Car Clearance at Next Renewal
N

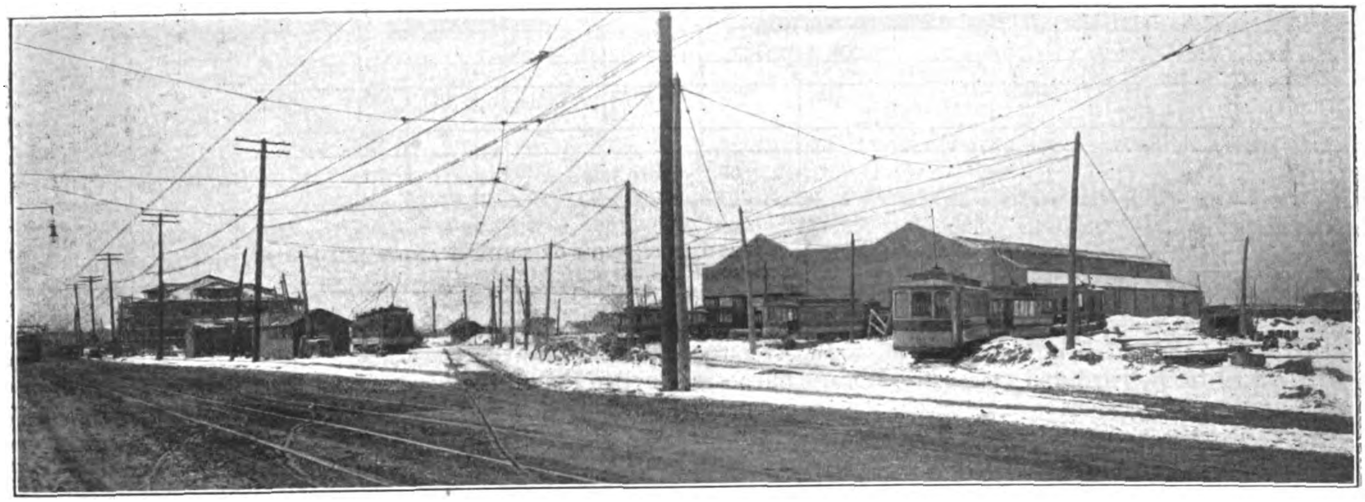
Typical Car-Yard Layouts in Detroit

(Solid lines, new track; dash lines, old track)

At left, remodeled yard at Kercheval and St. Jean Avenues. At right, above, new yard at Dix and Livernois Avenues; at right, below, remodeled Woodward Avenue yard.

Standardizing Car-Yard Layouts in Detroit

Detroit United Is Carrying Out Systematic Program of Car Yard and Carhouse Improvements to Facilitate Inspection and Handling Into and Out of Storage



DETROIT CAR YARDS—GENERAL VIEW OF WEST JEFFERSON YARD

IN its city system in Detroit the Detroit United Railway has a total of twelve carhouse locations with storage capacity in varying amounts. At the present time the whole system of storage yards and carhouse layouts is being remodeled with a view to standardization and consequent economy. In some cases existing facilities are being revised to meet present and future requirements, while in others the installations are entirely new. In the latter, of course, the most has been made of the opportunity to approach ideal conditions.

In all of this work the purpose has been to provide for rapid turning and air charging of cars in regular service, and efficient handling of trail cars (of which a limited number are used), in addition to securing economical use of space for storage purposes and providing adequate facilities for inspection, maintenance, repairs and washing.

In the process of this work there has been evolved a flexible standard general arrangement, one adaptable to site limitations and local service conditions. In general it involves a yard provided with numerous loops, a standard service building or carhouse costing about $50,000 complete, and an office and welfare building costing about $35,000. While it is impracticable to describe all of the construction in the city, sample illustrations have been selected to show how the local problems are being solved.

TYPICAL CAR-YARD LAYOUTS

One of the representative yards which is in process of remodeling is the Woodward Avenue yard represented in an accompanying illustration. In the drawing the solid lines represent the new track, the dash lines the original track which is to remain in place, and the dotted lines the track which is to be moved. In the drawing, to economize space, a 330-ft. section of the straight tracks has been represented by a blank space.

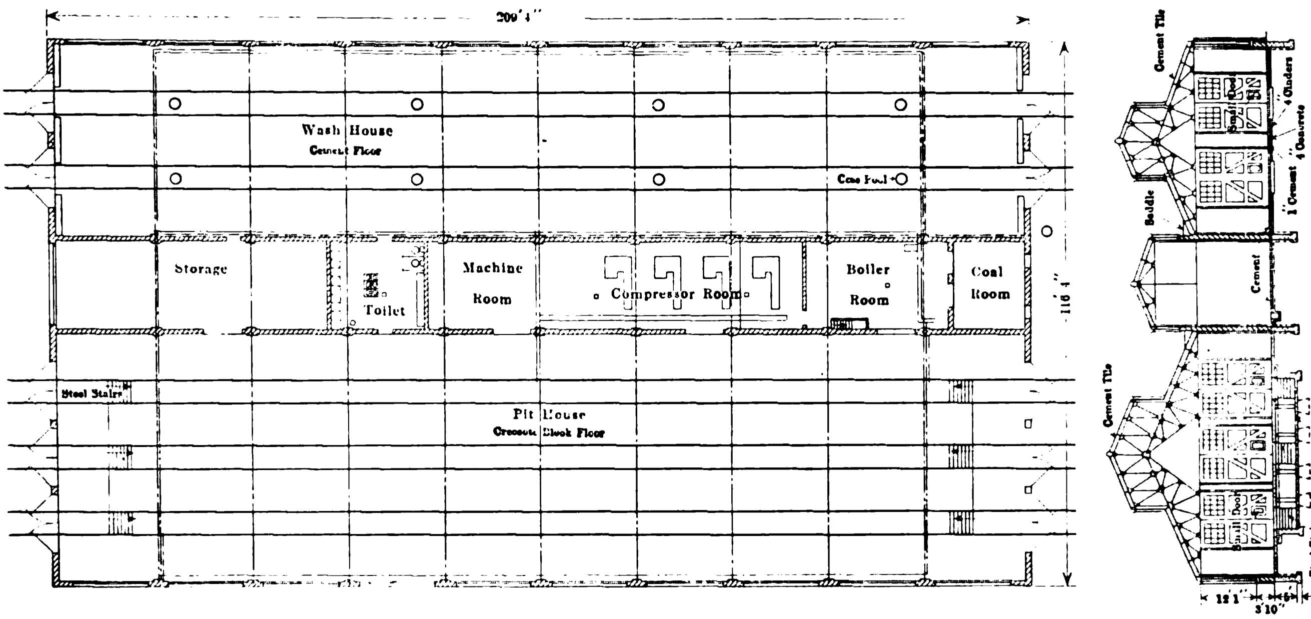
When this yard has been remodeled a loop will be furnished on the south side for the Hamilton Line cars which terminate at this point. A sub-office and compressor room for the service of this line will be constructed within the loop, as shown. As the storage air system is used on the Detroit lines, it will be understood that the accommodation of the compressors and facilities for charging the air tanks on the cars had to be considered in this as well as all of the other layouts. By charging when cars are at a terminal, the minute or less required for this purpose does not in any way interfere with the making of the schedule.

The loop used at present for turning Woodward Avenue cars will be increased as shown until it is sufficiently long to accommodate three two-car trains, all of which may be charged with air at the same time. Immediately back or west of the new loop the track for the handling of trailers will be installed. Entry to this track will be made at the north or south end of the property, and on it trailers will be picked up or dropped without interference with the regular service.

Next to the trailer track will be the switching track, connected with all the yard tracks, for the switching of cars from the yard to the inspection and wash-house building. All cars pulling into the yard will use the track on the south side of the property, heading west to Second Street, then north and into the tracks on which they are to be stored. All cars will be stored head-on toward Woodward Avenue.

The layouts as shown provide for thirty-eight additional tracks of an average length of 640 ft. and the yard will provide accommodation for 600 cars. There will be sixty-six switches and eighty frogs inside of the property lines, and six switches and nine frogs outside the lines. The minimum radius of curvature in the special work will be 40 ft.

Another remodeled yard, in which the same principles as those mentioned have been applied to a site of en-



DETROIT CAR YARDS—PLAN AND VERTICAL SECTION OF THE PIT AND WASH HOUSE AT THE WEST JEFFERSON YARD

tirely different character and quite a different original plan, is the yard at Kercheval and St. Jean Avenues. Here entry to the yard and tracks for storage purposes will in all cases be made by looping around the property with cars head-on to Kercheval Avenue. The service house for this yard will be south of Kercheval Avenue, an old storage building now used for the storage of summer and winter bodies being in process of conversion to accommodate this service. The ultimate capacity of this yard will be 300 cars.

Coming now to the entirely new propositions, the layouts at Dix and Livernois Avenues and at West Jefferson Avenue represent the application of the standard carhouse and office building plans to sites of different form without the hampering due to existing buildings and track. The same general provisions for air charging and trailer handling are made and, of course, the buildings are placed to the best possible advantage. Of these new yards the latter has been in operation for several months, and some photographs are reproduced to show its general appearance and that of the buildings. Some details of these buildings will be taken up later.

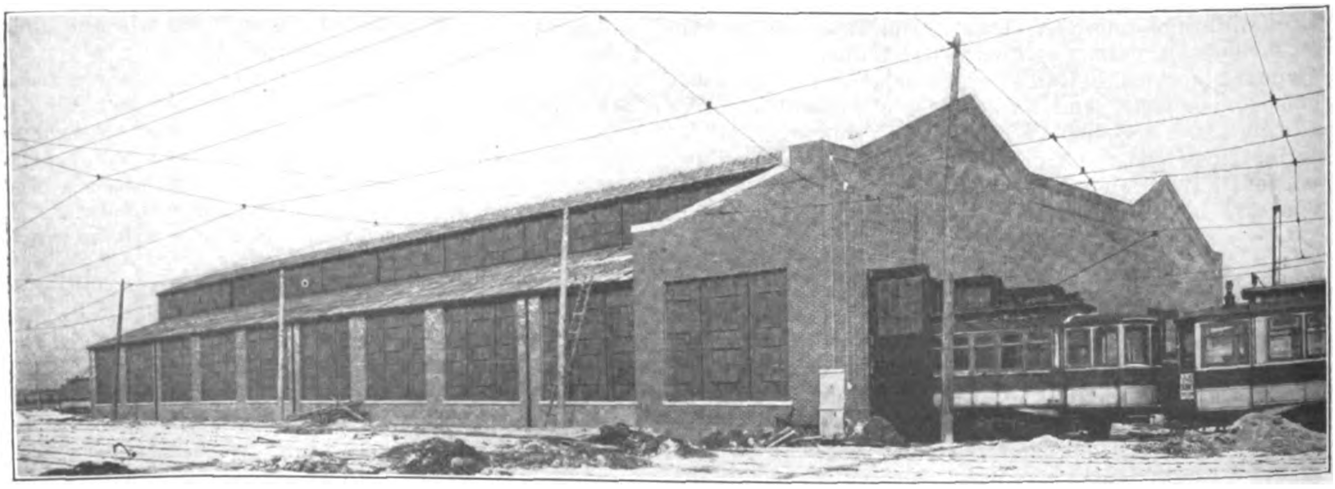
At Dix Avenue the office building is nearly complete and the center bay of the carhouse has been erected. This section was put up in advance of the remainder of the building to furnish heat for the office building and compressor service for the lines terminating at this point. The company expects during the coming spring to complete the wash-house and pit-house sections, but not to install the yard tracks for the present. However, early in the spring the loops marked *A* and *B* will be placed. This will afford a safe means for turning cars which are now required to wye at Dix and Livernois Avenues.

In these new plans it should be noted that the fundamental idea of looping around the carhouse property with head-on storage has been carried out.

A TYPICAL OFFICE BUILDING

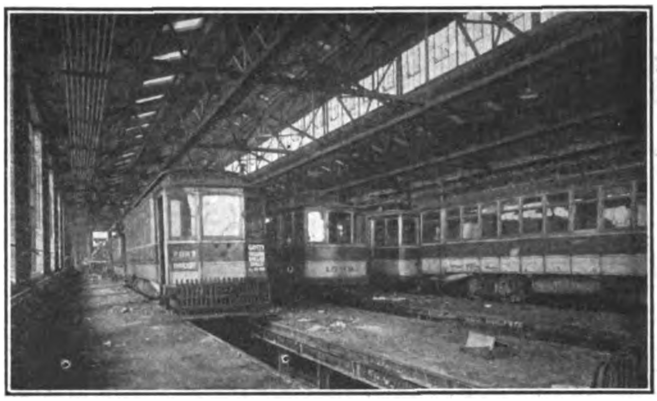
The office building at the West Jefferson yard is 60 ft. x 74 ft. in outside dimensions and contains two floors. The building is of steel, concrete and brick construction, the facing being vitrified brick with stone trimmings. It is roofed with red tile and presents a most attractive appearance. It is shown at the left in the photograph on page 535.

In the center on the first floor is a hall or assembly room about 29 ft. in width extending nearly the full depth of the building. On the side toward the left of the entrance are, from front to rear, a restaurant, 18 ft. x 28 ft. in size; a kitchen of the same width and 14 1/3 ft. deep; a storeroom of the same width and about 10½ ft. deep, and two toilet rooms, one entered from the storeroom and the other from the hall. The restau-



DETROIT CAR YARDS—PIT AND WASH HOUSE AT WEST JEFFERSON YARD

DETROIT CAR YARDS—OFFICE AND CARHOUSE AT KERCHEVAL AND ST. JEAN YARD



DETROIT CAR YARD—VIEW IN THE PIT HOUSE AT WEST JEFFERSON YARD

rant has a separate entrance from the front, and the kitchen one from the side. On the right of the entrance there are the following, from front to rear: A lobby opening on one side into the main hall and with a separate entrance on the side of the building opposite; a cashier's room, 18½ ft. wide x 12¼ ft. deep, with a counter on two sides, and with windows opening into the hall and into the lobby; a carhouse foreman's office of the same width and 34 1/3 ft. deep, with accommodations for his clerk and a counter with windows opening into the main hall. Opening from the carhouse foreman's office and at the back of the main hall is a small private office, 9½ ft. x 13 ft., for the division superintendent.

The public rooms on this floor are floored with terrazzo finish and the walls are plastered above tile wainscoting. At the back of the main hall broad stairs lead to the second floor, where are located the main toilet room, the dormitory accommodating forty men and a large locker room.

ception of doors opening into the toilet room and the storeroom.

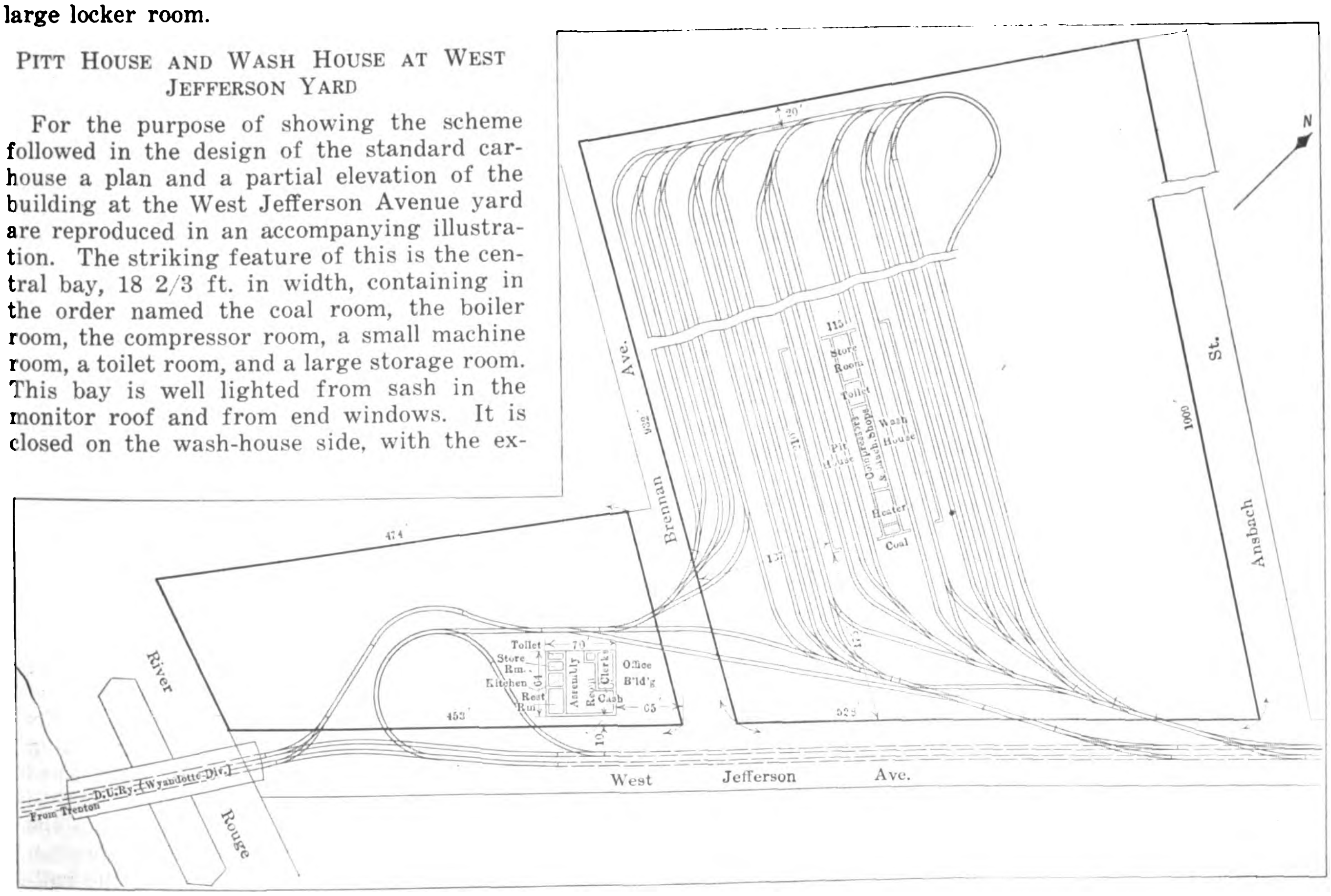
On one side of the central bay is the pit house with three tracks, providing space for twelve cars at one time for inspection and light repair. The wash house, with its two tracks, provides accommodations for eight cars.

This building has a light steel frame, brick walls with steel sash. The roofs are of the monitor type, with sash in the clerestory, and the roof is covered with cement tile. In the pit house the floor is of creosoted wood block laid on a concrete foundation, and in the wash house, storeroom and elsewhere there is a 1-in. cement floor laid on 4 in. of concrete.

At the top of this page is also shown a photograph of the office, assembly and shop building at one of the remodeled yards. A plan of this building, on a small scale, will be found in the drawing reproduced on page 534.

Pitt House and Wash House at West Jefferson Yard

For the purpose of showing the scheme followed in the design of the standard carhouse a plan and a partial elevation of the building at the West Jefferson Avenue yard are reproduced in an accompanying illustration. The striking feature of this is the central bay, 18 2/3 ft. in width, containing in the order named the coal room, the boiler room, the compressor room, a small machine room, a toilet room, and a large storage room. This bay is well lighted from sash in the monitor roof and from end windows. It is closed on the wash-house side, with the ex-



DETROIT CAR YARD—NEW YARD ON WEST JEFFERSON AVENUE—SEE OTHER ILLUSTRATIONS ON THIS AND PREVIOUS PAGES FOR DETAILS OF BUILDINGS

Results of Steam Railroad Electrification

At Annual Electrical Meeting of New York Railroad Club Electrical Engineers of Two Recently Electrified Roads Give Valuable Operating Data

THE New York Railroad Club held its annual "electrical night" on March 16. As is usual on electrical nights the attendance was very large, in spite of the threatened railroad strike which prevented the attendance of some members. E. B. Katté, chief engineer of electric traction New York Central Railroad, presided, and papers prepared by C. H. Quinn, chief electrical engineer Norfolk & Western Railway, and R. Beeuwkes, electrical engineer Chicago, Milwaukee & St. Paul Railway, were presented.

President L. E. Johnson of the Norfolk & Western had expected to describe the operating features of the electric division of that road, but he was prevented from doing so and Mr. Quinn delivered the paper in his stead. Mr. Quinn's paper is abstracted below. Mr. Beeuwkes prepared his paper and went to New York to deliver it but was called home on account of the labor situation. His paper was read by A. H. Armstrong, chairman electrification committee General Electric Company. The paper is abstracted elsewhere in this issue. Both papers were illustrated with lantern slides and moving picture films.

Replacement of Steam Locomotives in Electrification*

On the Norfolk & Western Railway More Than Four Mallet Engines Have Been Displaced by Each Electric Locomotive

BY C. H. QUINN
Chief Electrical Engineer Norfolk & Western Railway

ELECTRIC operation on the Norfolk & Western Railway was started on Jan. 1, 1914. With the introduction of the electric locomotive the increase in speed of tonnage trains from 7 m.p.h. to 14 m.p.h. up the grade, as well as the prompt handling of these trains through the Elkhorn Tunnel, had an immediate effect on the keying up of the entire traffic moved over this section of the line. With the exception of two through passenger trains, any of our electrically-handled coal trains can now keep out of the way of any steam movement in the same direction on the grade. The resulting elimination of delay incident to the necessary time to clear local passenger and time-freight trains represents a very considerable improvement over the time necessary to cover the same distance under steam operation. Further than this, the absence of delays incident to the taking on of coal and water for the three steam locomotives originally required on tonnage trains has not only materially reduced the running time but likewise has eliminated cause for delays to other trains usually found around main-line coal wharves and water plugs.

The inherent characteristics of the type of locomotive that is used on the Norfolk & Western Railway which permits us to maintain the constant speed of 14 m.p.h. up grade, as well as the same speed characteristics in regenerating and holding to a constant speed the trains moving down the grade, has enabled our telegraph operators, tower men and dispatchers to figure very closely on these tonnage movements. It is the daily practice to handle these trains directly ahead of local passenger and time freight trains, as the case may be, giving the tonnage train a five-minute margin with which to clear the passenger or time-freight train at the single-track tunnel at the summit of the grade. With a speed of 14 m.p.h. the electric locomotive will clear the tunnel in approximately three minutes. This comparatively short time element, coupled with the total absence of stalled trains and the reliability of the electric service in both directions, as compared with steam, has eliminated this single-track tunnel as a factor governing train movement. The tower operators that handle the movement through this tunnel figure the time on these tonnage trains after they strike the track indicators to within one or two minutes, and with this advance information and the certainty of the movement, they will permit an east-bound or west-bound train the right of track, without preference, through the tunnel, and yet can avoid any interruption to the movements in either direction.

The result directly brought about by the improvement in movement of coal tonnage trains on the Norfolk & Western electric zone has been primarily a very marked reduction in the time necessary for the crews to get over the road. Under steam operation, the average miles per day approximated 60 per locomotive. For the electric engines this mileage has been increased to 100, with comparatively slight increase in time in service per day for the engine crew. The short terminal time layover for our electric locomotives, which will average forty-five minutes per engine, permits us very closely to double-crew these engines every twenty-four hours. As a direct result of this increased mileage per engine crew, as well as the short terminal time allowed the electric locomotive, we have been enabled to reduce the number of locomotives handled out of Bluefield from seventeen steam engines to five electric locomotives. The number of pusher engines on the ruling grade has been reduced from a total of seven steam locomotives to two electric engines.

In view of this great increase in schedule speed it may be of interest to explain why the railroad company selected running speeds of 14 m.p.h. and 28 m.p.h. for the equipment. Briefly speaking, the location of a large part of the electric zone is through a comparatively narrow valley with resulting encroachments, on either side of the right-of-way, from buildings, coal tipples, coke ovens, and the property lines of the mining companies. Approximately 60 per cent of the trackage in this particular section is on curves, and there are fifty-four localities for switching movements from the main line. Thus it is imperative that all trains handled through this section should be under control. With shifting crews working in and out of the coal operations, where the movements require them to cross over and flag against traffic, and with the limited amount of passing siding and middle track that exists, it is virtually necessary that all slow freight trains operating in this section should be handled practically under yard board conditions.

Fourteen miles an hour, we believe, represents the maximum safe speed at which these heavy trains can be handled through this particular section of the railroad. In selecting this speed, we are enabled to double the rate at which the movements were made previously with the steam locomotive. At a constant speed of 14 m.p.h. the electric locomotive does not have any difficulty in keeping out of the way of local passenger trains, as well as time-freight trains, particularly when moving up the grade. The 28 m.p.h. operating speed, which is used when double-heading passenger trains, as well as when handling the freight tonnage over the lighter grades, has likewise proved very satisfactory. By way of explanation, I should further state that over this latter section of the road, the absence of mine operations and the comparatively few points where main line switching can take place, permits us to use a running speed of 28 m.p.h. for a 3250-ton train.

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*Abstract of a paper read before the New York Railroad Club, March 16, 1917.

With a fixed tonnage to be handled by these locomotives, the matter of horsepower developed per locomotive corresponds directly with the rate of speed in miles per hour. With a service requiring as much as 8000 hp. per train for the purpose of accelerating up to running speed and a continuous demand of 6000 hp. per train for operating at 14 m.p.h., it will necessitate the transmission of an equivalent amount of energy from the substation to the locomotive. With these requirements the running speed of 14 m.p.h. has worked out with great satisfaction, and even under 28 m.p.h. operation, with full load conditions imposed on these engines, the operation of the pantograph current-collecting system has been eminently satisfactory.

The following extract from the records of the train sheets, as well as the data collected from the car record office, will verify the wisdom of the railroad company in its decision to accept and install the electrical system now in use. The figures are taken from the operating sheets for the year 1914, which represented the last complete annual period of steam locomotive operation, and from the data covering the complete electric operation for the year ending Dec. 31, 1916:

	Steam 1914	Electricity 1916	Per Cent Change
Maximum east-bound tonnage for any twenty-four-hour day—gross tons	51,226	59,543	16
Maximum east-bound loaded cars for any twenty-four-hour day	675	757	12
Total east-bound loaded cars for year	132,618	165,689	22
Total east-bound ton-miles for year (millions)	467	592	27
Maximum number of locomotives required for heaviest day	43	9	*79
Total locomotive-hours required for year's business	93,625	44,112	*53
Normal number of locomotives in service	24	7	*71

*Decrease.

In this table note should be made of the great increase in traffic that was handled in 1916 as compared with 1914. Under the limited speed and track conditions previously referred to it is doubtful whether this volume of traffic could have been successfully handled with steam operation if only for one day of twenty-four hours. With nine electric locomotives as the maximum number that have been in service at one time and with an average of seven in use to handle the business as represented by the normal traffic in 1916, it is not difficult to understand whereby the capacity, without any increase in track facilities in this district of the Pocahontas division, may be considered to have been doubled, as compared with what we were able to do under our best steam operation.

In general, the cost of the electrification does not exceed, to any great degree, the value of such physical improvement to the roadbed and right-of-way as would have been necessary to put this division of the railroad in a position to handle the additional traffic with steam locomotives. The operating cost of the electric system is well within the original estimate. The production of energy in our steam power plant has more than passed our expectations. The ability of the electric locomotive to stand up under the heavy and exacting duties in pusher service, requiring the use of full power to hold the train slack while at a standstill, and to handle its rated tonnage according to the specifications under which they were purchased, is being demonstrated in every-day service. The present rating of engine, after being in use for two years, is identical with the figures quoted in the contract. The electric engine has more than met our expectations in the way of giving us more engine-miles per twenty-four hours than was expected. The operation of the electric transmission system, the substations and the overhead trolley wire, has been entirely successful. Consequently, the general operating improvement as described, coupled with the data which I have given, can only indicate that the electric locomotive service on this portion of the Pocahontas division has not only increased the capacity of the track at least 100 per cent, with a very conspicuous reduction in operating costs, but is likewise paying a return on the net cost of the installation. Putting this in different language, I feel that we can safely state that the installation is an engineering, an operating and a financial success.

As a further evidence of the value of this installation as a factor in the development of the railroad necessary to handle an increased volume of business, we have authorized, and have under construction, the electrification of an additional 11 miles of double-track main line, and 12 miles of branch line. The authority includes the purchase of additional locomotive equipment, as well as substation and power-house apparatus, to take care of the increased load requirements.

New Clearance Regulations Adopted by Illinois Commission

New clearance regulations have recently been issued by the State Public Utilities Commission of Illinois to supersede the former ruling as noted in the issue of the ELECTRIC RAILWAY JOURNAL for Aug. 7, 1915, page 228. The new rules relate to minimum clearances applicable to all new construction on railroads of the steam type, railroads of the electric type, and street railroads, but provide that no railroad shall be required to change existing track centers.

For street railroads the following provisions are among those included in the order: (1) Distance between centers of two main tracks shall give a clearance of not less than 2 ft. 6 in. between faces of cars; (2) distance between centers of main and subsidiary tracks shall give a clearance of not less than 3 ft. between faces of cars; (3) except where noted, subsidiary passenger tracks shall have centers spaced to give clearance of not less than 2 ft. between faces of cars; (4) lateral clearance at bridges between faces of cars and side of bridge shall be 2 ft. 6 in.; (5) lateral clearance between main track and adjoining buildings shall be not less than 2 ft. 6 in. to faces of cars; subsidiary tracks, 2 ft.; (6) distance between trolley poles and faces of cars shall be not less than 3 ft.; (7) building material or supplies shall be spaced not less than 3 ft. 6 in. from faces of cars on main tracks, 3 ft. on other tracks; (8) overhead clearances of electric circuits shall be as specified in the commission's General Order No. 30; (9) clearances are to be compensated for curves; (10) clearances stated are for cars of maximum width; (11) windows shall be equipped with bars or screens, and vestibule doors shall be kept closed when authority is given allowing clearances of less than 2 ft.

Operating Data on the Milwaukee*

The Author Submits Figures Covering Operation Under Steam and Under Electricity on the Electrified Divisions of the Chicago, Milwaukee & St. Paul Railway and Comments on the Experiences Obtained with the Locomotives and Power Distributing System

By R. BEEUWKES

Electrical Engineer Chicago, Milwaukee & St. Paul Railway

THE 440-mile electrified section of the Chicago, Milwaukee & St. Paul Railway is divided into two operating divisions, of which one has been in service long enough to permit the collection of reasonably reliable data regarding it. I may say, however, that on the other division we have been handling 3000-ton trains as a standard through the worst winter months and the entire operation is working out very successfully.

Although the figures for electric operation are very favorable, it should be remembered that they can hardly as yet be considered as final, because the steam figures represent the results of many years of effort and experience, while those for electricity are based on the use of apparatus that is entirely new in important respects, and on an operating experience of less than a year.

With regard to the operating organization, substation operating forces and line and locomotive maintenance forces have been added but, otherwise, no change, except in the way of reduction, has been made in the original steam organization and personnel. This includes the engineers and their helpers on the locomotives.

OPERATING EXPERIENCES

The change from steam to complete electric operation was made in the course of a few months with remarkable facility, its rapidity being governed entirely by the rate at which the manufacturer was able to supply the electric locomotives. The instruction of the engineers was done by having on the ground four or five General Electric men who had assisted in testing the locomotives at the works and who were thoroughly familiar with the electrical details. These men spent all their time for some months riding the different locomotives and explaining their electrical operation to the engineers, this being done on trains in regular operation.

Harlowton, Mont., is the Eastern terminus of the Rocky Mountain Division and the station where electric operation begins. Here are located the usual roundhouse facilities, a portion of which has been partly reconstructed to accommodate the electric locomotives. Three Forks separates the division into the East and West subdivisions and was a former steam engine division point. Deer Lodge is the western terminus of the Rocky Mountain Division.

With the introduction of electricity we were able to double what I may call the cruising radius of our locomotives. As far as the railroad is concerned we have eliminated Three Forks entirely. All locomotives run the entire 226 miles from Deer Lodge through to Harlowton, with only a very light inspection at Three Forks for bearings and pantographs. The shop and roundhouse are entirely closed down, seven or eight miles of tracks have been removed from the yard, and the comparatively large round house force previously employed has been replaced by a single electrician. All locomotives and cabooses are pooled, the men being given suitable locker space to store their lanterns, flags, tools, etc. Through-freight trains do not leave the main track and often are not switched at all. At Harlowton the engine is given a rough inspection and any light repairs made that are necessary. Detailed inspection and maintenance work is done at Deer Lodge.

The same change in operation has been effected on the Missoula Division, Avery to Deer Lodge; in this case Alberton being the steam engine division point eliminated.

Power consumption has been found on a typical day to vary from a maximum of 20,000 k.w., to a minimum of less than zero at times when regenerative braking is taking place to a sufficient extent to supply all the railroad system demands and actually return some power to the power company's supply system. How much this is we cannot tell as the curve-drawing meters do not register negative kilowatts.

Under the present conditions, we are running with a monthly load factor—ratio average load to maximum load—of about 40 per cent, but expect within a few months to have installed a so-called power-indicating-and-limiting system, which will automatically indicate to the dispatcher the exact amount of power which the whole system is drawing at any instant and will automatically within certain limits hold the maximum down to a certain, predetermined amount. This has the object of keeping as low as possible the maximum amount of power which we have to contract with the power company to furnish us.

CAUSES OF TRAIN DELAYS

A comparison of passenger train delays for the Rocky Mountain Division for October, November and December under steam operation for 1915 and electric operation in 1916 indicates the comparative reliability of service under the two systems. The passenger service consists regularly of two through, heavy, steel, eight-car trains each way per day and one three-car local each way between Butte and Harlowton. In this connection it should be borne in mind that the schedule time of the through trains under electricity was reduced forty minutes from that under steam, and that during the months of electric operation the amount of freight business done was for one month 40 per cent and for three months 29 per cent greater than the corresponding months of steam operation, a circumstance which renders the electrical showing all the more favorable. The number of trains run under steam and electricity, respectively, is practically the same.

The records show a great decrease in operating delays. This indicates, among other things, that the dispatcher, as has been found to be the case, is better able, under electric operation to plan and predict train movements. This may be accounted for on the basis of less varying speed, lower number of trains for a given business (that is, freight trains), and fewer trains delayed. In any event, in these three corresponding months steam passenger trains waited for the right of way 1910 minutes as against 254 minutes for electric trains.

Delays on account of extra-heavy trains were only one-ninth as great under electricity as under steam. Our electric engines will handle ten or eleven steel cars on the 2 per cent Piedmont grade very comfortably.

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*Abstract of an address made before the New York Railroad Club, March 16, 1917

In speaking of bad weather conditions in our electrified territory we generally have in mind extremely low temperature, sometimes 50 deg. below zero in places for days at a stretch, or the heavy snows which occur in the Bitter Root Mountains. It might have been expected that such low temperatures would result in many trolley and transmission troubles due to contraction of wires and cables, but the construction is particularly suited to such conditions and we now have but little trouble on account of them. The records for the three months in question show 445 minutes delay to passenger steam engines, and none to electric engines, this bearing in mind that many of the trains during the cold weather had to be run double-headed. We have never, under any conditions, required the use of more than one electric engine on any passenger train.

Electric engine failures have caused more delay than steam engine failures. We have had more trouble with electric motor bearings than we expect to have ultimately as there has been some difficulty in obtaining proper lubricant and the packers have had to acquire new experience in handling the high speed bearings involved. In connection with the electric engines, much delay has been due to difficulties with the flash boiler and parts used for train heating. A great deal of experimental work has been and is still being done on this apparatus, which is the only portion of the locomotives not as yet entirely successful. However, on account of regenerative braking there has been a marked reduction in waits to repair brake rigging and change shoes.

Of the electrical troubles, exclusive of those on the locomotive, most are due to the pantograph in some way fouling the overhead construction either because of the trolley wires or the track getting out of alignment or one track rail being low. Failure of power, either on trolley or transmission side of sub-stations, except for the interval required to throw in an automatically opened circuit breaker, is practically negligible. The minutes of delay attributable to the electric system, outside of the locomotives, amount to about 8 per cent.

In this connection it might be stated that the best organization of maintenance forces and means of transporting these forces to the location of troubles has not yet been determined upon, and the percentage of delays due to trolley troubles is therefore considerably higher than we ultimately expect it to be. Also the troubles themselves should diminish, as not only were our poles set in all kinds of weather conditions, but also much new rail was laid and ballasting done during the process of electrification and it will take some time before the poles and track get finally settled into permanent position.

The total minutes of delay is about the same for the two systems, but the number of trains delayed is reduced about 40 per cent under electricity. Of the trains delayed under electricity about 85 per cent were delayed about the same length of time as the average steam train was delayed, the remaining 15 per cent suffered considerable delay mainly on account of accidents and derailments to other classes of trains. About the same number of trains ran in schedule time under steam and electricity while the number of trains making up time increased about 60 per cent and the time made up about 150 per cent under electricity.

Delays due to electrical features of the locomotives are comparatively slight, a rather surprising and gratifying fact considering the number of new features, such as the use of 3000-volt direct current and direct-current regeneration, which are incorporated in the locomotive and, further, considering that only a year ago the engineers operating these locomotives were all driving steam engines. I may add that the double trolley wire construction as used by us has proved very successful, absolutely sparkless collection of current being obtained under all conditions of speed and amount of current. Twenty-six per cent of the total minutes of delay was attributable to the electric system as a whole.

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY DATA ON OPERATION UNDER STEAM LAST THREE MONTHS IN 1915 AND UNDER ELECTRICITY LAST THREE MONTHS IN 1916
Rocky Mountain Division

Passenger Service	Steam	Electricity
1—Train or train engine-miles	119,330	119,237
2—Helper engine-miles	24,752	.....
3—Number engines	13	7
4—Train-miles per engine	9,190	17,040
5—1000 kw.-hr. at power company's meters	.....	34.785
6—Kilowatt-hours per train mile	.....	29.1
7—Coal, total tons	11,260	.....
8—Coal, pounds per train-mile	188	.....
Freight Service		
9—1000 ton-miles	282,862	364.087
10—Train-miles	176,937	186,010
11—Helper engine-miles	56,363	20,157
12—Number engines	43	15
13—1000 ton-miles per engine	6,745	24,260
14—*Number trains	792	855
15—Ton-miles per train-mile	1.600	1,960
16—Total time, hours	17,825	14,535
17—Minutes per 1000 ton-miles	3.78	2.39
18—1000 kw.-hr. at power company's meters	.....	14,343
19—Kilowatt-hours per 1000 ton-miles	.....	39.4
20—Total tons coal	39,050	.....
21—Pounds coal per 1000 ton-miles	276	.....

*Trains over entire division of 226 miles.

LOCOMOTIVE PERFORMANCE

The accompanying table shows for the Rocky Mountain Division a comparison of locomotive performance for October, November and December, under steam operation in 1915 and electric operation in 1916. It should be understood that the figures, while sufficiently correct for comparative purposes as they are taken from the same report forms, are not to be considered as strictly accurate when considered individually. The forms are those from which the data could most conveniently be obtained in the short time available.

The figures of item 3 give the number of engines actually assigned to passenger service, both on the road and in shops, by the District Master Mechanic. The electric engines include five double units and two split locomotives. The number can probably be reduced when train heating apparatus is gotten into shape and minor electrical improvements completed, which matters have required more shopping than will ultimately be necessary. The number of steam engines, on the other hand, is a minimum, as freight engines in helper service were often used to help passenger trains, a fact which is not taken into account in the figures shown. Therefore, less than half as many electric as steam engines are required for the passenger service.

The item 4, train-miles per engine, is derived from the preceding figures and, on basis of what has just been mentioned, the figures are high for steam and low for electricity. Our record for an electric engine is 9052 miles made in June, 1916.

Item 5, or thousands of kilowatt-hours recorded at power companies meters, shows the actual electric energy purchased and chargeable against this service. Every electric engine is equipped with a kilowatt-hour meter, which on each trip is read at points of commencement of motoring and again at commencement of regeneration, giving a record of the engineer's performance as regards use of power. The figures shown in the table are the net energy read as the locomotive increased by a suitable amount for line and substation losses. The efficiency of the system from the power company's meters to the locomotives is running now between 67 per cent and 70 per cent.

For freight operation item 9 shows an average increase in ton-miles during the months of electric operation of 28.8 per cent over that of steam. For the month of November the increase was 40 per cent. In this connection the superintendent of the division has said that to handle the 1916 business either electrification or double tracking would have been necessary. The latter would still, of course, have required extra motive power. Possibly, the superintendent did not intend his statement should be taken literally, but, in any event, it is reasonable to assume that under the business conditions which existed during the electrical months, and the resulting congestion, the given figures would be, for steam, too favorable.

The figures of item 11 show that for the same ton-miles there would be over three times as many helper engine miles under steam as under electricity. No account is here taken of the return trips of helpers or their otherwise running light. This is a considerable item under steam, but is small for electricity.

Item 12 shows a number of engines that is possibly a little high for steam on account of some of these engines being at times used in passenger helper service. The number of electric engines given is the number purchased for this service and considered sufficient. We are, unfortunately, obliged to use only our judgment in this matter, as many of the locomotives purchased for the Missoula Division, not then under electrical operation, were available and used. Twenty-eight locomotives are now easily handling business for the two divisions.

Using the figres as they stand and deducing from them item 13—1000 ton-miles per engine—we find that the electric engine handles about three and one-half times as many ton-miles per month as the steam engine. From item 17, or minutes per 1000 ton-miles, it appears that the electric engine cuts 30 per cent from the time to do a given business, partly by faster running and partly by heavier trains.

Item 14 shows that there were an average daily number of trains involved of 8.6 for steam and 9.3 for electricity.

Item 15, ton miles per train-mile, is about the same as tons per train, and is 22 per cent greater for electricity than steam. The electric train, it might be considered at first glance, ought by comparison to be heavier, but it should be remembered that the steam train has two locomotives during a considerable part of the time. The tonnage of through-freight trains is greater than is indicated, the average figures shown being considerably reduced on account of the comparatively light local freights that are included.

Items 18 and 19, showing consumption of electric energy are derived in the same manner as previously described for passenger service. In conjunction with items 20 and 21 they give a comparison of relative amounts of coal and electricity used to handle a given business. Under present conditions we are paying for our electricity on a kilowatt-hour basis and it is costing considerably less than coal did.

As to the effects of regeneration on the power consumption, this varies more or less, but for the month of November, the amount of regenerated power measured at the locomotives was 11.3 per cent of the total power consumed at the motors. Tests on a 2 per cent grade with a passenger train have shown a return as high as 42.8 per cent of the consumption at the motors. Some of this power goes over the trolley direct to locomotives which are motoring, and the rest goes through the substations, reversing the motor generators and either flowing into the power company's transmission system or along the railway company's line to other substations. The power saving feature of regeneration, however, is not considered so important as the increased safety and ease with which trains are handled on the heavy mountain grades and the saving in wear and tear on brake shoes and equipment.

Wisconsin Association Holds Annual Meeting

Papers on Fair Return on Investment and on One-Man Car Operation of Interest to the Railway Field

THE ninth annual meeting of the Wisconsin Electrical Association held at the Pfister Hotel, Milwaukee, on March 14 and 15 and presided over by President W. E. Haseltine, general manager Ripon Light & Water Company, was occupied principally with subjects of primary interest to the electric lighting properties of the State. Two papers were presented, however, of particular interest to electric railway men, one by Mr. Erickson on "What Constitutes a Fair Return on Utility Investment?" and one by Mr. Smith on "The One-Man Car," which was read by J. P. Pulliam, Oshkosh, in the author's absence. The paper by Mr. Smith was published in the JOURNAL last week. That by Mr. Erickson will appear in a later issue.

FAIR RETURN ON UTILITY INVESTMENTS

R. B. Brown, Milwaukee, in discussing Mr. Erickson's paper, said that the financing of future extensions and replacements was the greatest problem before the utilities of the country and one which was becoming steadily greater. Investors were formerly willing to buy securities on the strength of the immediate return expected, but they now demanded to know not only the present status but great detail of the past earnings and future prospects of the company. This makes it practically essential to have surplus earnings so that any unforeseen contingency may be overcome or discounted by using this surplus to pay the dividends during a lean year. He said the public utility operators should see to it that the public knows more about this financing problem of the utilities.

In answer to a question as to what were the elements which go to make up a fair rate of return, Mr. Erickson replied that for rate making purposes, this included the cost new of the property, plus the going value, plus the necessary working capital. He said that depreciation was looked upon by many as a form of amortization and could therefore be deducted from the cost new when computing the investment upon which fair return should be expected. This, of course, was wrong, as a depreciation reserve is not made for that purpose and could not be so considered unless it was turned over to the investors. If a depreciation fund were turned over to the investors, then there would later be no funds available for replacements as equipment wore out. Taking a hypothetical case, Mr. Erickson said that if a 20 per cent depreciation reserve were deducted from the cost new, and the fair return was based on this investment, then the interest received would be a fair return on 20 per cent less than the capital invested, which would in reality be a confiscation of property.

Dean Treat, La Crosse, read some discussion on Mr. Smith's paper prepared by R. M. Howard, Winona. Mr. Howard said he had found a singularly unanimity of opinion among railway men as to the advantages of the one-man car. After three years' operation of these cars in Winona, he said that they had not developed any new classes of accidents and that the concentration of responsibility had had a tendency to lessen accidents. All his cars were equipped with air brakes, and he believed this had been of importance because of the advantage it gave the motormen in coping with the carelessness of automobile drivers, who were responsible for 60 per cent of the accidents. The betterment of service possible by using one-man cars through the improved schedule and reduction of accidents, he thought, warranted the investment and upkeep of this type of equipment. This type of car is an advance in the electric railway business and he believed the railway men were guilty of failure to impress this fact on their patrons. This was especially true, taking into account their duty to produce a ride at the lowest possible cost consistent with good service. There are few properties, he said, where one-man car operation could not be used to a greater or lesser degree with a consequent reduction in average cost of transportation per passenger. He believed that if all cars were equipped to operate nearside, pay-as-you-enter, front-platform, that a host of conductors could be put at more effective work.

Mr. Treat added some discussion to what he had read and said that one of the disadvantages of one-man car operation was that it required a lower schedule speed than with two men, since 9 m.p.h. was about as fast as could be made, whereas it was possible to have a schedule speed of 11 m.p.h., or a 20 per cent. increase with two men. While 50 per cent of the platform expense per car was saved, this necessitated the slowing up of speed as the volume of business increased, and he was afraid that this was a very serious step to take, and one which should be very carefully considered.

Mr. Pulliam remarked that the first impression gained by the general public of the one-man car was that it was going to put one man out of a job for every car operated, and that this was looked upon with disfavor. He said that during the major portion of the day, at least ten or twelve hours out of the twenty-four, the traffic in the majority of cities could be very easily handled by one-man cars. An estimate of what this type of equipment installed completely in Oshkosh would mean had been made, and it was estimated that the saving in labor alone would amount to very nearly $12,000 a month, using one-man cars on all lines during the major portion of the day.

W. J. Brooks, Westinghouse Electric & Manufacturing Company, called attention to the effort which has been made to eliminate the use of the name "one-man car" for this type of equipment, as it was believed that the trouble which had been experienced in its introduction had been induced by this name. His company had been endeavoring to substitute the name "safety car" as a better cognomen. He said that the physical nature of a city had a great deal to do with the savings possible with this type of car. It had not been designed with the idea that it could be used to decrease the operating cost for any railway company very much, but that it would permit a company to give more service and a better headway at the same cost.

W. H. Beattys, Westinghouse Traction Brake Company, reviewed some of the safety features of the newer type of cars designed to operate with only one man and made reference to the very great success with which these cars have met in Fort Worth, Tex. He also remarked that the manager of one property in a town of over 200,000 population, who had visited Fort Worth and studied the operation of one-man cars there, was seriously considering a large installation of them on his property. His plan included the use of conductors on the cars through a congested zone in the center of the city, using only one man over the remainder of each run. This would make it possible for one conductor to handle several cars.

OTHER SUBJECTS DISCUSSED

J. N. Cadby of the Wisconsin Railroad Commission engineering staff reviewed briefly the proposed national electrical safety code and pointed out the principal items requiring the consideration of the electrical company operators. He explained the twenty-six-page booklet of rules which the commission had made up based almost entirely on the Bureau of Standards code, and which gave the gist of this voluminous work. This booklet was prepared with a view to reducing the code to essentials and to give a more readily comprehensible set of rules for the consideration of the electrical men at a hearing on the proposed code before the commission on March 16, the day following the association meeting.

C. W. McIver, Jr., Eau Claire, Wis., prepared a paper on "Transmission Problems," which in the author's absence was read by A. E. Pierce, general manager Wisconsin-Minnesota Light & Power Company. This dealt with the problems and costs of giving the small towns the privilege of electric service and maintaining the investment and rate on a basis profitable to the company. He showed that the ratio of earnings to operating expense, not including interest and depreciation, for ten small towns was 22 per cent.

Among the points brought out in the discussion of this paper was the manner of securing contracts with unincorporated villages. The experience recited showed that in a few cases such villages had been induced to incorporate; that the town board had in a few instances, where there was only one village in the township, signed the contract; and that in other cases a committee of the local merchants had bonded themselves to stand good for the payment of bills within the village. In one instance before service was granted, the company had insisted on all-night, every-night street lighting service, and a certain minimum use of current per capita per month.

B. F. Lyons, Beloit, chairman of the committee on associations, made a report to the association favorable to an affiliation with the National Electric Light Association as a geographic section. This affiliation would not affect the railway members of the association in any way, except to benefit them indirectly as the result of the enlarged income of the association by virtue of such affiliation. The report was referred to the executive committee for action.

A. C. Babson, Watertown, chairman of the committee on rural service, summed up the progress made over the State in supplying electric lighting service to farmers. This showed a slight increase in the amount of this class of service, and gave evidence to show that it was a profitable class of business in the State because of the $2 to $3 minimum charge maintained.

C. D. SeCheverell, chairman of the committee on taxation, made a report which was approved by the association, thus putting it on record as indorsing the State tax board and instructing its legislative committee to endeavor to get a bill passed by the State Legislature which would bring the assessments of the electric light and gas companies, as well as the electric railways, under the State board. The street railways of the State are at present assessed by the State board and have a better rate than the other utilities which are assessed by local tax assessors. It is desired to bring all these utilities under the one State board and eliminate the discrimination.

NEW OFFICERS

The following officers of the Wisconsin Association were elected for the current year: President, B. F. Lyons, vice-president and general manager Beloit Water, Gas & Electric Company; first vice-president, A. E. Pierce, vice-president and general manager Wisconsin-Minnesota Light & Power Company, Eau Claire; second vice-president, John St. John, secretary and treasurer Madison Gas & Electric Company; third vice-president, F. B. Ludden, president and manager Mineral Point Public Service Company; secretary-treasurer, George Allison, comptroller Clement C. Smith Properties, Milwaukee.

B. R. T. Issues Efficiency Pamphlets

Weekly Departmental Bulletins Are Being Distributed to Employees for Daily Reference— H. A. Bullock Discusses the New Standard Courtesy Code for Platform Men

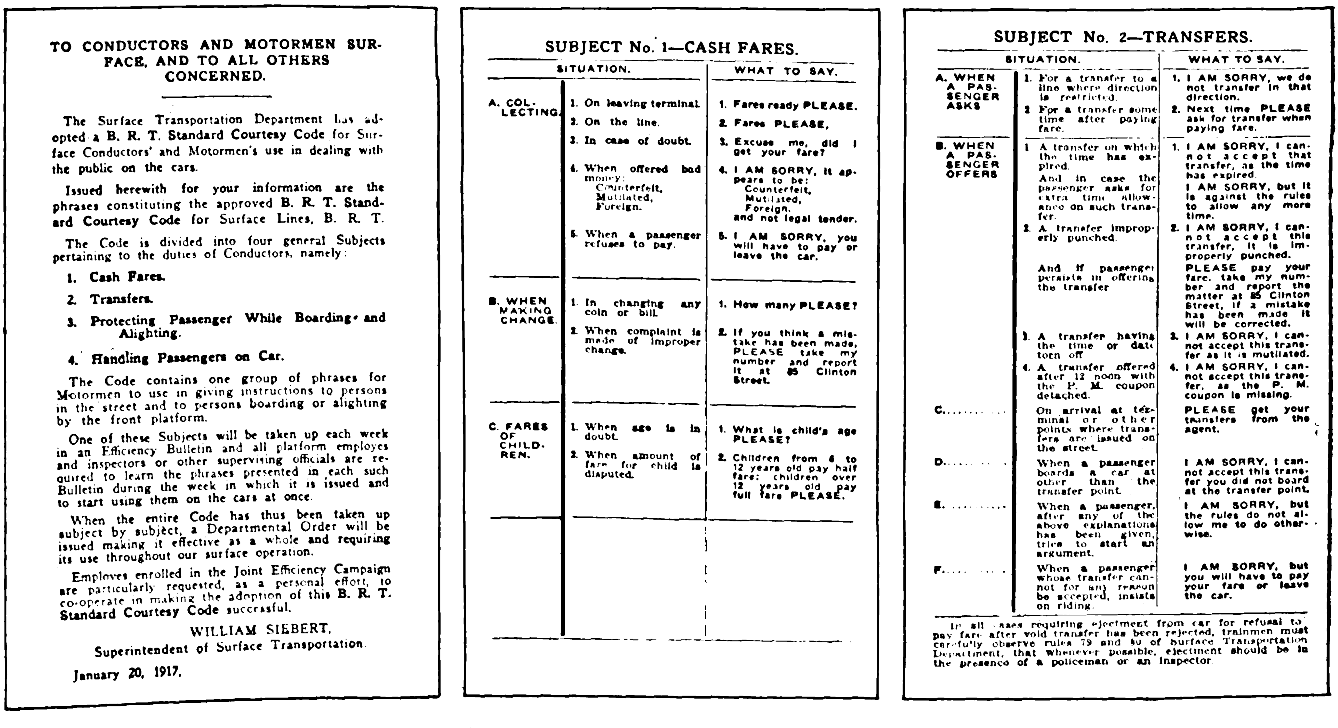
THE joint efficiency campaign of the Brooklyn (N. Y.) Rapid Transit System, inaugurated Dec. 1, 1916, the plan of which was announced in the issues of the ELECTRIC RAILWAY JOURNAL for Jan. 13, 20 and 27, is now well under way. A number of weekly departmental bulletins, some of the title pages of which are herewith reproduced, have already been distributed among the employees of the surface transportation, mechanical and way and structure departments. In these bulletins the elements of personal efficiency are clearly set forth, and stress is laid upon these elements which are more or less directly related to the net earnings of the whole enterprise.

An encouraging and very helpful interest has been shown by employees in all departments where the efficiency campaign is under way, as is indicated by the fact that in the surface transportation department about 4900 out of 5200 conductors and motormen enrolled in the campaign by signing the enlistment blank. Participation in the campaign is conditional only upon the understanding that each bulletin shall be read once each day during the week following its date of issue. This feature was adopted, first, for the purpose of pledging a participant to one definite act in the interest of efficiency every day, and, second, for the purpose of getting a more thorough reading of the educational material.

STANDARD CODE OF COURTESY

Of all the bulletins and the practices they recommend those explaining the new standard courtesy code of phrases for motormen and conductors in dealing with the public, reproduced herewith, have, perhaps, attracted the widest public attention. According to a statement made by Harry A. Bullock of the railway company to a representative of this paper, the announcement of the code was not received without a certain amount of raillery at first on the part of the Brooklyn newspapers. For example, one newspaper published a remark made by a conductor to one of its reporters that "You can't make an actor out of a conductor," in answer to the question as to what he thought of the B. R. T. code. The statement referred to a suggestion in a code bulletin, that if it was worth while for a minister or actor to consider the pitch of his voice so as to be pleasantly understood, it was doubly worth while for a street railway man to do so, as he has to speak to more people in a day than a minister or actor talks to in a week. In an ensuing bulletin the railway company retaliated with the observation that one might also say that it wasn't possible to make a trapeze performer out of a structural iron worker; but that wouldn't change the truth of the proposition that freedom from dizziness and a good balance, which are necessary for the trapeze performer working only a few feet from the ground, are far more necessary for the iron worker who has to work hundreds of feet in the air. In the same way, explains the bulletin, it is even more necessary for a street railway conductor to make himself easily understood in speaking to several thousand people every day on matters involving their safety as well as their convenience, than it is for the actor who speaks to a few hundred every night, or the minister who speaks to a thousand or two once a week.

Humorous heckling by certain newspapers, such as that quoted above, induced some of the platform men to regard the new code in rather a light vein at first, but this skepticism is wearing off and has been mitigated by the appearance of editorials in the Brooklyn *Times*, *Standard Union* and *Eagle* warmly commending the



TO CONDUCTORS AND MOTORMEN SURFACE, AND TO ALL OTHERS CONCERNED.

The Surface Transportation Department has adopted a **B. R. T. Standard Courtesy Code** for Surface Conductors' and Motormen's use in dealing with the public on the cars.

Issued herewith for your information are the phrases constituting the approved **B. R. T. Standard Courtesy Code** for Surface Lines, B. R. T.

The Code is divided into four general Subjects pertaining to the duties of Conductors, namely:

1. **Cash Fares.**
2. **Transfers.**
3. **Protecting Passenger While Boarding and Alighting.**
4. **Handling Passengers on Car.**

The Code contains one group of phrases for Motormen to use in giving instructions to persons in the street and to persons boarding or alighting by the front platform.

One of these Subjects will be taken up each week in an Efficiency Bulletin and all platform employes and inspectors or other supervising officials are required to learn the phrases presented in each such Bulletin during the week in which it is issued and to start using them on the cars at once.

When the entire Code has thus been taken up subject by subject, a Departmental Order will be issued making it effective as a whole and requiring its use throughout our surface operation.

Employes enrolled in the Joint Efficiency Campaign are particularly requested, as a personal effort, to co-operate in making the adoption of this **B. R. T. Standard Courtesy Code** successful.

WILLIAM SIEBERT,
Superintendent of Surface Transportation.

January 20, 1917.

SUBJECT No. 1—CASH FARES.

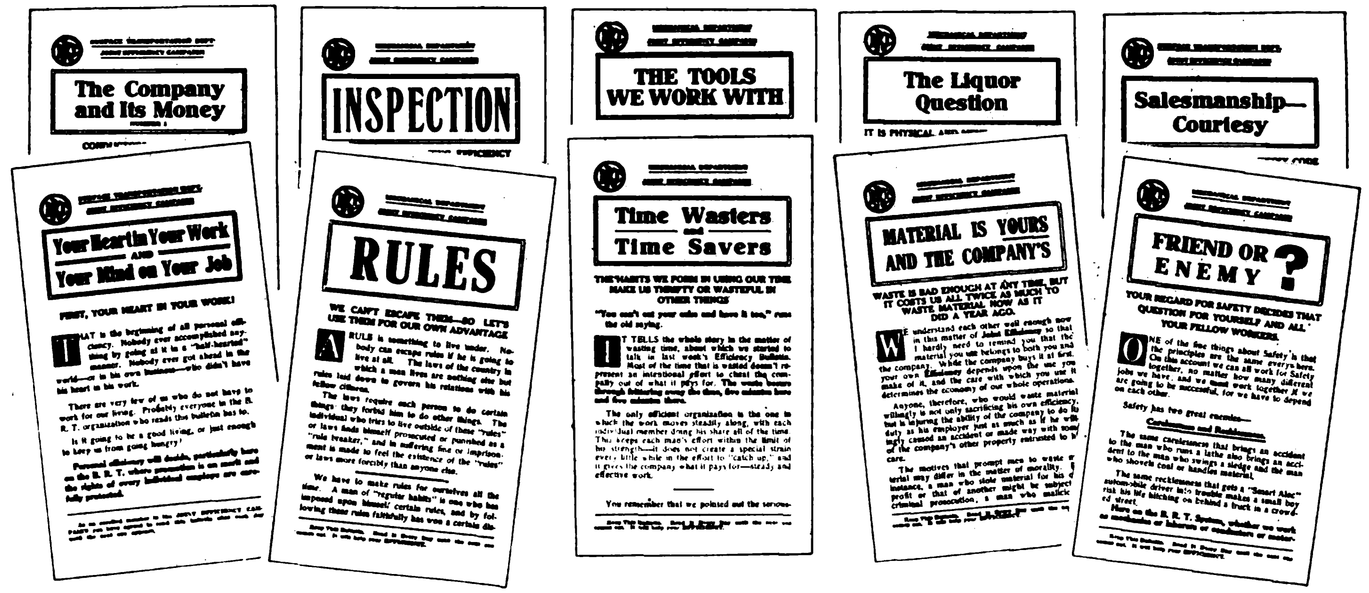
SITUATION.		WHAT TO SAY.
A. COLLECTING.	1. On leaving terminal.	1. Fares ready PLEASE.
	2. On the line.	2. Fares PLEASE,
	3. In case of doubt.	3. Excuse me, did I get your fare?
	4. When offered bad money: Counterfeit, Mutilated, Foreign.	4. I AM SORRY, it appears to be: Counterfeit, Mutilated, Foreign, and not legal tender.
	5. When a passenger refuses to pay.	5. I AM SORRY, you will have to pay or leave the car.
B. WHEN MAKING CHANGE.	1. In changing any coin or bill.	1. How many PLEASE?
	2. When complaint is made of improper change.	2. If you think a mistake has been made, PLEASE take my number and report it at 85 Clinton Street.
C. FARES OF CHILDREN.	1. When age is in doubt.	1. What is child's age PLEASE?
	2. When amount of fare for child is disputed.	2. Children from 6 to 12 years old pay half fare: children over 12 years old pay full fare PLEASE.

SUBJECT No. 2—TRANSFERS.

SITUATION.		WHAT TO SAY.
A. WHEN A PASSENGER ASKS	1. For a transfer to a line where direction is restricted.	1. I AM SORRY, we do not transfer in that direction.
	2. For a transfer some time after paying fare.	2. Next time PLEASE ask for transfer when paying fare.
B. WHEN A PASSENGER OFFERS	1. A transfer on which the time has expired.	1. I AM SORRY, I cannot accept that transfer, as the time has expired.
	And in case the passenger asks for extra time allowance on such transfer.	I AM SORRY, but it is against the rules to allow any more time.
	2. A transfer improperly punched.	2. I AM SORRY, I cannot accept this transfer, it is improperly punched.
	And if passenger persists in offering the transfer	PLEASE pay your fare, take my number and report the matter at 85 Clinton Street, if a mistake has been made it will be corrected.
	3. A transfer having the time or date torn off	3. I AM SORRY, I cannot accept this transfer as it is mutilated.
	4. A transfer offered after 12 noon with the P. M. coupon detached.	4. I AM SORRY, I cannot accept this transfer, as the P. M. coupon is missing.
C..........	On arrival at terminal or other points where transfers are issued on the street.	PLEASE get your transfers from the agent.
D..........	When a passenger boards a car at other than the transfer point.	I AM SORRY, I cannot accept this transfer you did not board at the transfer point.
E..........	When a passenger, after any of the above explanations has been given, tries to start an argument.	I AM SORRY, but the rules do not allow me to do otherwise.
F..........	When a passenger whose transfer cannot for any reason be accepted, insists on riding.	I AM SORRY, but you will have to pay your fare or leave the car.

In all cases requiring ejectment from car for refusal to pay fare after void transfer has been rejected, trainmen must carefully observe rules 79 and 80 of Surface Transportation Department, that whenever possible, ejectment should be in the presence of a policeman or an inspector.

SECTIONS OF B. R. T. STANDARD COURTESY CODE


The Company and Its Money

INSPECTION

THE TOOLS WE WORK WITH

The Liquor Question

Salesmanship—Courtesy

Your Heart in Your Work and Your Mind on Your Job

FIRST, YOUR HEART IN YOUR WORK!

RULES

WE CAN'T ESCAPE THEM—SO LET'S USE THEM FOR OUR OWN ADVANTAGE

Time Wasters and Time Savers

THE HABITS WE FORM IN USING OUR TIME MAKE US THRIFTY OR WASTEFUL IN OTHER THINGS

MATERIAL IS YOURS AND THE COMPANY'S

WASTE IS BAD ENOUGH AT ANY TIME, BUT IT COSTS US ALL TWICE AS MUCH TO WASTE MATERIAL NOW AS IT DID A YEAR AGO.

FRIEND OR ENEMY ?

YOUR REGARD FOR SAFETY DECIDES THAT QUESTION FOR YOURSELF AND ALL YOUR FELLOW WORKERS

TYPICAL B. R. T. DEPARTMENTAL BULLETINS NOW BEING ISSUED WEEKLY IN JOINT EFFICIENCY CAMPAIGN

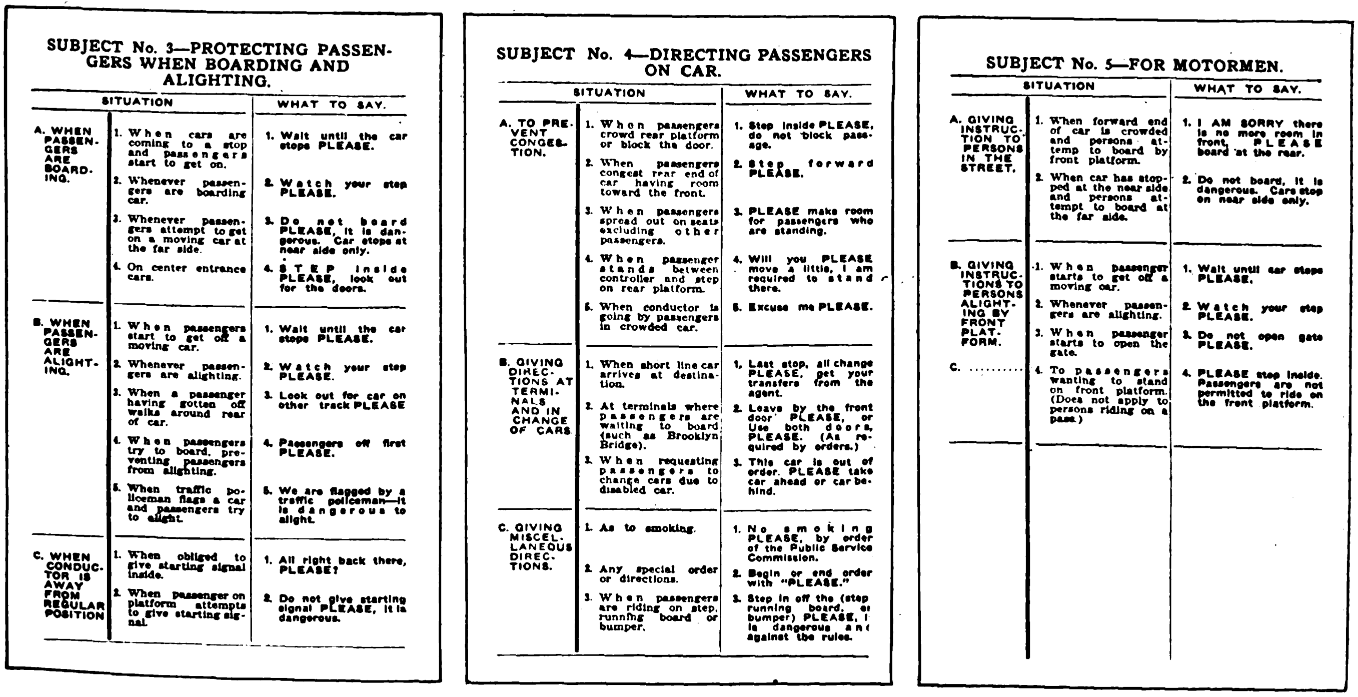
courtesy campaign. These editorials were subsequently reproduced by the railway company in a pamphlet, 150,000 copies of which were distributed to the public. It will doubtless be difficult for the older employees to adopt the new code, and allowance will be made in their behalf if it is found that they are successful in handling passengers ably and courteously in their own accustomed way. It is believed, however, that the training of new men in the usage of the code will gradually convince their seniors of the effectiveness of this uniform system.

"THE WAGES OF THEFT"

A striking appeal to the honesty of the conductor is contained in one bulletin entitled, "The Company and Its Money—The Wages of Theft—What Does It Pay?" As a typical answer to this question the folder quotes a letter from a former B. R. T. conductor to the superintendent of surface transportation, stating that the writer had been unable to obtain employment as patrolman in the police department because he could not get a satisfactory reference from the railway company. Examination of the company's past correspondence revealed the laconic reply which it had been obliged to make to the police department's inquiry about the ex-conductor:

> Dear Sir:
>
> In reply to your inquiry of the 14th inst. concerning one B...... B......, beg to advise that we had a man of that name in our employ whose record follows:
>
> 1—31—04, appointed conductor.
> 3— 7—09, discharged.
>
> Yours truly,
> Brooklyn Rapid Transit System.
> Transportation Department, Record Branch.
>
> Unsatisfactory service.

The company will be obliged to send a similar reply when B—— B——'s name is reached on the eligible list of the New York Post Office, where the ex-conductor is being offered temporary employment. Upon looking up B—— B——'s record as conductor it was found that he got seventy-one warnings in four years from his depot superintendent for being reported for "shorts" in collecting fares, and that twice before his final dismissal he was recommended for discharge and was given "another chance."



SUBJECT No. 3—PROTECTING PASSENGERS WHEN BOARDING AND ALIGHTING.

SITUATION		WHAT TO SAY.
A. WHEN PASSENGERS ARE BOARDING.	1. When cars are coming to a stop and passengers start to get on.	1. Wait until the car stops PLEASE.
	2. Whenever passengers are boarding car.	2. Watch your step PLEASE.
	3. Whenever passengers attempt to get on a moving car at the far side.	3. Do not board PLEASE, it is dangerous. Car stops at near side only.
	4. On center entrance cars.	4. STEP inside PLEASE, look out for the doors.
B. WHEN PASSENGERS ARE ALIGHTING.	1. When passengers start to get off a moving car.	1. Wait until the car stops PLEASE.
	2. Whenever passengers are alighting.	2. Watch your step PLEASE.
	3. When a passenger having gotten off walks around rear of car.	3. Look out for car on other track PLEASE
	4. When passengers try to board, preventing passengers from alighting.	4. Passengers off first PLEASE.
	5. When traffic policeman flags a car and passengers try to alight.	5. We are flagged by a traffic policeman—it is dangerous to alight.
C. WHEN CONDUCTOR IS AWAY FROM REGULAR POSITION	1. When obliged to give starting signal inside.	1. All right back there, PLEASE?
	2. When passenger on platform attempts to give starting signal.	2. Do not give starting signal PLEASE, it is dangerous.

SUBJECT No. 4—DIRECTING PASSENGERS ON CAR.

SITUATION		WHAT TO SAY.
A. TO PREVENT CONGESTION.	1. When passengers crowd rear platform or block the door.	1. Step inside PLEASE, do not block passage.
	2. When passengers congest rear end of car having room toward the front.	2. Step forward PLEASE.
	3. When passengers spread out on seats excluding other passengers.	3. PLEASE make room for passengers who are standing.
	4. When passenger stands between controller and step on rear platform.	4. Will you PLEASE move a little, I am required to stand there.
	5. When conductor is going by passengers in crowded car.	5. Excuse me PLEASE.
B. GIVING DIRECTIONS AT TERMINALS AND IN CHANGE OF CARS	1. When short line car arrives at destination.	1. Last stop, all change PLEASE, get your transfers from the agent.
	2. At terminals where passengers are waiting to board (such as Brooklyn Bridge).	2. Leave by the front door PLEASE, or Use both doors, PLEASE. (As required by orders.)
	3. When requesting passengers to change cars due to disabled car.	3. This car is out of order. PLEASE take car ahead or car behind.
C. GIVING MISCELLANEOUS DIRECTIONS.	1. As to smoking.	1. No smoking PLEASE, by order of the Public Service Commission.
	2. Any special order or directions.	2. Begin or end order with "PLEASE."
	3. When passengers are riding on step, running board or bumper.	3. Step in off the (step running board, or bumper) PLEASE, it is dangerous and against the rules.

SUBJECT No. 5—FOR MOTORMEN.

SITUATION		WHAT TO SAY.
A. GIVING INSTRUCTION TO PERSONS IN THE STREET.	1. When forward end of car is crowded and persons attemp to board by front platform.	1. I AM SORRY there is no more room in front, PLEASE board at the rear.
	2. When car has stopped at the near side and persons attempt to board at the far side.	2. Do not board, it is dangerous. Cars stop on near side only.
B. GIVING INSTRUCTIONS TO PERSONS ALIGHTING BY FRONT PLATFORM.	1. When passenger starts to get off a moving car.	1. Wait until car stops PLEASE.
	2. Whenever passengers are alighting.	2. Watch your step PLEASE.
	3. When passenger starts to open the gate.	3. Do not open gate PLEASE.
C.	4. To passengers wanting to stand on front platform. (Does not apply to persons riding on a pass.)	4. PLEASE step inside. Passengers are not permitted to ride on the front platform.

SECTIONS OF B. R. T. STANDARD COURTESY CODE

American Railway Engineering Association's Convention

At the Meeting Held in Chicago During the Past Week Reports Were Presented by Committees on Electricity, Rail, Track, Ballast, Ties and Other Subjects Relating to the Equipment of the Right-of-Way of Steam Railroads

THE eighteenth annual convention of the American Railway Engineering Association was held in the Congress Hotel, Chicago, Ill., from March 20 to March 23, 1917, with a fourth day at the conclusion of the technical sessions that was devoted to an inspection trip along the south shore of Lake Michigan to Gary, Ind. A number of the reports submitted by the committees, although they dealt primarily with steam railroad matters, possessed special interest for the electric railway industry, and abstracts of these are published in the following paragraphs. In addition to the standing committee reports an extended preliminary statement from the American Committee on Electrolysis was presented, through the three members of the association that served on it. This statement, which is abstracted on page 549, had the character of a preliminary report and it dealt with the exposition of such facts regarding the subject of electrolysis as the committee could agree upon, a further, formal report embodying conclusions and recommendations being planned for a later date.

RELATIVE COST OF TRACK MAINTENANCE ON ELECTRIFIED ROADS

The major part of the report of the standing committee on electricity was devoted to the subject of maintenance of permanent equipment on electrified railroads, the material presented being summarized from the answers to a circular sent to eighteen railroad companies that had electrified track. In connection with railway power distribution systems generally, the report stated that the tendency in the past eight years for long-haul traffic has been the use of the high-voltage system with an overhead wire for transmission of the propulsion current. However, all roads that have installed third-rail for this purpose have extended the use of the third-rail wherever extensions of electrified territory have been made.

Regardless of the type of the power distributing system, the introduction of electric traction has not necessitated any radical changes in the organization of the maintenance forces for the permanent structures. The maintenance of the power stations, substations and transmission systems has usually been placed under the supervision of the motive power department or of an electrical department organized especially for the purpose, while the maintenance of the working conductors, positive and negative cables, track bonding, etc., has naturally been placed under the maintenance of way department. The maintenance of the electrified track is, in general, performed as far as possible by the existing maintenance of way organization, with such additions thereto as the particular conditions on each railroad may demand. No material change in the length of track sections nor in the force employed has been required.

The presence of a third-rail results in noticeable precautions being taken by employees walking and working thereon. Ultimately the precautions become a habit. With the third-rail system a reduction of efficiency has been produced both through fear of injury and through the physical obstruction. With the overhead system there is no physical obstruction nor danger opposed to the free movement of employees on the track, but these elements are transferred to employees working on top of cars and at stations and bridges.

The existence of a third-rail has increased the cost of renewing ties and relaying running rail by at least 15 per cent, and for ballasting by at least 10 per cent. The work of lining and surfacing track has been handicapped by the presence of the third-rail, but on the other hand the presence of convenient power close to the track has permitted the use of power-driven machines for much work formerly done by hand, as well as the use of portable electric lights and electric track heaters for melting snow at switches.

With the overhead system it is practically impossible to afford sufficient clearance at all points, and on two railroads all wires of less than 21 ft. 6 in. clearance are designated by illuminated signs. On another road warning of low clearance is given by bamboo poles extending horizontally over the track and supported by a hinged device which is attached to the poles supporting the contact wiring and which permits lateral upward movement. The life of the bamboo is considerably shortened by the blows that it receives from passing pantographs.

Opinion is that the rail wear from flanges, on curves where multiple-unit equipment is used, is greater than with steam equipment. This increased wear is estimated in one case to be 25 per cent. Corrugation of the rail with multiple-unit equipment is a noticeable detail, tending to shorten the rail life. The fact that trucks of multiple-unit cars are generally heavier than those of corresponding equipment in steam operation is believed to be the cause of this corrugation, which occurs during acceleration and retardation of the trains. On the other hand, with electric locomotives, as opposed to motor cars, the rail wear is believed to be no greater than with steam locomotives of equal weight and wheelbase.

Nevertheless, electric locomotives with axle-mounted armatures require the maintenance of line and surface of track in better condition than steam equipment. Axle-mounted armatures necessitate also the design of the locomotive so as to restrict its lateral movements, which otherwise might become of sufficient magnitude to injure or displace the track. These features, where they obtain, have brought about the strengthening of the details of spikes and tie plates. This has added to the cost of track construction, but it tends to reduce the cost of track maintenance.

No appreciable effect from the introduction of electric traction is observed upon the first cost or maintenance of frogs, switches, crossings and other special appliances. In general, the usual increase in traffic density, coincident with the introduction of electric traction, renders it difficult to segregate the increased cost of maintenance due to the change in the type of rolling equipment. For high-speed service, however, it is believed that there has been a decided decrease in the cost of track maintenance. Also, on electrical installations there is a decided advantage because of the elimination of corrosion from the locomotive gases, and because of the absence of cinders and ashes, the freedom from fires and the more cleanly condition of the ballast.

TESTS ON RAIL AND RAIL JOINTS

The committee on rail presented an elaborate report beginning with the statement that the average number of failures per 100 track-miles of rail rolled for several years, including both Bessemer and open-hearth, had been showing a steady decrease. Of rail that had been five years in service, that which was rolled in the year 1908 had been responsible for 398 failures per 100 track-miles; that rolled in 1909, 278 failures, and that rolled in 1910, 198 failures.

A paper on tests of rail joints presented as a part of this report gave a study of the effects on the strength and rigidity of rail joints resulting from various percentages of carbon in untreated and in quenched angle bars, and also as affected by the use of oil-quenched, minimum-carbon steel track bolts versus untreated, low-carbon steel track bolts. The tests indicate that the strength of the metal varies with the carbon content when other elements are constant and when the metal is handled in the same manner for both treatment and quenching. They indicate also that proper quenching of the metal raises both the yield point and the ultimate strength of the steel, and that the strength and rigidity of the joint is greater with oil-quenched minimum-carbon steel bolts than with untreated, low-carbon steel bolts.

Another paper was devoted to the subject of tests of rail by the quick-bend method, this giving the results of an investigation ordered by the rail committee of the Pennsylvania Railroad in 1915. The object of the investigation was to develop a substitute for the present drop test for rails which did not appear to give consistent results in that the deflection and number of blows required to break the heavier rail of modern type did not correspond with those which would normally be expected from the same height and weight of tup with an increased span. The quick-bend tests were made in a hydraulic forging press equipped to permit taking of indicator cards of the pressure and corresponding deflection, and they gave more consistent results than the drop tests. The principal advantages of this type of test are that data regarding the elasticity of the steel are obtainable, and it is possible more definitely to determine the ductility because a more detailed study can be made of the relations existing between the deflection and load at points between the elastic limit and the ultimate load. On the other hand, the quick-bend test is probably not as good for brittleness as the drop test. However, the committee in conjunction with the manufacturers' rail committee has taken under consideration the quick-bend test as a substitute for the drop test for rail.

SIGNS, FENCES AND CROSSINGS

The committee on signs, fences and crossings stated that it had not been able to find a style of surfacing for highway crossings that could be universally used, particularly one that would conform to the paving in the streets adjacent to the crossing. It has been quite fully demonstrated that a concrete base under and between the ties has not proved to be satisfactory because it is too rigid at first and because it frequently fails after being subjected for a time to the severe pounding of heavy rolling stock. With regard to current practice in flangeways the committee stated that an extraordinary diversity of practice obtained throughout the country, the width and depth ranging on steam railroad tracks from 1¾ in. x 1¾ in. up to 2 in. x 2½ in., and on a number of electric railways ranging from 1⅛ in. x ¾ in. up to 2¾ in. x 2½ in.

With regard to signs the committee stated that railroads generally have too many permanent indications along their rights-of-way. The use of wood signs with elaborate inscriptions should be discouraged on account of the cost of repainting and renewal. Metal signs that consist of an old boiler-tube post set in concrete with an iron or steel plate of proper size riveted to it are growing in popularity. When this is painted white with black letters and border it produces a neat and durable sign.

To eliminate the expense of repainting signs it was suggested that the contour of the signboard without lettering could serve for the guidance of trainmen. This would eliminate a large item in the maintenance expense as well as in the first cost. The nearest approach to eliminating the cost of lettering on signs appears on the Canadian Pacific Railway, which makes use of iron plates of various sizes with the letters and figures punched out, allowing daylight to take the place of paint. The cost of such signs, according to a paper on the subject that was printed as an appendix to the report, ranged from one-half to four-fifths of the cost of a painted sign made of wood.

With regard to fencing the committee submitted a statement describing experiences with a concrete post to which the woven wire was attached by staples driven into composition in the center of the post. After four years of service of the most severe type this fence was found to be in good condition. Data were also submitted in regard to some concrete posts that displayed an average loss by breakage of only about 0.6 per cent per year, the first cost being approximately $300 per mile of fence as against $380 per mile of fence equipped with steel posts.

With regard to steel fence posts, the committee stated that the most complete information it had been able to obtain was a report from T. E. Rust, chief engineer Waterloo, Cedar Falls & Northern Railway, who had experimented on a large scale with both steel and concrete fence posts. He had had much better success with the steel post than with the concrete post, because the latter was subject to a considerable amount of breakage. Steel posts installed in the summer of the year 1911 had recently been lifted out of the ground to determine the condition of the lower portions, and were invariably found to be in excellent shape. This road's latest type of fence has line posts of No. 16 gage, galvanized steel, with a length of 7 ft. for use in soft ground and 6½ ft. for ordinary conditions, the fence height being 4½ ft. The end and corner posts are made of 10 gage and are 8 ft. long. The posts are 20 ft. apart on tangents and 16½ ft. apart on curves. Line posts are driven and corner posts set in concrete.

Experience was cited also in connection with galvanized-steel posts which had been in service since the year 1902. In addition the committee submitted a complete abstract of laws relating to the provision of right-of-way fences and the installation of stock-guards in the various States of the Union.

Attention was called in the report to an investigation that is now being made on grade crossings by a committee of the American Railway Association in connection with the National Association of Railroad Commissioners. This will cover five specific practices that will be recommended for adoption by public service commissions and other authorities, as follows: (1) Uniform approach warnings; (2) uniform color or light for night indication; (3) uniform use of a circular disk about 16-in. in diameter with the word "Stop" painted in large letters instead of the vari-colored flags now used by crossing watchmen; (4) uniform painting of crossing gates, and (5) uniform rules governing crossing watchmen while controlling or regulating street or highway traffic.

TRACK SPIKES

A design for a cut spike was submitted by the committee on track for formal adoption as standard by the association. This is similar to that which was proposed last year. It is characterized by the use of a head designed to take the blow of the hammer directly over the axis of the spike and thus minimize the damage to the head and danger of breaking during low temperatures. The nose is tilted downward to give a more rugged construction and to assist in the use of the clawbar when the spike is pulled. Reinforcement is provided on the back of the neck to force the spike forward against the base of the rail when driving, and also at the front of the neck to give additional metal for withstanding rail wear.

The committee also submitted as a matter of information a design of a so-called "dog-eared" spike. This is not provided with a flattened head, but has a nose like that provided on gib-head keys and has two ears at either side near the top to permit pulling the spike with the clawbar. Those who have used this type of spike report most favorably upon it. It is especially well designed for use with shoulder tie plates since it can be drawn more easily than the ordinary track spike. Furthermore, the additional metal in the head gives it a better resistance to corrosion. However, the committee added that where this type of spike is used it should have the same taper and general dimensions for the shank as the recommended standard design for cut spike with a flattened head.

In addition, a design for a standard screw spike was submitted because the committee considered that the present time, when comparatively few screw spikes are used, should be utilized to standardize screw threads before a number of different threads become prevalent. After a form of thread has once been adopted and generally used on any railroad, it would be a very serious thing to change the form or pitch of the thread since new spikes could not be placed in old holes without destroying the thread in the wood. The proposed standard thread has 15/32-in. pitch and 7/32-in. thickness at base. In the new design the root of the spike has been extended beyond the thread line to reduce injury to the wood fibers near the top of the hole in case the spike should be driven further than necessary with a hammer before applying the wrench. Also the head has been made oblong, with dimensions at the base of 13/16 in. x 1 3/32 in., instead of square, because it has been found that in the course of five or six years the ordinary square-head spikes will rust to a sufficient extent, when subject to salt drippings, to cause considerable trouble in removal, especially when the wrench is somewhat worn.

FLANGEWAYS FOR CAR WHEELS

In connection with the subject of wheel flanges and flangeways the committee referred to the comments last year of the Master Car Builders to the effect that nothing would be gained in the interest of safety or economy by adding metal to any portion of the flange of cast-iron car wheels in such location as will in any way affect track clearances. In consequence, the committee made no further report regarding the effect of increasing the thickness of cast-iron wheel flanges by ⅛ in., in accordance with the plan that has been generally discussed during the past few years, and asked to be relieved from further consideration of the subject.

In connection with the recent proposals to reduce the taper of the tread of car wheels to one in thirty-eight, as well as to cant all rails inward, the committee stated that it would be necessary to secure further data. Several roads are now experimenting with canted tie plates, although some have always made it a practice to cant rails inward, and in consequence further time for consideration of the subject was requested.

The committee submitted also specifications for manganese special work and with this included a new drawing showing standard dimensions and contour for grooves in all crossings and frogs, this calling for a width of 1¾ in. and a depth of 1⅞ in.

CHARACTER AND DEPTH OF BALLAST

In its report the committee on ballast submitted a statement to the effect that the various kinds of ballast now in use fall in the following order of effectiveness: (1) Stone; (2) washed gravel; (3) broken slag, not granulated; (4) pit run gravel; (5) chatts; (6) burnt clay or gumbo; (7) cinders. The committee recommended physical tests for both gravel and stone ballast, and stated that it had in hand the development of a "weathering test," owing to the fact that several serious failures of both stone and bank gravel had been reported on account of weathering. The committee also reported the results of tests where satisfactory results had been obtained with gravel having a content of 7 per cent or less of sand or small material that would pass through a ¼-in. screen. In consequence, the committee considered that the percentage of sand in gravel ballast as ordinarily recommended could be reduced, and that a definite statement on this matter would be submitted in a later report.

Considerable attention was devoted by the committee to the increase in the use of mechanical tampers. It was said that roadmasters who have used the pneumatic tie tamper to a considerable extent are enthusiastic in regard to it. The mechanical tamper is considered as a coming necessary track appliance where stone ballast is used, both as a matter of economy and for obtaining the best results. There does not seem to be any question now as to the superior results thus obtained. On main-line sections formerly having an allowance of ten men, the general opinion is that the use of the mechanical tamper would take the place of three men.

With regard to an investigation on the proper depth of ballast of various kinds necessary to insure uniform distribution of load upon the roadway, the committee summarized its conclusions by stating that the depth of the ballast under the tie on roadbed material, such as clay, loam, etc., subject to deformation by the application of live load, should not be less than the spacing, center to center, of ties. On material that approximates the character of good sub-ballast (which will not be deformed by the application of live load), the minimum depth of ballast under the bottom of the ties should be 12 in. Good initial drainage is thus provided as well as protection against upheaval by frost action. The ballast thus serves as a cushion rather than as a means for distributing the load.

In most cases a sub-ballast blanket of cinders not less than 12-in. thick is effective in preventing mud and similar material working up into the ballast. However, proper drainage of the sub-grade is essential to success with any kind of ballast.

The committee on ties submitted a tabulation of replies received from requests for information regarding the effect of design of tie plates and track spikes upon the durability of cross ties, and from this deduced the following general conclusions: The principal cause of past failures of the tie plate to protect the tie has been an insufficient area and thickness of the tie plate. Designs of tie plates with an equal bearing surface on each side of the rail have proven unsatisfactory. If the tie is to be protected properly, movement between the tie plate and the tie must be eliminated as far as practicable. The committee does not believe that, in general, the plates that are now considered satisfactory have sufficient excess strength to prove satisfactory throughout their life under normally increasing wheel loads and traffic conditions. Projections on the bottom of the tie plate should not be greater than 3/16 in. in depth.

PROLONGING LIFE OF CROSS TIES

Sufficient data have not been collected by the committee to permit definite conclusions as to the effect of different types of fastenings upon the life of ties, but it is considered that the use of cut spikes that are driven without boring holes not only hastens decay but seriously impairs the strength of the tie by the destruction of the wood fibers. A properly designed screw spike is least destructive of any of the present forms of fastenings in general use.

The committee also submitted a complete statement in regard to trials of metal, composite and concrete cross ties in which information furnished by the various railroads that use substitute ties was abstracted and the results shown in tabular form. This statement included all installations on steam railroads in America reporting to the association and covered practically all substitute ties used so far in this country by steam railroads. No summary of the results was published, but approximately one-third of the test installations had resulted in failures generally by breaking under traffic. In a number of cases, however, substitute ties that were installed as early as 1905 appeared to be still giving satisfactory service.

In connection with the treatment of ties, the committee on wood preservation commented on the fact that the Public Service Railway of New Jersey had used straight water-gas-tar oil in treating a majority of the company's ties since the year 1911. All of the ties received a full-cell treatment of 10 lb. of water-gas-tar oil per cubic foot. Although it is too soon to draw any definite conclusions from the treatment of these ties, up to date not a single one has been removed, and in an inspection made late in November, 1916, none of them showed any signs of deterioration. Ties that were removed for examination were found, after sawing, to be in excellent condition.

BRIDGE AND TRESTLES CONSTRUCTION

A comparison of the merits of wooden, ballast-deck trestles and structures of reinforced concrete was made by the committee on wooden bridges and trestles. In this the committee stated that, although in certain locations there is little probability of fire loss in creosoted ballast-deck timber trestles, the very nature of the material gave to reinforced-concrete a decided advantage in this respect. Also, concrete is slightly superior to timber for bridging waterways that are subject to flood currents or wide fluctuations in elevation of water level. Although the concrete trestle may possibly afford better service qualities than wooden trestles, this matter is so intangible in character as to preclude a definite statement of relative merits. Where selection of type is optional and is not influenced by other considerations, neither type of trestle has the advantage of the other in the matter of appearance. The use of concrete is, of course, more in accord with the theory of conservation of natural resources and industrial economy. Creosoted timber trestles are more economical than concrete, except when the cost of the concrete structure is less than one and one-half times the cost of the wooden structure. Adoption of either type should be the result of carefully weighed consideration for each individual bridge, the greater economy of timber trestles being balanced against the several advantages of concrete that are not susceptible of mathematical demonstrations.

With regard to the relative merits of galvanized and plain iron and steel fastenings for timber trestles, especially in relation to their use on creosoted structures, the committee stated that creosoted timber has a tendency to protect from corrosion any plain iron or steel fastenings that are embedded in the timber. The durability of such fastenings is at least equal to that of the creosoted timber that is used in trestles. Where timber is treated with straight creosote and drift bolts or other fastenings are covered entirely by the timber, it is good practice to use plain iron or steel. Such fastenings as are exposed to the action of brine drippings may be galvanized, but in general the existing information as to the increased life of fastenings so treated is not sufficient to permit the definite statement that the expense of galvanizing is justified. It is not necessary to use galvanized fastenings in creosoted timber structures over salt water.

Concrete piles were discussed at length and specifications for them were submitted by the committee on masonry. In brief, their use was advocated on the grounds that they permitted lighter foundations because they were independent of ground-water conditions and had greater bearing power than wooden piles. They serve also to make permanent trestle structures at considerably less cost than pier bridges when the height is not great. Straight piles should be used where rock or hard-pan can be reached or where the intermediate material is subject to flow. Tapered piles can be used advantageously where skin friction serves as a factor in the pile's bearing power. The cost of constructing and driving pre-cast concrete piles ranges from 75 cents to $2 per linear foot, with an average of $1 per foot. To obtain good results piles should be seasoned for from thirty to forty days before handling.

Preliminary Report by American Committee on Electrolysis

Statements of Fact Regarding the Problem of Electrolysis in the United States and Europe Are Submitted Without Recommendations

AT the convention of the American Railway Association, held last week in Chicago, there was presented through the members serving on the American Committee on Electrolysis a preliminary report of this national body. The report was printed with the advice that the draft contained only such statements of facts as the members agreed upon at this time and that it was the expectation ultimately to submit a further report embodying principles, rules and recommendations.

The report is the outcome of practically four years of work by the national committee, and it is extremely broad in scope, being divided into six general sections as follows: principles and definitions; methods of making electrolysis surveys; American practice; European practice; bibliography; and appendices containing tables of resistance for pipe and cable sheaths. The material contained in the first two sections is, of course, largely elementary and much of it has been outlined in various past issues of the ELECTRIC RAILWAY JOURNAL. In the section on American practice the report emphasizes the fact that there are no standards in the treatment of electrolysis problems in this country, and it outlines the various preventive measures that have been considered, beginning with those that have been applied to the electric railways themselves.

In part, under this sub-heading is included the plan of complete insulation whereby a separate insulated return conductor is employed for the return circuit instead of the running track, as well as the so-called plans of substantial insulation whereby the rails are not in actual contact with earth as on interurban railways, and partial insulation where special provision has been made to insulate the rails in so far as they can be when below the level of the pavement in city streets. Comment is made in regard to the use of high-grade bonding to reduce track voltage drops, and in this connection the report states that buried bare conductors, although they reinforce rail conductivity, increase the contact area between the return circuit and the earth, so that the resulting tendency to augment stray currents offsets to a greater or lesser extent the benefits attained by the reduction of voltage drop.

A special point is made of differentiating between the use of return conductors that are in parallel with the rails, even though insulated from them, and the so-called insulated track feeder system, which has for its prime object the mitigation of electrolysis. Comment is also made in regard to the renewed interest in the use of three-wire systems of the sectionalized type, as opposed to the type known as the parallel system whereby one trolley of a double-track road is negative and the other positive, the tracks being neutral.

Reference is made to the arrangement now in use in New Haven, Conn., where the rails are the positive conductor and the return is the trolley wire. It is found in this instance that all potentials and currents that formerly existed when the rails were negative have now reversed in direction but have the same magnitude. It is also found that current leaves underground structures over a widely-scattered outlying area. This arrangement has not been in operation long enough to determine whether or not the danger from electrolysis at any one outlying point will become serious, but the reversal of polarity renders extremely difficult the effective drainage of underground structures, because there is no definite point of minimum potential to which to drain.

With regard to the effect of alternating current the report states that the metal removed during the half-cycles when a pipe is anode may be in part replaced when it is cathode. Hence the total loss of metal on a given pipe is less than one-half of what it would be with direct current. Experiments on a laboratory scale indicate that the effect is usually less than 1 per cent and in most cases is negligible. In practice, however, it has not yet been determined whether alternating-current corrosion proceeds at the relatively slow rate thus indicated.

Special attention is given in the report to a description of the previously-mentioned insulated track feeder system, because this is employed in a number of American cities at the present time, and because plans are being made looking to its installation in a number of other cities.

A rather extended description of current practice in regard to the use of insulating joints is also given, but it is stated that the method is expensive and, unless used with caution, may introduce serious trouble at many points. It is usually regarded as an auxiliary measure to be used in certain cases only. Considerable attention is given also to the problem of insulating pipe, cable and structural steel from the earth, as well as to the use of an auxiliary anode or shield for the purpose of protecting the pipe from electrolytic action. The difference in desirability of the use of drainage for lead-sheathed telephone and power cables and for pipe systems is pointed out at some length, since a drainage connection from an underground piping system generally causes a very much larger flow of current than on an underground cable system.

The section dealing with European practice is particularly interesting. In this it is stated that Germany, through voluntary co-operation, has probably remedied the former dangerous electrolysis conditions in all of its important cities. The instrumentality of agreements on definite technical standards was sought in preference to legislation. France has not been as successful in bringing about prompt results through legislation as has Germany through technical co-operation. England, which has had the benefit of government regulation for many years, has now no electrolysis troubles or disputes. In general, these satisfactory results have been obtained by the maintenance of good bonding, by liberal separation of pipes and rails, by the avoidance of bare copper returns and the use of insulated returns on all installation where the voltage drop in the rail is high, by the use of the insulated track feeder system, and by frequent substations to give close line regulation. It is thus evident that disputes on account of electrolysis troubles were prevalent in all countries before systematic co-operation was effected.

In Germany insulated return feeders are used almost universally. They are used also in England where it is necessary to bring the rail drop within the Board of Trade regulations, negative boosters being more extensively used than in Germany.

Over-all limits for voltage drop vary greatly in Germany, but in the majority of cases they are between 5 volts and 10 volts on systems that have not been remodeled in accordance with the regulations of the Electrolysis Commission. On other systems the voltage drop is between 2 volts and 5 volts. In England, over-all voltage drop is generally very much lower than the Board of Trade requirements, averaging probably between 2.5 volts and 3 volts excepting at times of extraordinarily heavy traffic. Potential differences between pipes and rails are said to be generally less than 1 volt. In all cases negative feeders are designed for equal voltage drops.

Electrical drainage was formerly applied in one or two cases in Germany, but abandoned on account of damage that it produced because of corrosion at joints and damage to other underground structures. Neither is it approved as a general measure to afford relief from stray currents in England. It is pointed out in the report, also, that the tramway power demands are much less in Europe than in America, the difference in demand between Manchester and Boston being in ratio of 1 to 7, although the cities are of equal population.

Other comments on European conditions include statements that the trolley wire was originally made negative in two towns in Switzerland, but that the scheme has been abandoned in both cases, and that the three-wire system has been used in a very few cases in Europe. In general, insulating joints are not used at all for water pipes. In Germany it is held that insulating coverings do not afford protection against electrolysis as their effect is merely to concentrate escaping stray currents since perfect coverings cannot be maintained. Neither are they considered as a satisfactory protection in England. Insulating joints for telephone cables are used neither in Germany nor in England. In Germany a definite distinction is made between corrosion due to chemical action of the soil and that produced by stray current. The existence of chemical action also is accepted in England. Where German municipalities own the water, gas and street railway systems, they may prefer to assume the cost of damage rather than make larger expenditure for the protection of their pipes. Opinions differ in Germany as to whether the prevailing regulations constitute a hardship, but in England they are nowhere regarded as such.

Successful Regulation Must Be Upward as Well as Downward

New England Street Railway Club Demonstrates Its Patriotism at Annual Dinner—Officers for 1917-1918 Were Elected

A BRILLIANT and candid analysis of the problems of public utility regulation was the striking feature of the seventeenth annual banquet of the New England Street Railway Club at the Hotel Somerset, Boston, Mass., March 22, set in patriotic surroundings and attended by about 500 members and guests.

The national colors formed the appropriate principal theme of the banquet hall decorations, and patriotic enthusiasm ran high throughout the evening. As the members and guests entered the room and took their places the hall was darkened and the figure of Columbia was thrown into relief in a corner under a spotlight amid great applause. The lights were then thrown into circuit, and hundreds of balloons with small American flags attached rose to the ceiling amid the strains of the "Star Spangled Banner." These incidents set the tone of the entire evening, which was sustained by the music of the Salem Cadet Band, coming to a climax in the passing of a resolution, presented by President-elect Ford, offering the support of the club to the national government in the present international crisis.

The menu was unusually original, being printed as a replica of the club "bulletin," and abounding in timely hits with cartoons and jokes appropriate to the occasion.

During the evening Hon. James M. Curley, Mayor of Boston, entered the banquet hall, accompanied by ten junior officers of the Argentine Navy, who have enlisted for service under the flag of the United States in case of eventualities. In a masterly address Mr. Curley pointed out this and other evidences of the entente cordiale between South and North America. Representatives of the sister republic to the south responded in kind. Upon motion of M. C. Brush a committee was appointed to draft a cablegram of appreciation to the President of the Argentine Republic, for his co-operation in placing these naval officers at the service of this country.

Arthur A. Ballantine, Boston, officiated as toastmaster, and in the absence of Governor McCall introduced Hon. C. L. Burrill, treasurer of Massachusetts, who extended the greetings of the State. The next speaker was Edward K. Hall, vice-president of the Electric Bond & Share Company, New York, who discussed public utility regulation. An abstract of his remarks follows:

IS PUBLIC UTILITY REGULATION A SUCCESS?

Regulation has accomplished much, but it is not a success in the broad sense of the word. Rebates and discriminations have been cut out, with excessive and unreasonably high rates, which were relatively few in number. Duplication of facilities has been largely eliminated. Regulation has given the public right of appeal to another tribunal, but regulation of rates has in the past been largely downward. Rate regulation upward is a large problem to many commissions. The public expects the companies to be able to take care of themselves.

The value and quality of the service greatly exceed the importance of the rate itself. The importance of this branch of regulation (revision of rates upward) has not been sufficiently appreciated. Even if rates are 5 or 10 per cent too high it is not a serious matter compared with maintaining the highest quality of service. No public utility can be properly developed by merely putting a fixed sum into it. Rates must be high enough to draw new money into such enterprises. In future rate revision upward will occupy the attention of regulatory bodies to a far greater extent than in the past. Companies must receive enough revenue so that they can do their work right. Ninety per cent of the public, of the commissions and the companies are fair-minded once they know the facts. The three parties need to appreciate still more their common interest to develop mutual confidence. The companies should not be afraid of the commissions, and the latter should stand up and decide all cases purely on their merits. Companies must inform the public that they are doing work as they should, as well as doing it as well as can be done. The surface hasn't yet been scratched in educating the public. Do not try to "bluff out" mistakes. Let the public help the commissions to render impartial decisions, and let the commissions' terms of office be as long and as secure as that of the judges in the courts. Prosperous companies giving the best service are the best possible tribute to commission regulation. Commissions are realizing their true function as mediators more than before and are coming to appreciate that burdens can be placed on companies more easily than they can be taken off, and they are less disposed to add burdens than heretofore. The Massachusetts law requiring a man of the requisite caliber of a public service commissioner to devote his entire time to this work is a crime. Constructive criticisms without undue publicity are helpful to the companies. Commissions should not make companies suffer for the sins of others or visit condemnation upon company officers for the wrongdoings of their predecessors. The punitive period of regulation is giving place to the constructive period, in which co-operation will be the key to successful supervision.

Other speakers were L. E. Wilson, manager American City Bureau, New York, and W. R. Balch, war correspondent of the Boston *Transcript*.

NEW OFFICERS

The following officers for 1917-18 were elected at the business meeting in the afternoon: President, A. H. Ford, Portland, Me.; vice-presidents, J. E. Dozier, Massachusetts; Edward M. Graham, Maine; J. Brodie Smith, New Hampshire; W. F. Corry, Vermont; A. E. Potter, Rhode Island; R. W. Perkins, Connecticut; secretary, H. A. Faulkner, Boston; treasurer, Fred F. Stockwell, Cambridge, Mass.; executive committee, C. V. Wood, Springfield, Mass.; James H. Murphy, Taunton, Mass.; H. M. Steward, E. G. Young, A. P. Emmons, J. W. Belling and A. A. Hale, Boston; finance committee, A. H. Ford, C. D. Emmons, Framingham, Mass., and W. A. Gilman, Boston. F. F. Stockwell was chairman of the banquet committee. D. A. Belden, Haverhill, Mass., and W. W. Field, Cambridge, Mass., were chairmen of the reception committee.

Standard Safety Code in Booklet Form

REALIZING the formidable appearance which the Bureau of Standards electrical safety code presents to the small electrical property, where the work of all departments is handled by two, three or four men, the Wisconsin Railroad Commission has made an exhaustive study of this voluminous work and prepared a small 26-page booklet which puts the code, reduced to lowest terms, before the utility operators in a form which will receive their attention. In the majority of cases, if the whole unabridged code were depended on for trial, it would be laid aside and overlooked by the smaller property officials, and the majority of the properties in Wisconsin belong to this class. The preparation of this condensed set of rules, covering as it does the points demanding attention, is indeed a valuable service to the electrical industry of Wisconsin.

The manner in which this booklet places the essentials of the code before the operators in so condensed a form is interesting and valuable. For instance, it is divided under general subdivisions, as grounding, lightning protection, exposed current carrying parts, strength of line, supports, etc., and then under each of these there may be several paragraph rules. Each of these rules gives the substance of perhaps a number of paragraphs in the Bureau of Standards code, and then gives the numbers of the paragraphs from which points included in the rules were taken, or paragraphs in the code covered by this condensed rule. In some cases the listing of the paragraph reference numbers consumes as much space in the booklet as the statement of the rule itself. At the very least, this bringing together under one head of all subject matter scattered through the code referring to that point, will be of great value to the operating men, for it will enable them to look up a point in question in the booklet and then turn to the listed references in the code for a full study.

American Association News

Appointments of Manufacturers to Engineering Association Committees Completed—Meetings of Joint Committees on Overhead Specifications and Standardization of Insulator Threads, Committees on Fares and Transfers, and Valuation and T. & T. Executive Committee Were Held Recently

Engineering Association Committee Appointments

As announced in the issue of the ELECTRIC RAILWAY JOURNAL for March 10, page 443, the technical committees of the Engineering Association are being augmented by the addition of representatives of the manufacturers. In addition to the appointments listed there, the following have been announced by Secretary E. B. Burritt:

Committee on Way Matters: Chester F. Gailor, Atlantic Welding Corporation, New York City; H. Fort Flowers, Differential Car Company, New York City; Nicholas B. Trist, Carnegie Steel Company, Pittsburgh, Pa.

Committee on Equipment: W. S. Adams, J. G. Brill Company, Philadelphia, Pa.; A. A. Green, Columbia Machine Works and Malleable Iron Company, Brooklyn, N. Y.; G. W. Lyndon, Association of Manufacturers of Chilled Car Wheels, Chicago, Ill.; C. F. W. Rys, Carnegie Steel Company, Pittsburgh, Pa.; N. W. Storer, Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.; E. D. Priest, General Electric Company, Schenectady, N. Y.

Committee on Power Generation: E. E. Gilbert, General Electric Company, Schenectady, N. Y.; Francis Hodgkinson, Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.

Joint Committee on Overhead Specifications Completes Revision Work

A second two-day joint conference of representatives of the Engineering Association and the Associated Manufacturers of Electrical Supplies, held in Chicago, on March 1 and 2, was devoted to the adjustment of differences in the specifications of the two associations for ears and other bronze fittings and pole line hardware. The work of revision and harmonization of the overhead specifications of the two associations was practically completed at the conclusion of this meeting and will be written into final form for a report to the power distribution committee of the Engineering Association and the line material section of the Associated Manufacturers at their next respective meetings.

The Engineering Association was represented by E. J. Blair, Chicago, chairman of the sub-committee; A. Schlesinger, Indianapolis, and C. E. Fritts, Kansas City. The Manufacturers' Association was represented by C. C. Beck, Ohio Brass Company, chairman; James H. Drew, Drew Electric & Manufacturing Company, and William Schaake, Westinghouse Electric & Manufacturing Company. Carl L. Peirce, Jr., Hubbard & Company, and R. C. Boozer, Joslin Manufacturing & Supply Company, sat through this meeting at the invitation of the manufacturers' committee, in order that accurate information might be had concerning pole-line hardware.

Standardization of Threads for Insulators and Insulator Pins

In an endeavor to standardize the threads for insulators and insulator pins, a joint committee representing several national organizations interested met at the American Association headquarters on March 6. Those present were: J. T. Barron, American Institute of Electrical Engineers; J. A. Brundige, National Electric Light Association; R. F. Hosford, American Telephone & Telegraph Company, and C. R. Harte, American Electric Railway Association.

A specification suggested by the manufacturers was considered in some detail and the following tentative conclusions were reached: (1) In view of the release turn requirement it is inadvisable also to fix diameter limits at pins or pinhole tops other than the nominal diameter. (2) Because of the liability to deformation and to rapid wear, the use of lead for the gage is inadvisable. Further, it is desirable to use a gage thread more nearly like the actual thread as formed. (3) The release turn to be prescribed should be decided upon after tests to determine the holding power of different amounts of engagement. Mr. Barron is to make these tests and Mr. Harte is to secure the necessary insulators and pins, the former with both glazed and unglazed pin holes.

Mr. Hosford exhibited steel pin and insulator thread gages for the telephone thread, and stated that he would secure details of wood pin manufacture with particular reference to the limits of accuracy which can reasonably be required.

Fares and Transfers

A meeting of the T. & T. Association committee on fares and transfers, C. S. Ching, Boston, Mass., chairman, was held in New York City on March 8 and 9. The topics discussed were the use of cars of ordinary type as prepayment cars without fare boxes, and the use of prepayment cars on routes having more than one fare zone. Information which had been collected through the medium of a data sheet indicated great variation in practice in the matter of fare collection. It was evident that the fundamental principles would have to be formulated, and an attempt made to codify existing practice.

The committee also asked permission of the executive committee to file a supplementary report on a device for collecting fares on prepayment cars on systems having more than one fare zone. In view of experiments now being conducted by railways and others which the committee plans to conduct it was felt that the subject is of sufficient interest and timeliness to warrant discussion at the coming convention.

Those present at the meeting besides the chairman were: G. S. Brush, Portland, Me.; R. W. Emerson, Cleveland, Ohio; W. C. Harrington, Kansas City, Mo., and E. E. Strong, Rochester, N. Y.

Other Recent Committee Meetings

The executive committee of the Transportation & Traffic Association met in New York on March 10. Those present were L. C. Bradley, Houston, Tex.; L. H. Palmer, Pottsville, Pa.; R. P. Stevens, Youngstown, Ohio; J. J. Dempsey, Brooklyn, N. Y.; H. C. Donecker, Newark, N. J.; H. B. Potter, Boston, Mass., and E. B. Burritt, New York City. The convention program was tentatively discussed, the personnel of the committee on standards and review was taken up with Mr. Palmer, and the revision of the code of instructions to committees was approved.

A meeting of the committee on valuation was held in New York on March 7. The principal work of the committee was to review the criticisms from member companies of the code of definitions. A number of these were incorporated in the code, but the committee will meet again before preparing its final report on the subject. Those who attended the New York meeting were P. J. Kealy, Kansas City, Mo.; J. N. Shannahan, Hampton, Va.; B. E. Tilton, Syracuse, N. Y.; C. G. Young, New York City, and Martin Schreiber, Newark, N. J.

Meeting of Connecticut Company Section

There was a total attendance of 249 at the February meeting of company section No. 1. The meeting was at the Hotel Stratfield in Bridgeport, and was preceded by the usual dinner. Entertainment consisted of several vocal selections, and a musical program by the company section orchestra.

The principal speaker of the evening was Charles H. Chapman, manager Bridgeport division, who read a paper on the betterment of trolley service during the growth of the city of Bridgeport, and outlined the efforts of the Connecticut Company to provide adequate service. Following Mr. Chapman's paper, Mayor Wilson of Bridgeport, addressed the meeting on the subject of the relation between the city railway and the local industries. Other addresses were given by Public Utilities Commissioner Charles C. Elwell on the various duties of the commission tending toward better regulation, and also by a member of the Chamber of Commerce on the work of that body to improve relations between the city and the railway.

Denver Tramway Section

The forty-third session of the Denver Section was held on March 15 with an attendance of 150. The feature of the meeting was a paper on "Publicity and Pay as You Enter," by J. C. Davidson, publicity agent and editor of *Tram-O-Grams*, the company publication. The appropriateness of the paper was due to the fact that the pay-as-you-enter system of fare collection is now being installed on the Denver Tramway System. The paper was widely discussed and the discussion was closed by F. W. Hild, general manager. Mr. Hild showed how meetings of the kind can be of great benefit by bringing the attendants to realize how the company's affairs are handled.

The topic for discussion at the Feb. 15 meeting of the Denver Tramway Company section was "Trainmen's Records and Transfers," a paper on this subject being read by C. E. Buehler of the auditing department. It was followed by supplementary papers and remarks from a number of trainmen and by a general discussion. Secretary Mundhenk reported an exceptionally lively and interesting meeting with an attendance of 250.

Methods of Giving Signal Indications Discussed

At the Meeting of the Railway Signal Association in Chicago Emphasis Was Laid Upon the Reliability of Light Signals as Opposed to Semaphores

A STATED meeting of the Railway Signal Association was held at the Auditorium Hotel, Chicago, Ill., on March 19, 1917. Among the various reports of committees was that of the committee on signaling practice in which there were discussed various methods of giving signal indications other than by means of the semaphore. The committee stated that colored and position-light signals for day and night use reduced the number of signal failures by eliminating all moving parts except the control relays, and that light signal aspects have greater visibility and range under adverse weather and background conditions than the semaphore, while the close conditions compare favorably. Also light signals give uniform indications at all times.

In general practice the number of aspects of any one arm of a semaphore is limited to three. With the position-light signal four distinctive positions may be used, while the number of indications given by colored-light signals is limited only by the number of colors available. Where power is obtainable the cost of operating light signals is less than that for operating motor-driven signals, the current consumption under normal automatic signal conditions being 20 watts per signal for the position-light type and from 35 watts to 50 watts for one of the colored-light type. The cost of maintenance of both types of light signal is considerably less than that of semaphore signals. The colored-light type has fewer lamps to renew than the position-light type, and therefore has an advantage in this respect.

In general, where power is available, the light signal is preferable to the semaphore. Position-light signals can be installed at any location where clearance will permit the present standard semaphore to be erected. The colored-light signal, however, can be used in more restricted clearances.

Comment was made also by this committee in regard to the desirability of having an overlap in automatic signaling. It was stated that overlaps are undesirable for following movements, because adequate advance information can be provided in the signal systems. However, overlaps are necessary for opposing movements where adequate advance information cannot otherwise be provided.

A feature of the report of the committee on standard designs was the submission of two new drawings to show a proposed standard location for the supports for highway-crossing signs, both of these drawings providing for the location of the warning sign over the center of the highway. In one case the sign is mounted upon a pole set in a concrete base on the center line of the line and as close as conveniently possible to the track. The other design provides for the sign to be supported on a truss construction spanning the roadway between two poles, the sign, as before, being on the center line of the highway. In either case the drawing calls for a warning sign of the usual diagonal-board type but illuminated by a lamp in front of it, the preferred source of light being electric power.

COMMUNICATIONS

Standard Classification for Trucks

INDIANAPOLIS TRACTION & TERMINAL COMPANY
INDIANAPOLIS, IND., March 12, 1917.

To the Editors:

We have carefully gone over the matter of a uniform system of truck classification outlined in a recent article by S. A. Bullock and have no suggestions to make in regard to any changes or additions to the plan as proposed. It would seem that the adoption of a system of this character should largely simplify the ready identification of trucks of various types, and this would be a very great advantage to the street railway industry.

ROBERT I. TODD, President.

Penalizing Travel on Electric Roads

UNION TRACTION COMPANY OF INDIANA
ANDERSON, IND., March 17, 1917.

To the Editors:

In your issue of July 29 you published an editorial under the heading "Accident Insurance Associations Penalize Travel on Electric Railways." This subject has interested me for several years, and so far as possible, I have endeavored to call attention to the injustice of the attitude of the accident insurance associations, to which you refer under the very fitting title above quoted. The matter was taken up in 1914 with one of the accident associations by our Central Electric Railway Association without results, except replies containing the argument about the insurance companies not desiring to take on additional hazard.

The by-laws of most of the insurance associations referred to provide that a double death benefit shall be paid if a member is killed ". . . while riding as a passenger inside a passenger car or passenger coach of a railroad train *propelled by steam*. . . ."

These words "propelled by steam" are unfair to the electric railway industry. They not only give the erroneous impression that traveling by steam trains is safer than traveling by electric lines, but they discourage the commercial traveler from patronizing our railways. As you stated very clearly in your issue of July 29, the statistics of the electric interurban steam railroads in the principal central states, so far as the figures were available then in the published reports of the commissions up to 1914, show that the ratio of passengers killed or injured to the total number of passengers carried was small for the electric roads as compared with the steam railroads. Even as long ago as 1911, before the safety first campaigns were in full swing and accidents had been greatly reduced on the electric roads, there were handled on the steam lines in Ohio 41,912,468 passengers and on the electric roads 155,215,899. On the steam lines 56 passengers were killed and 741 injured, whereas on the electric lines, only 11 passengers were killed and 522 injured. Other years and states show similar figures in favor of the electric lines.

Of course, I realize that every additional activity on the part of the insured to which the policy grants double payment in case of accident, costs the association money. For instance, if the association should extend the double liability to taxicabs, it would cover an additional hazard. But with the electric road there is a different situation. If the commercial traveler uses the electric road between two cities, he does not use the steam road for that journey, and as the electric road is safer, the association would actually save money by extending its double liability clause. Moreover, if double liability was granted on electric lines, it would be a very strong talking point.

As the double liability clause reads at present it is bad advertising for our industry, and it seems as though we should make every possible effort to have the discrimination removed.

S. R. DUNBAR, Purchasing Agent.

The Advertising Policy of "Aera"

FORD, BACON & DAVIS
NEW YORK, March 19, 1917.

To the Editors:

I have read with much interest the report of the committee on the publishing policy of the American Electric Railway Association.

My discussion of this matter with electric railway officials has convinced me that there is a feeling among the members of the association that *Aera* in its present form is too much of a magazine for an association publication.

Among engineers I find that not nearly so much attention is paid to *Aera* as to the ELECTRIC RAILWAY JOURNAL, the general opinion being that the latter fully covers the field and they have not time to read *Aera* also.

The electric railway publishing field is necessarily limited, and it has always been a matter of surprise to me that your publication could afford so satisfactorily to serve its readers. A division of support between these two publications must eventually lead to weakening the JOURNAL, and this we would all very much regret.

My conclusion would be to restrict the activities of *Aera* to those pertaining to a bulletin of the association.

FRANK R. FORD.

Publicity Conference Proposed

UNITED RAILWAYS & ELECTRIC COMPANY
BALTIMORE, MD., March 20, 1917.

To the Editors:

In view of the growth of interest among railway companies in publicity matters, the large recent increase in the number of company publications, and the development of systems of educating the public to a knowledge of the business of railroading and of promoting a kindly interest among employees for their employers, I take the liberty of suggesting that greater attention be given to this important branch of the electric railway business at the next annual convention. Surely the organization of a publicity branch would be of great mutual assistance in furnishing a means for the interchange of ideas that have been successfully tried by the publicity men in advancing the interests of their respective companies. It would also be most helpful if an exhibit of the work done by the various railway companies in a publicity line should be made in connection with this conference.

DWIGHT BURROUGHS, Publicity Manager.

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Car Axle-Changing Method Uses Pit with Inclined Floor

Axle Is Lowered and Carried Off by Truck After Jacks Raise Car Body, and 6-Ft. Rail Lengths Spanning Pit Recess Are Removed

BY A. WADE
Master Mechanic Rome Railway & Light Company, Rome, Ga.

An efficient method for changing single-truck axles is being used by the Rome Railway & Light Company. The walls of a pit which is built between track rails have been recessed at one point to allow the lowering of an axle. The length of the recess is such that removable rail splices, 6 ft. in length will span the opening, and rest on the jutting walls. The splices are held in place by the customary joint plates. The pit floor is on an incline to allow an axle truck to be easily pulled away. Thus by jacking up a car and removing the rail splices, an axle may be lowered by pit jacks to a truck resting on the inclined floor and carted off so as to allow another axle to be inserted by reversing the procedure.

When an axle of a car is to be changed the car is placed so that the axle will be directly above the jacks located in the pit. Other jacks then raise the end of the car body sufficiently high for the wheels to clear the rails and the axle is held by the pit jacks while the 6-ft. lengths of rail are removed. The axle is then lowered until it rests on a swiveled cradle which is attached to an axle truck placed between the pit jacks and resting on the inclined floor of the pit. The axle truck is mounted on three wheels and has a hand steering wheel operated from behind. The cradle of the axle truck is mounted on an old center bearing and will turn to any position.

The axle, on being lowered to the truck, is swung around lengthwise of the pit and the truck is pulled by an extra car up the inclined floor to a point where the wheels will clear the rails. The axle is then swung around and the axle truck is allowed to roll down the incline thereby leaving the axle behind as the wheels are intercepted by the rails. The old axle is then rolled out of the way and a new axle placed under the car by reversing the above operation. To change the axle at the other end, the car is moved along the track until the other axle is in place over the pit jacks.

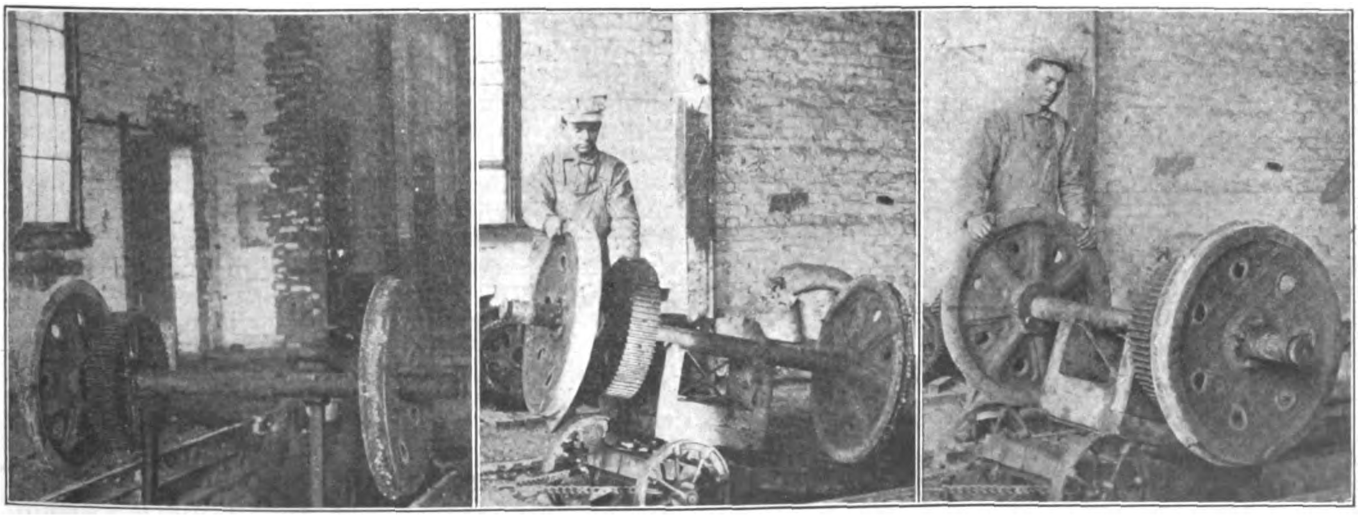
The pit jacks have a lift of 5 ft. necessitating wells in the pit floor for lowering the step bar. With this arrangement two men can remove worn wheels and place new wheels under a single truck car in one hour. The cost of equipping the pit complete was $30.

Killing Weeds by Chemical Treatment

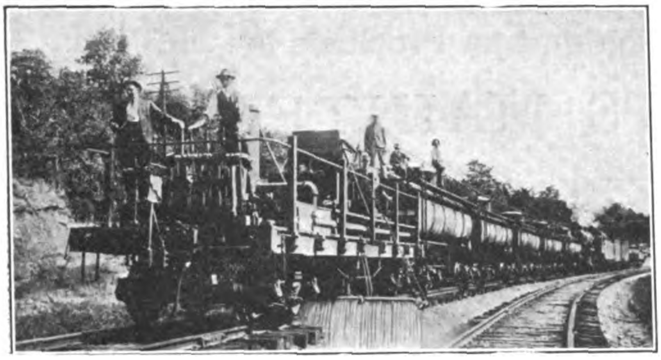
Application of Chemical to 125 Miles of Track Per Day Accomplished with Large Sprinkling Train

It is difficult to compare the results and costs of the three methods commonly used on interurban properties to kill weeds, namely, hand weeding, burning, and the application of chemicals. Different standards of maintenance are approved by different officials and the same items of expense may not be included in costs compiled for any one method. Practices of different roads vary with respect to the width of weeded area, and weeds on some properties are more difficult to eradicate than on others.

The use of a chemical weed killer is perhaps the most effective. It kills the vegetation by eating into the fiber, its effect is extended in a measure to the root of the plant and it sterilizes the soil so that further weed growth is not promoted. Due to the sterilizing of the soil, the effects are cumulative so that it can be used in



THREE VIEWS ILLUSTRATING AXLE-CHANGING METHOD SHOWING AXLE: (1) RAISED CLEAR OF RAILS; (2) PULLED UP INCLINE; (3) READY TO BE REPLACED ON RAILS



SPRINKLING TRAIN FOR EXTENSIVE APPLICATION OF WEED KILLER

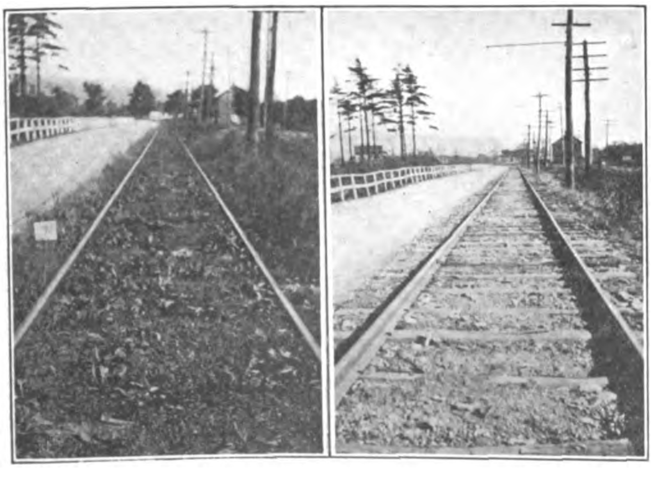
smaller quantities in succeeding years. The most economical application requires a study of prevailing conditions. It is claimed that the chemical also has a preservative effect on wood ties and metal equipment.

Good results have been obtained from the use of Atlas "A" weed killer of the Chipman Chemical Engineering Company, Inc., New York, formerly the Atlas Preservative Company. A description of this process was given in the issue of this paper for Aug. 30, 1913, page 345.

The use of the method on a larger scale than therein described involves employing a sprinkling train as shown in an accompanying illustration. The train consists of a tank car containing the chemical and others carrying water for diluting the chemical. A flat car with the sprinkling head has a gasoline engine and a centrifugal pump to fill the tank cars with water and to draw the mixture into the sprinkler at the necessary pressure through a common main into which all the tanks discharge. The train is propelled by a locomotive and a special car drawn in the rear sprinkles an odor compound to render the vegetation repellant to cattle. About thirty miles of track can be treated with one loading with this train, or a total of about 125 miles per day.

The sprinkling head of the flat car extends over a width of 14 ft. and is so arranged as to divide the width of track under treatment into five sections. The operator observes the distribution of weeds and operates the sprinkler divisions to treat particular sections of the tracks in the necessary quantities. The tank cars are equipped with devices using compressed air to agitate the solution. A meter is used to measure the amount of solution passing into the sprinkling head.

The best results are obtained by sprinkling in dry weather or when the vegetation is capable of absorbing the liquid. For ordinary conditions about 8 gal. of the chemical is recommended for the first treatment per foot of width of track one mile long. The amount used varies with the resistive qualities of the weeds, the fertility of the soil and the density of growth across the track. The application for the succeeding years depends upon the amount of regrowth. The amount of dilution with water is about 1 to 20 depending upon the condition of the soil, the water being used simply to convey the chemical. If the ground is dry and porous and apt to hold the moisture, more water is used to carry the chemical to the roots of the plant.



SECTION OF TRACK, SHOWING WEED GROWTH; SAME TRACK AFTER ONE APPLICATION OF WEED KILLER

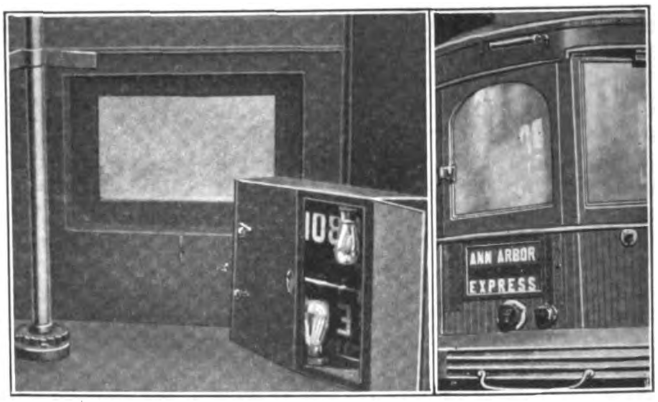
A second illustration shows a weedy track, and the same track seventy days after application of the weed killer on one of the Western New York & Pennsylvania Traction Company's lines.

Interchangeable Interurban Destination Sign

BY C. L. KELLER

Assistant Master Mechanic Detroit United Railway

In order to facilitate the transfer of passenger cars from one division of the property to another, we have found it convenient to equip the cars with interchangeable destination sign boxes which may be easily and quickly taken out of one car and put in another. These consist of a 25-in. x 17-in. wooden box, 6 in. deep, made standard for all interurban cars and containing two Electric Service Supply Company roll curtains and three electric lamps. These are designed to set in a recess in the dash and be flush with either side. A pane of glass over the opening in the dash protects the curtains from the weather. Sheet steel doors on the back of the box open so that the motorman can read the signs when setting them, which he does by means of two cranks extending through the back of the box.



INTERCHANGEABLE SIGN REMOVED FROM RECESS IN DASH, AND ON FRONT OF INTERURBAN CAR

When it is desired to transfer a car from one division to another, the trainmen have simply to take out one sign box and insert another or interchange the boxes in two cars when one is pulled off a run and another put on in its place. Two contact springs on the bottom of the recess and metal strips on the bottom of the sign box automatically connect the sign lamps in the lighting circuit when the box is put in place in the dash.

This destination sign scheme not only minimizes the trouble of changing a car from one line to another, but it reduces the number of signs required for each division or makes possible the use of a shorter curtain for each sign, avoids the necessity to resort to special makeshift signs, and generally facilitates the inter-use of equipment over the system.

Maintaining Substation Efficiency

Reduction of Substation Losses Offers Opportunity for Substantial Power Saving

BY D. E. CROUSE
Chief Engineer, Auburn & Syracuse Electric Railroad, Auburn, N. Y.

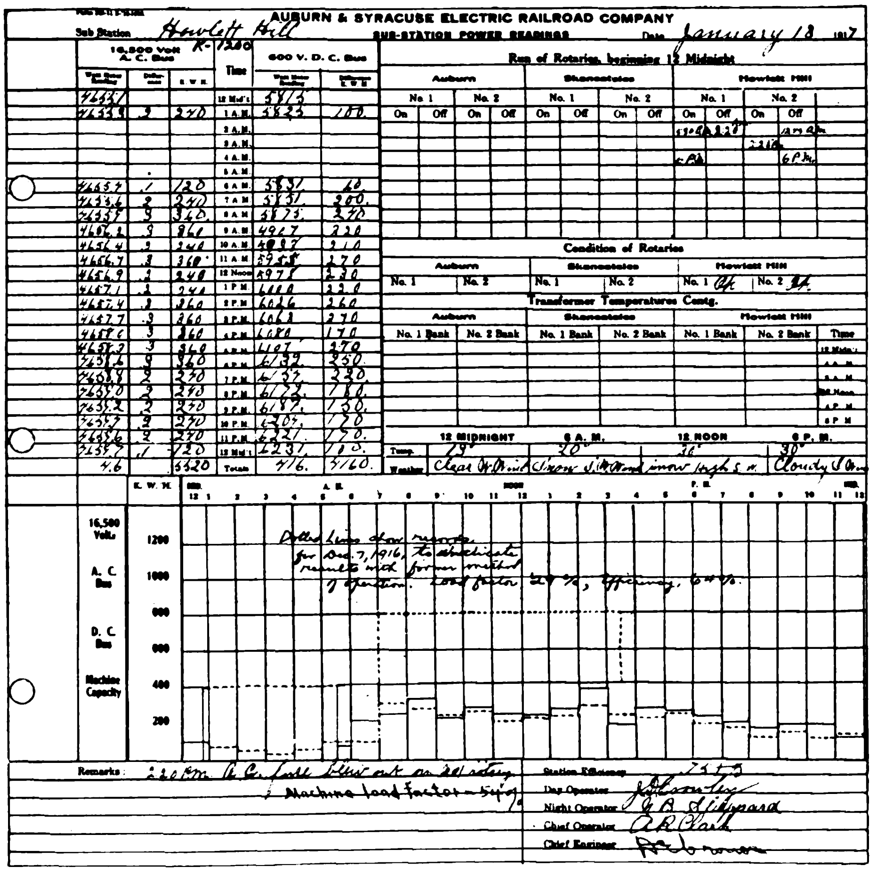
The introduction of automatic substations gives the railway field a vision of the time when something approaching ideal efficiency will be obtained from the rotary converter when used as a means for converting alternating-current power to direct-current power. Many of us will, however, be compelled to content ourselves with manual operation for the present, or at least until such time as the automatics have proved their reliability.

It is well understood that due to the misfit application of rotary unit sizes on many interurban railroads the machine load factor is very low, in some cases as low as 30 per cent. The machine load factor may be materially raised if integrating meters are employed to give the operator definite knowledge of the station input and output. When meters are not installed on both incoming and outgoing buses a really conscientious operator may not be loading his machines to their capacity without being aware of this condition.

The three substations of the Auburn & Syracuse Electric Railroad use power purchased at the alternating-current bus and therefore have always had wattmeters installed on the incoming lines. On Dec. 1, 1915, in addition, direct-current wattmeters were installed on the outgoing buses of each substation, and the result has been as described below.

A substation log sheet, as shown opposite, was adopted as a means of recording energy readings, and for the purpose of placing a graphic representation before the operator. The operators make their own records on the log sheets and plot their charts.

It is the firm belief of the writer that a very great part of the benefit which comes as a result of the meter installation is derived from the psychological effect on the operator which plotting his own record produces. The keeping of a log sheet causes him to concentrate his attention on the meters with the result that the machine capacity is more closely graduated to the load.



Sub Station Howlett Hill

AUBURN & SYRACUSE ELECTRIC RAILROAD COMPANY
SUB-STATION POWER READINGS
Date January 18 1917

16,500 Volt A. C. Bus R-1200 Watt Hour Meter Reading	Difference	K. W. H.	Time	600 V. D. C. Bus Watt Hour Meter Reading	Difference K. W. H.
4655.1			12 Mid't	5813	
4655.3	.2	240	1 A.M.	5823	100.
			2 A.M.		
			3 A.M.		
			4 A.M.		
			5 A.M.		
4655.4	.1	120	6 A.M.	5831.	60.
4655.6	.2	240	7 A.M.	5851.	200.
4655.9	.3	360.	8 A.M.	5875.	270
4656.2	.3	360	9 A.M.	4927	220
4656.4	.2	240	10 A.M.	5921	210
4656.7	.3	360	11 A.M.	5948	270
4656.9	.2	240	12 Noon	5971	230
4657.1	.2	240	1 P.M.	6000	220
4657.4	.3	360	2 P.M.	6026	260
4657.7	.3	360	3 P.M.	6063	270
4658.0	.3	360	4 P.M.	6080	170
4658.3	.3	360	5 P.M.	6107	270
4658.6	.3	360	6 P.M.	6132.	250.
4658.8	.2	240	7 P.M.	6157.	220.
4659.0	.2	240	8 P.M.	6172.	180.
4659.2	.2	240	9 P.M.	6187.	150.
4659.4	.2	240	10 P.M.	6204.	170
4659.6	.2	240	11 P.M.	6221.	170.
4659.7	.1	120	12 Mid't	6231.	100.
4.6		5520	Totals	416.	4160.

Run of Rotaries, beginning 12 Midnight

Auburn No. 1 On	Auburn No. 1 Off	Auburn No. 2 On	Auburn No. 2 Off	Skaneateles No. 1 On	Skaneateles No. 1 Off	Skaneateles No. 2 On	Skaneateles No. 2 Off	Howlett Hill No. 1 On	Howlett Hill No. 1 Off	Howlett Hill No. 2 On	Howlett Hill No. 2 Off
									12.28		12.15 AM
										2.16	
								6 AM			6 P.M.

Condition of Rotaries

Auburn No. 1	Auburn No. 2	Skaneateles No. 1	Skaneateles No. 2	Howlett Hill No. 1	Howlett Hill No. 2
				OK	OK

Transformer Temperatures Centg.

Auburn No. 1 Bank	Auburn No. 2 Bank	Skaneateles No. 1 Bank	Skaneateles No. 2 Bank	Howlett Hill No. 1 Bank	Howlett Hill No. 2 Bank	Time
						12 Midn't
						4 A. M.
						8 A. M.
						12 Noon
						4 P. M.
						8 P. M.

	12 MIDNIGHT	6 A. M.	12 NOON	6 P. M.
Temp.	29°	20°	36°	30°
Weather	Clear W. Wind	Snow S.W. Wind	Snow high S. W.	Cloudy S. W.

Dotted lines show records for Dec. 7, 1916, to indicate results with former method of operation. Load factor 29%, efficiency 64%.

Remarks: 2.20 P.M. A.C. fuse blew out on 2d rotary
Machine load factor — 54%

Station Efficiency 75%
Day Operator J. Crowley
Night Operator G. B. Sheppard
Chief Operator A. B. Clark
Chief Engineer

SUBSTATION RECORD, AUBURN & SYRACUSE ELECTRIC RAILROAD

The form of record which we use is illustrated in the accompanying figure on which it will be noted in addition to the usual energy readings, etc., a line is drawn to indicate the machine capacity in service, and another to show the direct-current load. The machine load factor, in per cent, and also the efficiency of station in per cent are calculated and entered on the record.

Our operators take pride in plotting their records neatly and are interested in the relative efficiencies of the several substations. They have also made many suggestions as to any change in service to permit them to load the machines more efficiently.

To illustrate the nature of these suggestions, I recall that the operator at Skaneateles substation mentioned the fact that if the Russell snowplow was spaced a certain distance from a passenger car he would be able to handle the service with one rotary instead of two. Such suggestions as this which are constructive are immediately adopted and the operator is given due credit for them.

It is decidedly important that the transportation department give the substations all information possible regarding any change in service. This is particularly applicable to interurban operation. Our transportation men call up the substations whenever any extra cars, snow-fighting equipment, etc., are on the road, and thus prepare the operators to anticipate the time and duration of a peak.

Before the wattmeters and log sheets were placed in service it was a frequent occurrence that two 400-kw. rotaries in the interurban substations were run where one machine is now handling the service. As a matter of fact, after a graphic record was kept, the load at Skaneateles substation, which was formerly at some periods handled by two 400-kw. rotaries, was found to be just a well-balanced load for one modern 300-kw. machine. It is probable that the installation of such a rotary in this station will permit the handling of the load and, through its increased efficiency over the old-style 400-kw. unit will soon pay for itself.

As a result of the conforming of machine capacity in service more closely to the load we have secured the following improved substation efficiencies:

Substations	Average Efficiency, Per Cent December, 1916	 January, 1917
Auburn	90	93
Skaneateles	70	79
Howlett Hill	68	78

The difference in efficiency between the Auburn substation and the interurban substations is mostly accounted for by the fact that energy is purchased and measured at the low-tension alternating terminals of the rotary converter at Auburn and at the high-tension terminals of the transformers at the interurban substations. In other words, the percentages at Auburn do not include static transformer loss while those at the other substations do include it.

The average machine load factor at the city substation has been increased to 63 per cent and the interurban substations to 51 per cent.

The following data of kilowatt-hours per car-mile furnish an indication of the material energy saving which has resulted from the campaign for more efficient substation operation:

Kilowatt-Hours Per Car-Mile

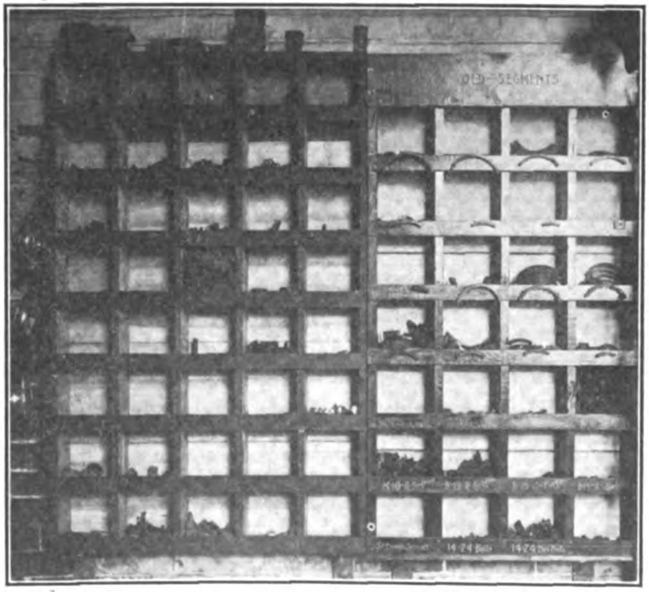
December, 1915	December, 1916	January, 1916	January, 1917
4.21	3.82	4.08	3.80

The decrease in kilowatt-hours per car-mile was made in the face of the fact that more ton-miles were operated in the December, 1916, and January, 1917, than in the preceding months mentioned.

It is estimated that the cost of three direct-current watthour meters, which was approximately $700, was saved during the first two months of operation. Inasmuch as the operators plot the records themselves there is no need for an increase in the clerical force, and the only added expense was the cost of the record forms.

Method of Reclaiming Old Controller Segments

In the shops of the Beaver Valley Traction Company, New Brighton, Pa., old controller segments which have been burned or otherwise damaged are saved and cut up into smaller parts. The illustration shows a rack which has been found convenient in working out this economy. The bin in the upper right-hand corner is the one into which the damaged segments are thrown when they are removed from the controller. When the bin is full the segments are cut up into the smaller sizes which are then sorted and placed in the boxes below. On the front of each box the class and catalog number of the part are given, and to make it easier to locate the part wanted, one of the segments is also fastened on the outside.

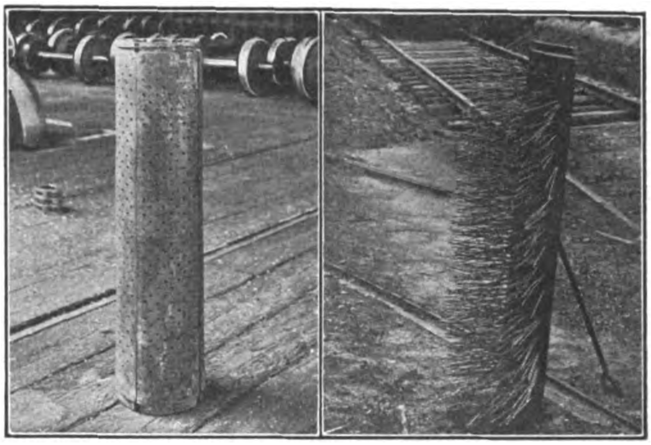


BIN FOR HOLDING CONTROLLER SEGMENTS

The bins on the left-hand side of the rack are used for holding carbon brushes and brush-holders. Trolley wheels are kept on pegs on the ends of the rack.

Steel Wire for Sweeper Brooms

The International Railway, Buffalo, N. Y., has during the last few months used steel wire in sweeper brooms instead of rattan and is much pleased with the results. The wires are held in a slit cast-iron shell, like that shown in the accompanying photograph, being cut in about 18-in. lengths, bent into U-form in a simple former and slipped through the ¼-in. holes which are drilled about 1½ in. apart over the surface of the shell. The wire is No. 11 gage and the copper-covered variety is used to prevent rusting. Each hole accommodates four wires and the wires are held in place by means of a sheet of No. 16 gage steel placed inside.



STEEL WIRED SWEEPER BROOM USED BY INTERNATIONAL RAILWAY, BUFFALO, N. Y.—CAST-IRON SHELL AT LEFT, ASSEMBLED BROOM AT RIGHT

Use of Air Tools in Rhode Island Track Work

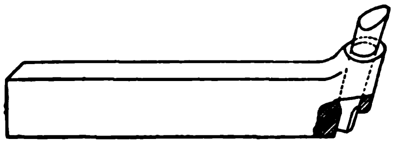
The increasing use of machine tools in road and track work is a feature of interest on the system of the Rhode Island Company. Among the recent additions to this class of equipment are eight "Imperial" tie tampers, supplied with air by two electrically driven Ingersoll-Sergeant compressors. The uses of these air tools are varied. The compressors are mounted on trucks running on standard-gage track and have been found especially convenient in cleaning up dirt and other debris in locations where new concrete has been joined to old, or in the pouring of concrete where the cement mixture is to abut against iron or steel beams, and in cleaning bridge construction. Each tie-tamping machine requires about 16 cu. ft. of air per minute at 80-lb. pressure, two machines operated together taking about as much air as a pneumatic riveting hammer. The use of the air tamper results in greatly increased thoroughness of work, especially in handling crushed stone.

In thawing out ground for winter construction the company uses Hauck torches with nozzles about 6 in. in diameter, the air supply being obtained from the Ingersoll-Sergeant compressor outfit. Eight of these torches are now listed in the department's equipment, and their use in connection with street excavation in frozen ground has been remarkably successful. Municipalities are becoming more and more averse to the use of fires on the streets, with resulting spark and smoke troubles, delay to traffic, etc. The concentrated heat of these torches enables the ground to be thawed far more rapidly than with a fire, and practically eliminates traffic delays, besides doing away with sparks and smoke. In thawing out ground for work in connection with carhouse construction this winter, the Ingersoll compressor was used in connection with Hauck torches.

and lumps of frozen earth, 2 ft. to 3 ft. in diameter, were easily detached. A jack-hammer drill of Ingersoll make was successfully used in frost removal, holes in 2-ft. to 4-ft. squares, and spaced from 4 in. to 6 in. apart inside, being drilled in the earth. Another useful application of the air compressor is in blowing sand as fast as it is dried to the end of a heating pipe or cylinder. Air-operated hoisting is employed on a crane car used in the department.

Drill Stubs Made Into Lathe Tools

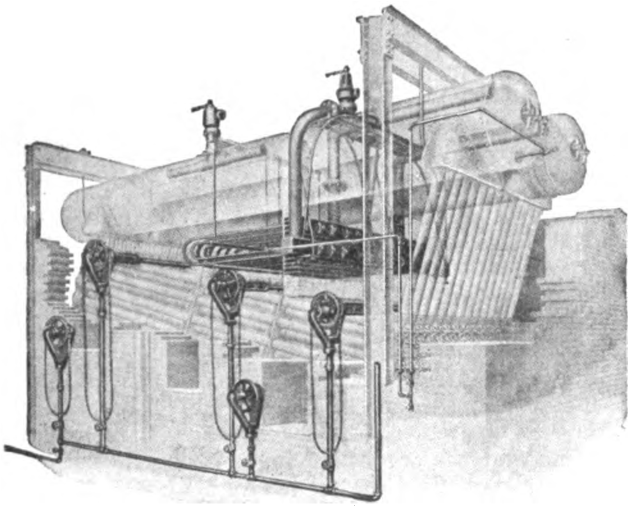
A use to which drill stubs can be put has been suggested by the Cleveland Twist Drill Company. In order to use up this valuable high-speed steel, the company cuts off the stub end of the drill, hardens it and grinds it to form a lathe tool. This is slipped into a tool holder as shown in the accompanying sketch, and it works as well as any manufactured lathe tool.



LATHE TOOL WHICH USES DRILL STUBS

Soot Blower Facilitates Economic Boiler Operation

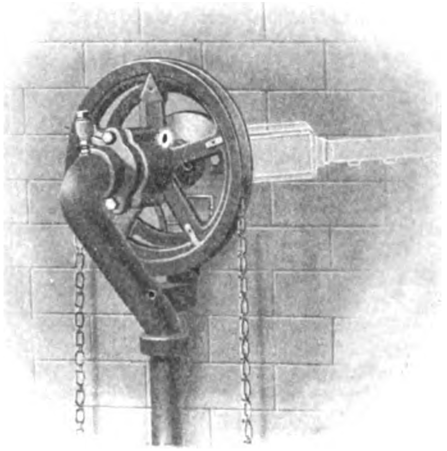
The formation of soot on the fire surfaces of a boiler is one of the most troublesome sources of preventable waste in the boiler room. Other losses, such as air leakage, incomplete combustion, improper insulation and scale formation, can be eliminated permanently or corrected at infrequent intervals without great difficulty. The formation of soot, however, cannot be stopped by any permanent means. Its deposit on the fire surfaces of a boiler is a continuous process. It forms an injurious heat insulator, which in non-conducting properties has proved to be more than five times as effective as fine asbestos.



SOOT BLOWING SYSTEM ATTACHED TO HORIZONTAL WATER-TUBE BOILER, SHOWING FIVE SOOT BLOWING UNITS

The losses which result from soot formation on the tubes are considerable as indicated by the following: With coal at $3 per ton, and 1/32 in. of soot on the tubes, a loss of 29 cents per ton of coal results; with 1/16 in. there is a loss of 66 cents per ton; with ⅛ in. of soot, $1.45 per ton; and with 3/16 in. of soot, $2.07 per ton.

From these figures it would seem that some effort to clean the soot from the fire surfaces of a boiler is almost essential. The Diamond Power Specialty Company of Detroit, Mich., has for several years been developing and manufacturing mechanical soot blowers of which its latest product, the model "G" unit for use on water tube boilers, is illustrated herewith. The Diamond mechanism for cleaning soot from the tubes is made up of a series of units, each of which consists of five different elements as follows: (1) A head through which the steam passes from the main soot blower supply line when the valve is opened and which forms the foundation element to which the others are attached; (2) A wall box which is bricked into the setting to support the unit and so constructed that the blower can be turned freely without admitting air to the furnace; (3) A blower element running cross-wise of the bank of tubes and consisting of a small header with nozzles placed to discharge steam vertically between the boiler tubes; (4) A sheave or hand wheel which is used to rotate the blower element; and (5) The bearings which support the blower elements and permit them to revolve freely.



HEAD OF SOOT-BLOWER UNIT, SHOWING GOOSE NECK AND HAND WHEEL

Another feature is the use of steam nozzles designed like a Venturi tube, by means of which steam is discharged, it is claimed, at three times the velocity possible with a straight nozzle, with the same pressure and size of aperture. The use of a gooseneck of special design, and of air inlet valves which prevent furnace gases from being drawn into the blower piping when the steam is shut off and a partial vacuum created, are considered to be important features of the design of the blower.

This system of cleaning boiler tubes is claimed to effect a saving of from 4 to 8 per cent in fuel and an increase in boiler efficiency of from 4 to 8 per cent. Also, a considerable labor saving, an increase in the length of service of boiler flues through prevention of corrosion, and a saving in the steam used for cleaning, are claimed for the device.

Results of Tests Made on Oil-Burning Boilers

Tests have been made by the superintendent of power, Pacific Gas & Electric Company, on the efficiency of the soot-blowing apparatus installed in the two 822-hp., oil-burning Sterling boilers at Station A. As shown in the following test results, the temperature of the gases in the stack was decreased 69.25 deg. Fahr. (13.05 per cent) and the temperature of the superheated steam increased 3 deg. (0.6 per cent) by cleaning the tubes. Calling the efficiency of the boilers 70 per cent, this means a saving in fuel of 3.9 per cent due to dusting.

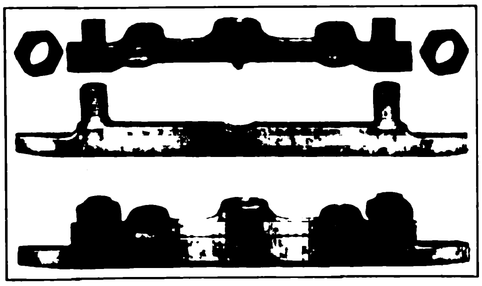
	Before Using Soot Blowers	After Operating Soot Blowers
Load meter	4.075	4.175
Per cent rating	101.88 per cent	104.38 per cent
Steam pressure	199.5 lb.	200.75 lb.
Superheated steam	499.5 deg. Fahr.	502.5 deg. Fahr.
Stack temperature	553 deg. Fahr.	483.75 deg. Fahr.

The soot that accumulated on the tubes of the oil-burning boiler was a sticky, gummy substance which clung with great tenacity to the tubes.

The Columbus Railway, Power & Light Company, Columbus, Ohio; the Toledo Railway & Light Company; the Sheboygan Railway & Light Company, Sheboygan, Wis.; the Detroit (Mich.) United Railway Company; the General Electric Company, and the Westinghouse Electric & Manufacturing Company, are companies in the electric railway field which have the Diamond soot blowers either in use or specified for plants now under construction.

Strain Trolley Ear Which Requires No Soldering

A mechanical strain trolley ear which can be fastened to the wire without the use of a soldering torch for iron has been put on the market by the General Electric Company, Schenectady, N. Y. As shown by the accompanying illustration, the ear consists of two parts, a runner shoe which holds the wire, and the body portion of the ear which bolts onto the runner and clamps the wire into it at the same time. The runner shoe is made of malleable iron or composition metal and is renewable, being easily replaced when worn out. By the use of this ear the detrimental effect which results from overheating an ear when soldering is avoided.



TWO PARTS AND ASSEMBLY OF SOLDERLESS TROLLEY STRAIN EAR

Powdered Metals Used for Rust-Proofing

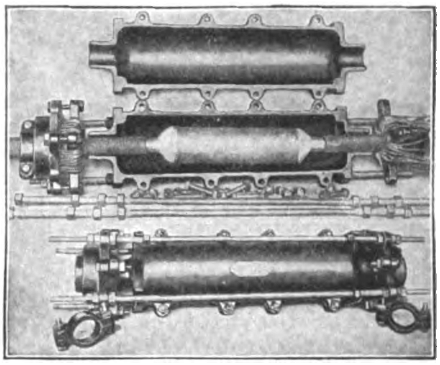
A new rust-proofing material and process called "Epicassit" has just been introduced by Hess & Son, Philadelphia, Pa. The material itself consists of a powdered metal, usually either tin, lead, zinc or their alloys. These are mixed with a suitable fluxing carrier to the consistency of a smooth, creamy paint which is evenly applied to the well-cleaned article. Heat is then used to melt the coat down.

The cold paint may be applied with the brush just like ordinary paint, or the article may be dipped into it, drawn through it, or tumbled into it. Heat may be applied in any way which is most convenient. Cold painted articles may be placed on shelves or on racks in an oven, similar to an enameling oven. Small articles may be placed in heated tumblers that are stationary, until the coating is melted down and are then tumbled to prevent sticking. Tanks, etc., that are built up of leaded or galvanized sheets and that are too large to be dipped are rust-proofed where exposed by applying the protective coating with a brush and melting it with a blow torch.

Joint Box for Submarine Cables

A new and improved type of joint-box or housing for use on submarine cables has recently been developed by the Standard Underground Cable Company, Pittsburgh, Pa. It has been successfully used on submarine cables of the Wilmington & Philadelphia Traction Company and Pennagrove Light, Heat & Power Company for crossing the Delaware River at Wilmington, Del. It was also used in Canada on submarine cables of the Halifax Electric Tramway.

The joint box is so designed that all mechanical stresses resulting from the action of tides, currents, and the like, that usually tend to damage the cable at these points are taken off the joint proper by long take-up rods. These rods are parallel to the cable and thus transmit the stresses to the steel wire armor, to which the rods are rigidly connected by heavy iron clamps on each side of the joint. This construction is shown in the accompanying illustration.



BOX FOR PROTECTING SUBMARINE CABLE JOINTS

As submarine cables even under normal conditions are subjected to severe mechanical stresses and have heretofore often failed first at the joints, this new device offers a solution for a serious problem in submarine cable laying.

Air Drills Reduce Breakage in Tearing Up Brick Pavement

Two 25-lb. plug drills, supplied by a single-stage 15-hp. Sullivan air compressor, are being used by C. F. Crowley, commissioner of public works of Troy, N. Y., in tearing up brick pavements. The outfit also includes a hand brushing tool which cleans the brick after they are removed. Breakage is much less than by the old hand method and the cost of removing and cleaning the brick has been greatly reduced, amounting to $5.96 as compared with $24 per 1000 brick.

Old pavements can be torn up at the rate of 4 sq. ft. in fifteen minutes, one or more brick being pried up at a time as desired. With the new outfit, including oil, gasoline and the wages of four workmen, the cost of removing and cleaning an average of 2000 brick per eight-hour day is $11.91, which is much less than formerly when the removal and cleaning of 1000 brick per day required ten men at a cost of $24. Since the adoption of this method 767,000 brick have been cleaned with an estimated total saving to the city of $13,810, or at least seven times the cost of the original equipment, which is still in good condition.

Employees of the Union Traction Company, Anderson, Ind., have formed a mutual protective association for the payment of sick and accident benefits.

News of Electric Railways

Traffic and Transportation

Financial and Corporate **Personal Mention** **Construction News**

Council Approves Cincinnati Lease

Electors of Cincinnati to Vote on April 17 on Ordinance for Leasing New Rapid Transit Loop to the Cincinnati Traction Company. Summary of Lease Provisions

The City Council of Cincinnati, Ohio, passed an ordinance at a special meeting on March 14, which provides for the lease of the proposed rapid transit loop to the Cincinnati Traction Company, which operates the Cincinnati Street Railway, and establishes new conditions for the company itself. There was only one dissenting vote. This ordinance will be submitted to a vote of the electors of Cincinnati on April 17.

The ordinance authorizes the Cincinnati Traction Company to operate the loop until April 21, 1946, and provides that the line shall follow substantially the course described in the ELECTRIC RAILWAY JOURNAL some months ago. The terms of the franchise thus granted for both the surface lines and the rapid transit loop may be revised at the end of fifteen years from April 22, 1916, and every fifteen years thereafter. The operation of the loop is to begin as soon after completion as power connections can be made and proper equipment installed. Provision is also made for the operation of a portion of the loop, when completed, if the Rapid Transit Commission believes this can be done to advantage.

INTERURBANS TO USE LOOP

Provision is made for the use of the loop by interurban and other electric railways upon terms to be agreed upon between the companies. It is also specified that the roads which use the line shall interchange traffic. All contracts of this kind are to be subject to the approval of the commission. In case of disagreement as to terms, the matter is to be referred to the commission. Should the local company refuse to accept the terms made by the commission, the question is then to be referred to a court of competent jurisdiction. In the meantime, however, the interurban company may use the tracks subject to the provisions as ultimately fixed. The company may defend only on the charge that the terms are not considered proportionately equitable.

The loop is to be operated in connection with the existing surface lines and such extensions and changes as are made in the future. All improvements or extensions on surface lines must be made in compliance with the city ordinances and with the approval of the proper city authority.

The ordinance reserves to the city the right to control the service on both the surface and loop routes, including schedules, routes and routes of interurban cars, transfers and the various other items that go with such control. It may order changes in routes, the construction of extensions, etc., but care must be taken that such changes do not prevent the earnings from becoming too small to yield a return on the capital invested. An appeal may be taken from any order of the city or the commission to a competent court, but the only cause that can be alleged is that the conditions sought to be imposed may prevent a proper return on the investment.

STREET RAILWAY COMMISSIONER PROVIDED FOR

A street railway commissioner is to be appointed by the Mayor, with the approval of the commission. The salaries and expenses of this office are to be borne by the city. The commissioner is to be the technical adviser of the city.

The company is to issue transfers on both the surface lines and the loop which will enable passengers to reach their destinations by the most direct route, or routes. Transfers will be good for five minutes after reaching the transfer points and no transfer is to be issued that will enable a passenger to return to the vicinity of the point of starting. Rules governing transfers are to be posted in the cars.

Within the city limits the Cincinnati & Hamilton Traction Company's road, leased to the Ohio Traction Company, is to be operated as a portion of the regular city transportation system. This will give the people along the line the city fare and service. Receipts from this line are to be accounted a part of the gross receipts of the operating company, but nothing is to be done to prevent the operation of interurban service on the road.

FIVE-CENT FARE PROVIDED

The rate of fare for adults is to be 5 cents, with free transfers. Children under ten years of age are to be carried for a cash fare of 3 cents, or two children traveling together for one fare of 5 cents, subject to transfers in both cases. Babies in arms are to be carried free. Inclined plane railway tickets are to be sold at the rate of ten for 25 cents.

There is to be an annual payment of $416,000 as return on the captial invested. The city is to retain its percentage tax, which is to be $325,000 a year after the present year. The 1917 tax is specifically divided into payments. For rental on the rapid transit loop the company is to pay an amount equal to the interest and sinking fund on the bonds required to build it. After the retirement of any of these bonds the proportionate amount shall be paid to the city. The company must also pay one-half of the rental on that portion of the Miami & Erie canal which is used for loop purposes.

In order to produce an amortization fund to aid the city in purchasing the property, the company is to pay to the city not less than $120,600 a year, until the payments with accumulated interest equal $5,000,000. This amount is to be paid to the company and the price to be paid by the city for the property is to be reduced accordingly. However, the payments allowed for return on investment are then to be reduced to $116,000 annually thereafter. Should the city decide to purchase the property before the sum reaches this amount, the fund, whatever it may be, is to be used as a partial payment.

All payments provided for are to be cumulative, and if the receipts for any one year are not sufficient to take care of the payments, the balances are to be paid the next year, before any other payments are made. If there is a balance after making all the payments, it is to be divided, 55 per cent going to the city and 45 per cent to the Cincinnati Traction Company.

CITY MAY ACQUIRE ALL PROPERTY FOR $26,238,950

The city reserves the right to acquire all the property of the company at a fixed price of $26,238,950, plus an amount necessary to discharge the reducible debt, if that has not already been done, or any refunding of the debt, plus such an amount as may be necessary to retire at the date of purchase the outstanding securities subsequently issued, minus the amount at the time of purchase in all reserve, depreciation and insurance funds accrued after Jan. 1, 1917, and in all sinking funds accrued after Jan. 1, 1917, for such securities as are now outstanding, and in all sinking funds for such securities as are issued hereafter, and minus $5,000,000, if the aforesaid amortization fund has been paid, and minus a sum equal to the aggregate amount of payments made and judgments satisfied for injuries to or death of persons or damages to property after Jan. 1, 1917, in liquidation of injuries, death or damages occasioned prior to that date. The city will assume these obligations.

By the acceptance of this ordinance, the company agrees to sell the property to the city at the price named whenever the city sees fit to purchase it. The company is to furnish a bond of $250,000 for the faithful performance of its duties under this ordinance.

The agreement is signed by the Board of Rapid Transit Commissioners, the Cincinnati Street Railway, the Cincinnati Traction Company and the Ohio Traction Company. The ordinance itself is signed by the proper city officials.

Public hearings will be held on the grant at once.

City to Issue $6,000,000 of Bonds

In order to construct the loop line, the city must issue altogether about $6,000,000 in bonds. It is the intention to acquaint the people with just what they are paying for in the issue of the bonds and endeavor to show them where the city will gain by providing an entrance for the interurban cars.

Charles L. Henry, president of the Indianapolis & Cincinnati Traction Company, was present at the last conferences on the ordinance and stated that the completion of his road to Cincinnati depended upon the approval of the loop plan by the people of Cincinnati.

During the period in which data were being collected and preparations for drafting the ordinance were being made, thirty-three public meetings were held by the Council committee on street railways and fourteen public meetings were held by the conference committee, consisting of two members each from the Council committee and the Rapid Transit Commission.

Washington Conditions Normal

Washington Railway & Electric Company Fast Restoring Full Schedules and Building Up New Organization

There was little to indicate on March 22 that a strike was in progress on the lines of the Washington Railway & Electric Company, Washington, D. C. On that day the cars were well filled, the midday schedule exceeded normal and the rush schedules attained 80 per cent of the standard service. There were no policemen on the cars and only one bored officer was found standing in front of the P Street carhouse.

On the day in question Clarence P. King, president of the Washington Railway & Electric Company, was quoted to the effect that the real issue in dispute was not a question of wages but whether the company should be forced to enter into a contract with the Amalgamated against the wishes of its loyal employees. He reaffirmed the statement that trainmen formerly in the employ of the company and on strike were returning to work daily and taking their old positions on the cars. That this was so is borne out by the statement previously made in regard to the restoration of service to practically normal condition.

A statement made by the company on March 20 referred to the notice posted at all carhouses defining the status of conductors and motormen and referred to the terms of the individual contracts noted in the Electric Railway Journal of March 17. The signing of individual contracts was not made compulsory, but trainmen returning to work who failed to sign the contracts received the old wage scale. The company pointed out that the individual contract provided against strikes, but did not prevent any employee from resigning as an individual at any time if he desired. The company expressed the opinion that a public service corporation whose duty was to furnish uninterrupted and efficient service to the public should not be placed in a position where its employees may strike or quit work in a body without regard to public convenience. The management said that it was agreeably surprised at the large number of new applicants for work and expressed confidence that it could build up its permanent organization quickly. In concluding its statement the company said:

"The company feels that the strike is over for the reason that it is able to operate adequate service, and disorders and damage to its property have about ceased. The only thing now remaining to do is to build up a permanent organization, which is being done and will result in enabling the company to maintain discipline and render a much more efficient service than it has under the intolerable conditions that have existed the past year."

The company, on March 22, placed advertisements in the Washington newspapers warning "all persons against committing or doing any act or thing that amounts to a boycott directed against the company." A statement was also issued by the legal department of the company in regard to the liability which attaches to any boycott.

Municipal Plant May Be Abandoned

Toledo Railways & Light Company Will Likely Supply Electric Service to Monroe

It is expected that within a short time the Toledo Railways & Light Company, Toledo, Ohio, will be supplying electric service to Monroe, Mich., under a thirty-year franchise. The city now has a municipal plant, but it was found that it would require large expenditures to enable it to care for the business, so a special committee of the Council was appointed by the Mayor to investigate the proposition as to whether it would be advisable to finance the municipal plant, or negotiate with the Toledo Railways & Light Company and the Detroit Edison Company for the supplying of electricity to the community. After going over the matter thoroughly, the committee has now unanimously recommended the sale of the municipal plant and the granting of a franchise to the Toledo Railways & Light Company. This recommendation must be ratified by a special vote of the people.

Monroe, the county seat of Monroe County, Mich., is situated a few miles away from Lake Erie, 25 miles northeast of Toledo, and 75 miles southwest of Detroit. It has a population of about 7500. The Toledo Railways & Light Company already has some consumers in Monroe which are supplied through a line connected to the city. At present the municipal plant has 1100 customers, including some large power consumers, and as the territory is virgin the Toledo Railways & Light Company anticipates a large future business.

St. Louis Compromise Postponed

Proposal of United Railways to City for Settlement of Differences Goes Over After Four Months of Consideration by the City

Action by the city of St. Louis, Mo., on the proposed compromise with the United Railways was deferred at a meeting of the public utilities committee of the Council on March 14 until the next session of the Board of Aldermen. The committee has had the compromise before it for about four months. One of the reasons given for delaying action until the new board meets is that Eugene B. Gregory, chairman of the committee, was beaten for renomination in the recent primaries, and that the present committee would be unable to complete a compromise plan in the few remaining weeks of this session.

A committee of directors of the United Railways proposed to the city last November that the city cease its attacks upon the company, reduce the mill tax, and allow payments of the tax now overdue to be made in installments. The company said it would acknowledge the legality of the mill tax, and cease resisting payment in the courts.

The compromise was turned over to the public utilities committee of the Council for recommendation, but the matter was considered at only one or two meetings. In December what purported to be a compromise plan tentatively agreed upon by the committee was published in the St. Louis papers, but since then virtually nothing has been done to push along negotiations. This plan was said to include provisions for the reduction of the outstanding securities of the company, a division of earnings between the company and city, representation by the city on the board of directors, and a probable subway.

The new public utilities committee of the Council will not be able to take up the compromise until late in April or early in May.

Mr. Brush Before Committee

President of Boston Elevated Discusses Prospective Development Before Committee Considering Report of Commission Which Inquired Into Company

The prospective development of the Boston (Mass.) Elevated Railway system, treated purely as a problem in railroading, was discussed by Matthew C. Brush, president of the company on March 12 before the committee on metropolitan affairs of the Massachusetts Legislature. Mr. Brush said that due to the peculiar layout of the downtown district of Boston, the practice of endeavoring to run surface cars through the business districts from each and every outlying locality was manifestly impossible. Duplication of rapid transit and surface service for the same purpose was prohibitive from the standpoint of expense, and in addition was poor railroading. Efforts should be made to curtail surface car operation which duplicated rapid transit service, with eventual discontinuance of surface car service in certain narrow and crowded streets. The principle of a loop or distributing line to be touched by all radiating lines and covering as much of the business district as possible was sound, and must eventually be necessary for providing proper transportation facilities.

SUBWAYS FOR TRAINS ONLY

Mr. Brush stated that the time had come when subways, to be handled to the utmost financial and traffic advantage, must be exclusively used by trains rather than by single car units. The proposed loop train service would enable the community to reap the full advantage of the East Cambridge Viaduct and would afford ample facilities for transfer between cross-town and north and south lines. At present 102 cars an hour were run through the Boylston Street subway in Boston, whereas with ten-car train service on a 1.5-minute headway, 400 cars per hour could be run. The Boylston Street subway would be exceedingly costly to extend downtown and it should not be constructed until the traffic demanded it.

An extension of the Dorchester tunnel to Upham's Corner was not justified at this time. It was planned to open the tunnel from the South Station to Andrew Square in the fall of 1917. The Boston Transit Commission should be asked to consider the possibility of using the Midland Division of the New York, New Haven & Hartford Railroad in connection with further rapid transit extension. Mr. Brush also pointed out the possible eventual extension of the Boylston Street subway into the wholesale district, with a tentative ultimate destination in the vicinity of Post Office Square. Mr. Brush urged third-track construction in reservations where feasible, for the use of rush-hour express trains. He recommended the installation of a third track between Kenmore station in the Back Bay and the junction of Commonwealth and Brighton Avenues, Allston, at an outlay of about $100,000, the distance being about 7000 ft. Mr. Brush announced that it was the intention of the company to complete the Everett elevated extension as promptly as possible, thereby releasing a substantial number of surface cars and improving the service to that city and to Malden.

CRUX OF THE BOSTON FARE PROBLEM

Mr. Brush did not believe that the criticism of hauling passengers from Arlington Heights to West Roxbury, 14, 16 or 18 miles was a serious problem, because the number of people who rode that distance was negligible. The man that the company hauled 300 days a year into Boston, 8.5 miles, and out again at night, was, however, a mighty serious matter, because the short-haul rider was really the man who paid the fare of the long-haul man. It was a financial impossibility to haul a man 8 miles for a nickel. It never could be done, and it was less likely to be done now than ever before.

The distance that passengers could ride was not ordinarily appreciated, and the gradual development of the outlying districts due to the construction of rapid transit thoroughfares had tended to increase the average ride. Mr. Brush submitted the following table showing the extent to which lines run out beyond the city to points beyond which passengers could not be carried for 5 cents without loss to the company:

Route	Miles
Post Office Square to Milton Lower Mills	6.08
Milk Street to Mattapan	6.82
Milk Street to Milton Lower Mills via Forest Hills	7.76
Milk Street to Dedham line	8.77
Milk Street to Charles River, Needham line	9.18
Park Street to Watertown via Brighton	7.11
Park Street to Arlington Heights	8.66
Summer Street to Middlesex Fells	7.89
Summer Street to Broadway, Malden	7.88

These are all regular rides, 300 days in the year.

Under the Milwaukee zone system, the fare from Mattapan to the city would be cash 9 cents, tickets 7.33 cents; Germantown, cash 15 cents, tickets 10.65 cents; Newton Corners, cash 9 cents, tickets 7.33 cents; Arlington Heights, cash 13 cents, tickets 9 cents; Middlesex Fells, cash 9 cents, tickets 7.33 cents, and other points in proportion. In conclusion, Mr. Brush reiterated his views regarding the transfer abuse in Boston, and pointed out that if the company received legislative authority to raise the money it would immediately contract for additional surface cars of the latest type to replace older equipment. He also discussed the recent rolling stock orders of the road, and briefly pointed out the great margin in the purchasing power of the passenger's nickel at Boston over other large cities of the United States.

Doherty Men Meet

Men Connected with the Doherty Railway Properties Adopt Definite Recommendations

Certain definite recommendations for the operation of Doherty railway properties were adopted by the committee which convened in St. Joseph, Mo., on Feb. 8, 9 and 10. These recommendations are the outcome of suggestions put forth in papers read at the general gathering of Doherty railway men in Toledo during the last year. At that time a committee was appointed to review these recommendations with a view of their possible adoption for the railway properties. Track and paving problems were discussed and detailed recommendations drawn up. Advertising of railway facilities was reviewed as well as the advisability of starting a new-business department in conjunction with Doherty companies with a view of getting in closer touch with the riding public.

Financing of railway properties was another subject that received considerable thought and certain steps are being advised in this connection. A standard classification of all accidents on railways was presented and adopted by the committee.

Representatives of the Ohio Brass Company gave a practical and interesting demonstration before the gathering in the matter of bonding of rails.

Henry L. Doherty was present at the meeting on Feb. 10, and spoke on welfare work. Mr. Doherty approved of the methods used at St. Joseph in this regard, and stated he was in entire accord with any similar associations that might be organized in other properties.

At the close of the committee gathering it was suggested that a general railway meeting be held in Toledo just prior to the convention of the American Electric Railway Association at Atlantic City in October.

References to Working Hours

The library of the Bureau of Railway Economics, Washington, D. C., has compiled, under date of Jan. 17, a list of references relating to the eight-hour working day and to limitations of working hours in the United States, with special reference to railway labor. This is supplementary to a similar publication of the Library of Congress in 1908. The new list does not include references to literature on the trainmen's wage controversy of 1916 or the Adamson act, except as such literature relates to the eight-hour movement in general. Under date of Jan. 26, however, there has been prepared by the same bureau a special list of books and articles which deal particularly with the provisions of the Adamson law.

Sleet Damages Indiana Lines

Recent Tornado Followed by Storm Which Wrecks Overhead Lines

Following the tornado on March 11, which caused great loss of life and property damage in the city of New Castle, Ind., a terrific sleet storm swept across the central part of the State on March 12 and 13, resulting in serious damage to the overhead lines of the Union Traction Company of Indiana. The storm carried down nearly 200 poles on the Northern Division, between Tipton and Kokomo, together with the high-tension lines and all overhead wires. Service on this line was interrupted until noon on March 16. Between Muncie and Hartford City about 150 poles were blown down, between Alexandria and Marion approximately 100 poles, and in the city of Marion all the pole lines were down on Washington Street from Thirteenth Street to Twenty-sixth Street, a distance of thirteen blocks. Lesser damage was done on other parts of the system. Service was restored on all lines except the Tipton-Kokomo section of the Northern Division on March 14. A large force of linemen was immediately put at work erecting the temporary lines, and the work of putting up the new permanent construction is now well under way. It is estimated that the property damage due to this sleet storm is between $20,000 and $25,000.

Progress of Franchise Resettlement

The officers of the San Francisco-Oakland Terminal Railways, Oakland, Cal., have made formal application to the City Councils of Oakland and Berkeley for a resettlement of the various street railway franchises owned by this company in these cities under the terms of the plan outlined in the ELECTRIC RAILWAY JOURNAL for Nov. 18, 1916. A similar application will be made in the city of Alameda as soon as the new charter authorizing such application has become effective. These steps are being taken as promptly as possible after the ratification by the State Legislature of the refranchise plan as approved in the three cities. The situation has been simplified by the fact that the State Railroad Commission has completed its valuation of all the property of the San Francisco-Oakland Terminal Railways. The city charter provides for the organization of a board of control on which the city and the franchise grantee shall both be represented, which board of control will supervise the adjustment from year to year of the basic valuation established in the franchise by adding thereto the costs of extensions, additions and betterments approved by the board and subtracting therefrom the book value of property sold or abandoned and depreciation as established by the board.

Chicago Transit Considered

Local Committee Hears Proposals for New Transportation Systems—Thirty-Twenty Year Grant Also Considered

The local transportation committee of the City Council of Chicago, Ill., on March 16 had a hearing for the formal presentation of the Jackson and Jarvis Hunt transportation plans. The latter of these was briefly described in this paper for March 10, 1917, and comprised principally the use of monorail cars in an elaborate subway and overhead system. At this meeting, Walter Fisher, counsel for the committee, asked Mr. Hunt to present to the committee comparative operating costs of the monorail and ordinary railway systems in Germany.

The Jackson plan, as presented, comprises an independent subway north and south on Halsted Street from Seventy-ninth Street on the south to Wilson Avenue on the north, with a loop running under Jackson Boulevard to State Street to Washington Boulevard and back to the main subway line on Halsted Street, to take care of the Loop transportation. This plan involved the building of a low-level subway which Mr. Jackson considered much more suitable to Chicago conditions. Such a subway he said, could be built for one-third less than the high-level subway proposed by the Chicago Traction & Subway Commission. The cost figure submitted by Mr. Jackson did not include any equipment in the subway, or rolling stock, and upon questioning by Mr. Fisher, it was soon brought out that no provision had been considered for forcing the present transportation companies to occupy such a subway, and that if operated independently as planned, it would involve the paying of a 5-cent fare on this subway and another 5-cent fare when changing to any other transportation system. Neither the Jarvis Hunt nor the Jackson proposition was accompanied by a request for a franchise.

On March 17 the committee had a public hearing on the thirty-twenty year franchise bill. The time was consumed by W. J. Kerr, an attorney, who attacked the amortization feature of the bill, and by George Sikes, a municipal ownership advocate. The latter was opposed to this form of franchise or any other form other than those held by the companies at present, since the possibility of municipal ownership within ten years, which he expected, would be hampered by the granting of any new franchise rights.

The hearing on franchises was continued on March 20, but no great interest in the matter was manifested by the public.

Capital Traction Agreement

The agreement of the Capital Traction Company, Washington, D. C., with the representatives of Division 689 of the Amalgamated Association of Street & Electric Railway Employees, under negotiation as noted in the ELECTRIC RAILWAY JOURNAL of March 17, was signed on March 20. It will run until March 20, 1920. The agreement provides for a minimum wage for motormen and conductors of 25 cents and a maximum of 30 cents. The present scale ranges from 23 cents to 27 cents. It formerly took ten years to reach the maximum. Under the new agreement the maximum can be attained after six years. The wage rate for motormen and conductors follows: First year of service, 25 cents an hour; second year, 25½ cents an hour; third year, 26 cents an hour; fourth year and fifth year, 27 cents an hour; sixth year, 28 cents an hour; seventh year and over, 30 cents an hour. The agreement with the company was ratified by the men at two meetings of the employees held on March 19.

The outstanding features of the agreement between the Capital Traction Company and its employees follow: No discrimination on either side. Grievances to be settled by conference with the District Commissioners acting as final arbitrators, both parties recognizing the interest of the public as a vital factor. Provisions as to the makeup of runs. Increases in wages from 1 to 3 cents, and attainment of maximum wage at the beginning of the seventh instead of the tenth year. The contract to run for three years, but wage adjustment may be made annually under definite provisions which do not reopen the contract as a whole. Men on the extra list to be paid half rate while on bench duty. Increases ranging from 15 to 25 cents a day for employees other than trainmen.

Plan Outlined for Montreal Subway.—Comptroller Ross explained to the Montreal (Que.) tramway commission recently a plan for the construction of subways in Montreal to serve Westmount, Verdun and the east and north ends of Montreal. The plan as outlined by Mr. Ross provides for about 12 to 15 miles of line.

One Cent an Hour Advance in Philadelphia.—The Philadelphia (Pa.) Rapid Transit Company made the following scale of wages effective on March 1: new men, 28 cents an hour; after first year, 29 cents an hour; after two years, 30 cents an hour; after three years, 31 cents an hour; after four years, 32 cents an hour; after five years, 33 cents an hour. This is an advance of 1 cent an hour in all grades.

Electrification Bill Defeated.—The committee on cities of the Minnesota House has recommended for indefinite postponement the bill for the electrification of the Northern Pacific Railway in St. Paul from Chestnut Street to the Minnesota transfer. Officials of the company and of other railroads contended that the cost of the work prescribed by the bill was wholly incommensurate with any advantage that would accrue to the city or the company through it being carried out at this time.

Proposed Philadelphia Contract Discussed.—Ellis Ames Ballard, counsel for the Philadelphia (Pa.) Rapid Transit Company, reviewed at a luncheon of the City Club on March

17 the program of transit development for Philadelphia which has received the approval at the polls of nearly three-fourths of the voters of the city, and discussed some of the objections that have been raised to the terms of the proposed contract under which his company would be willing to operate the lines when built.

Constabulary Measure Passes New York Senate.—The State police bill passed the Senate of New York on March 20 after prolonged debate. The vote was twenty-six to twenty-four. All the Democrats voted against the bill, and were joined by a number of Republicans. An amendment designed to subject the proposed bill to civil service regulations was lost by an adverse vote of twenty-seven to twenty-three. The bill, known as the Mills measure, will go into the Assembly, where it will be substituted for the Wells bill. It must, however, be referred to the ways and means committee first and then reported out.

Report Presented on Work on Cleveland Subway.—A report from the Cleveland (Ohio) Rapid Transit Railway was presented to the City Council on March 19. It explained the reason for the delay in expending $500,000 on construction work, as required by the franchise to the company. The report declares that the company has spent much time and considerable money on the project, and is in position to proceed with the construction work when the labor situation clears up and prices of materials become stable. The report was referred to the street railway committee for consideration. Councilman Kedelcek had prepared a resolution declaring the franchise forfeited, but delayed presenting it on receipt of the report.

I. T. S. Sues to Preserve Its Rights.—A suit to nullify ordinance No. 188, passed by the City Council of Venice, Ill., recently, wherein the franchise rights granted to the Illinois Traction Company under ordinances 114 and 115 were withdrawn, has been filed by the company in the United States Circuit Court at Springfield. The company seeks to prevent carrying out of the threats of tearing up the tracks of the company in Venice, made by the city officials following the ordinance repeal. The contention arose over the cancellation by the company of the 5-cent fare between all points in the Tri-Cities and St. Louis, and the substitution of the 10-cent fare authorized by the Interstate Commerce Commission. The case will be heard at Springfield on March 16.

More Strike Dynamiters Sentenced.—James J. Merna and William Molsky, members of Local 731 of the Amalgamated Association of Street & Electric Railway Employees of America, were sentenced by Justice Tompkins on March 19 to terms of from six years and six months to thirteen years and two months for participating in the attempt to blow up the 110th Street subway station, New York, N. Y., during the street railway strike last fall. J. J. Herlihy, financial secretary of the local, recently drew a term of from ten to twenty years for the same offence. Later he turned State's evidence. George Pollock, treasurer of the local, was acquitted of complicity in the crime on March 16. Thomas McGuire, a fifth alleged conspirator, was placed on trial on March 19.

Increase in Wages in Columbus, Ohio.—The Columbus Railway, Power & Light Company will on March 30 increase the wages of its motormen and conductors, establish a minimum weekly wage of $12, where extra men make all daily reports assigned them without a miss, and return about $6,000 which the men have on deposit for badges. The new scale, based upon the period of service, shows increases as follows: First three months, from 21 to 22 cents an hour; next nine months, 23¾ to 24½ cents; second year, 25½ to 26 cents; third year, 26 to 27 cents; fourth year, 26½ to 27½ cents; fifth year, 27 to 28 cents; sixth year, 28 to 28½ cents; seventh year, 28 to 29 cents; eighth year, 28½ to 29½ cents; ninth year and thereafter. 29 to 30 cents. This is the second voluntary wage advance to be made within a year.

Preparing to Pass Auto Traffic Bill.—The Knight-Welsh traffic bill, which provides for the uniform regulation of vehicles and pedestrians in New York State, has been amended at the hands of the Assembly committee on internal affairs, and was expected to be placed on the calendar in the lower house for final consideration during the week ended March 24. The measure has the indorsement of the cities of the State, the New York State Automobile Association, the New York State Motor Federation, more than 125 local automobile associations in cities and villages, the City Club of New York, the Citizen's Union of New York, the National Highways Protective Association, and the special committee appointed by the Public Service Commission of the Second District, to represent the electric railway managers and the automobile interests of the State.

Mobile Bonus Payment Restored.—The Mobile Light & Railroad Company, Mobile, Ala., has recently paid a bonus to its employees. The company formerly paid a similar bonus, but the business depression brought about by the war made it necessary for the company to retrench and it abandoned the bonus plan. As business has picked up the bonus has been restored. The company pays all of its motormen and conductors a bonus of 1 cent an hour for each hour they work, the bonus being distributed on the first days of January and July of each year, for the previous six months, and is paid to all motormen and conductors in service and those who have received an honorable discharge. If an employee has resigned at any time during the six months' period and his record is good and he has not resigned to avoid being reprimanded he secures the bonus the same as those still in the employ of the company at the dates mentioned.

Suit Threatened in Franchise Obligation Case.—An ordinance was introduced in the Council of Seattle, Wash., recently, providing for suit to be brought by the city of Seattle against the Puget Sound Traction, Light & Power Company, to compel payment of the 2 per cent tax on the company's gross receipts during 1916. When the company tendered its check for $64,387 to the city in January in payment of this tax, it did so under protest, and with the condition that the city should abandon legal proceedings to compel the company to pave its tracks with the same material used by the city on the rest of the street. The city declined to accept the check under the conditions attached, and it was returned to the company. The company contends that the obligation to pave its right-of-way is a provision of the franchise which it is seeking to have canceled by the Public Service Commission, and it refuses to fulfill the obligation until the hearing on its petition to the commission for relief from this requirement has been passed upon by that body.

Downtown Operation of Municipal Cars Proposed.—At a recent meeting of the City Council a plan to operate Lake Burien cars (Division C of the municipal line) over the tracks of the Puget Sound Traction, Light & Power Company, around the Columbia Street loop, was discussed and taken under advisement. Councilman R. H. Thomson questioned the advisability of increasing the monthly loss on the Lake Burien line. The plan proposed would not eliminate the double fare. The city would collect an additional fare between Riverside and the uptown terminus. The city cars would be operated on the lines of the Puget Sound Traction, Light & Power Company by the employees of that company. The advantage would be that the municipal cars from the Lake Burien line would be operated into the downtown district and no change of cars would be necessary for passengers to and from the end of the Lake Burien line. It has been estimated that under the plan proposed the cost of operation of the municipal line (Division C) would be increased from $14,464 a year to $17,680 a year, and to this would be added $2,200 additional expense for the construction of needed trackage at the Riverside end of the line.

Program of Association Meeting

American Society of Mechanical Engineers

The spring meeting of the American Society of Mechanical Engineers will be held at Cincinnati, Ohio, May 21-24. The meeting will open on May 21 instead of May 22, as previously announced. A feature of the spring meeting will be a joint session on May 22, with the National Machine Tool Builders' Association.

Financial and Corporate

Annual Reports

United Railways of St. Louis

The comparative income statement of the United Railways, St. Louis, St. Louis, Mo., for the twelve months ended Dec. 31, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Revenue from transportation..	$12,548,859	99.3	$11,589,488	99.2
Revenue from other railway operations	92,434	0.7	91,712	0.8
Gross operating revenue....	$12,641,293	100.0	$11,681,200	100.0
Current operating expenses...	$6,953,124	55.0	$6,837,982	58.5
Depreciation	1,516,955	12.0	1,337,309	11.5
Taxes	821,684	5.5	739,539	6.3
Total	$9,291,763	73.5	$8,914,830	76.3
Income from operation.......	$3,349,530	26.5	$2,766,370	23.7
Non-operating income	82,588	0.6	98,484	0.8
Gross income	$3,432,118	27.1	$2,864,854	24.5
Interest and miscellaneous charges	2,544,613	20.1	2,599,327	22.2
Net income	$887,505	7.0	$265,527	2.3

During 1916 the company carried more passengers than during any previous year in its history. The receipts, however, were slightly less than during 1913. If it had not been for the increased use of transfers, 1916 would have been the banner year in receipts as well as passengers. Owing to the smaller increase in expenses, etc., the net income showed a big gain.

The passenger revenue for 1916 was $12,518,817, an increase over 1915 of $1,002,951, or 8.71 per cent. Other transportation revenue decreased $43,580 on account of the cancellation on Nov. 1, 1915, of the contract with the United States Government for carrying mail. Revenue from other railway operations increased $722, and income from other sources decreased $15,895. Gross earnings and other income amounted to $12,723,882, an increase of $944,197, or 8.02 per cent over 1915.

Operating expenses (including depreciation) increased $294,788, or 3.61 per cent, and taxes increased $82,144, or 11.1 per cent. Interest charges decreased $54,712, or 2.10 per cent, owing to the retirement of $500,000 of Southern Railway 6 per cent bonds, $1,000,000 of St. Louis & Meramec River Railroad 6 per cent bonds, and $200,000 of Southern Electric Railroad 5 per cent bonds, and the purchase of various underlying bonds. Net income increased from $265,527 to a sum more than two and one-third times as much.

The amount of money paid out in wages was $4,270,187, or 33.78 per cent of the gross earnings. The average number of employees in the service of the company during the year was 5385. The total number of passengers carried during the last two years was as follows:

	1916	1915
Revenue passengers—5 cents..........	247,706,094	227,863,250
Revenue passengers—2½ cents........	5,340,492	4,908,140
Total revenue passengers............	253,046,586	232,771,390
Transfer passengers	136,065,566	124,043,205
Total passengers	389,112,152	356,814,595

The percentage of revenue passengers using transfers during 1916 was 53.77. and during 1915, 53.29, an increase of 0.48 per cent. The average fare per passenger was 3.22 cents in 1916, as compared to 3.23 cents in 1915. The passenger-car mileage in the two years was 43,568,964 and 41,986,215, and the total car-mileage 43,649,328 and 42,205,802 respectively.

During 1916 there was expended and charged to capital account for added property $283,420, as follows: Real estate, buildings, tools and fixtures. $116,951; track and roadway construction, $83,317; electric line construction, $30,612; power plant—buildings and equipment, $24,478; cars and electric equipment of cars, $29,416; and sale of material previously charged to capital account, $1,355. The total mileage on Dec. 31, 1916, was 458.73 miles, 2.99 miles of track having been added and 1.80 removed during the year.

In discussing future power requirements, the annual report of the company states that during 1916 the peak of the load was about 55,000 kw. A conservative estimate of the power required for 1917 is 6 per cent in excess of this peak, or a maximum of 58,500 kw. It is now necessary, it is said, for the company to consider seriously plans for its future power requirements. The large investment required for a new power plant, the problem of finance, the present high prices of labor and material, and the long deliveries demanded by manufacturers, point to the purchase of power as more desirable, if satisfactory arrangements for such purchase may be made.

Grosse Berliner Strassenbahn

The receipts of the Grosse Berliner Strassenbahn, Berlin, Germany, together with the street railway lines under its control, in December, 1916, amounted to $1,330,725, in comparison with an income of $1,127,405 in 1915. For the entire year 1916 the income of these lines was $14,127,775, as compared to $12,424,545 in 1915, an increase of $1,703,230. The average daily income was $38,700 in 1916, as compared to $34,000 in 1915. The Grosse Berliner Strassenbahn alone took in, in 1916, $11,371,910, as compared to $10,008,700 in 1915, $9,732,735 in 1914, and $10,586,970 in 1913.

On the underground and elevated railway the income in 1916 was greater than in any previous year, the returns in late years having been: 1913, $2,230,000; 1914, $2,404,850; 1915, $2,150,615; 1916, $2,464,930. On the other hand, the Berlin General Omnibus Company presented an unfavorable report, with an income of $1,130,005 in 1916 as compared to $1,485,315 in 1915. The monthly returns of this company show that the introduction on Oct. 1, 1916, of the new minimum fare of 7½ pfennigs (1.79 cents), replacing the previous one of 5 pfennigs (1.19 cents), did not succeed in retarding the decline in receipts that marked the earlier months of the year.

Tax Reductions Asked

Massachusetts Street Railways Present Their Case Before the Joint Legislative Committee on Taxation

Reductions in taxation were advocated by representatives of Massachusetts street railways at Boston, on March 8, before the joint legislative committee on taxation. Five bills were under consideration relative to the abolition of the commutation tax, under which operating companies pay certain highway maintenance costs in proportion to their mileage and gross earnings in municipalities, and to the relinquishment of payments for construction, alteration and maintenance of highways occupied in part by street railway tracks.

James F. Jackson, for the Bay State Street Railway, said that the relief desired was essential to practically all the street railways of the State, but that in the Bay State case the failure of the 6-cent-fare unit, authorized on the suburban and rural lines, to meet expectations made the repeal of this class of taxation laws particularly important. Since 1914 wages had been increased twice on the Bay State system. The arbitration award of 1915 increased the cost of labor $428,000 in two years, compared with 1914. The recent wage agreement meant a further increase of $205,000 for 1917, $379,000 for 1918, $441,000 for 1919, and $492,000 for 1920. Taking as a basis the $39,104,340 Bay State Company investment established by the Public Service Commission in the rate case, the receipts and expenses for 1915 showed that the company needed $836,695, and in 1916 $965,937 to pay a 6 per cent dividend. Had traffic grown as expected in the earlier years, the Bay State revenue would have increased 5 per cent annually, and the company would have earned $3,000,000 more in 1915 than was the case. Last year more than 100,000 private automobiles were registered in Massachusetts. The annual loss to the company on this account approached $1,000,000. It was estimated that jitneys were causing the company a loss of $200,000 in annual revenue. Mr. Jackson contended that the existing laws amounted to double taxation.

Bentley W. Warren, for the Massachusetts Street Railway Association, said that the operating expenses of the Massachusetts companies, exclusive of the Boston Elevated Railway, increased by $4,242,000 from 1911 to 1916. The operating ratio increased from 65.86 per cent to 75.77 per cent, the net increased cost being $1,100,982. In 1916 the dividends paid were 2.4 per cent, compared with 4.3 per cent in 1911, and the surplus was $160,000, compared with $600,000 six years before. Maintenance of way and structures increased $768,000; depreciation in equipment (I. C. C. requirement, 1913) was $312,000 more; wages of conductors and motormen increased $719,000, on the basis of the 1911 wages, and other transportation expenses increased $316,000. The car mileage increased from 69.000,000 to 76,316,000. Platform labor per car-mile increased from 5.47 to 6.75 cents, or 23.4 per cent.

According to Mr. Jackson, the commutation tax was levied in 1898, and it was intended to take the place as a payment for the work which under previous acts the companies were required to perform in the street. The tax had not resulted in relieving the companies from the burdens of inter-track paving, and many companies were performing maintenance work in the original locations besides paying the tax for the municipalities to do the work also. The commutation tax was $478,708 in 1916, the other taxes paid by the companies amounting to $865,368.

Mr. Warren urged that the commutation tax should be removed. It was claimed by some street superintendents that the laying of a rail broke the crown of a street and hence increased the wear and tear somewhat. A reasonable allowance might be made for this, but in general the taxation complained against should be eliminated. Since 1899 the commutation tax had increased from $100.84 to $198 per mile of track, or from 0.37 cents to 0.63 cents per car-mile. General taxes increased from $1,219,853 in 1911 to $1,344,076 in 1916, an addition of $124,233, while dividends decreased from $2,253,667 to $1,424,262, or a drop of $819,000, taking all companies in the State except the Boston Elevated Railway. Even if the Public Service Commission relieved the companies to such an amount as the board found represented the cost of taking care of that part of the street occupied by the tracks, the burden would be excessive, in the companies' opinion. The hearing was continued.

City-Long Island Operating Contract

The Public Service Commission for the First District of New York has received and filed a report from its committee delegated to conduct negotiations with the Long Island Railroad relative to the proposal to lease the tracks of the Whitestone and Little Neck branches of the railroad as extensions of the Corona Rapid Transit line. It is stated that the railroad and the committee have reached a tentative understanding covering several points at issue. This understanding includes a proposed lease with a fixed term of ten years, to continue until terminated by either party upon notice. The city will, under the plan proposed, pay a basic rental of $125,000 the first year, the rental in subsequent years to be increased 6 per cent a year over preceding years, to and including the tenth year, which shall be the maximum amount. Only such proportion of the basic rental as may be earned by the city rapid transit activities shall be paid each year, but such amounts as may not be earned shall subsequently be paid, accumulation of any deficit, however, to be limited to the first five years.

The committee also states that if it is successful in coming to terms with the Long Island Railroad and the Interborough Rapid Transit Company and the New York Municipal Railway Corporation, which will operate the line, there must be a definite provision for charging an additional fare sufficient not only to make the line self-sustaining with a 10-cent fare, but also with a reduced fare. The committee will continue negotiations which will involve the preparation of a form of agreement with the railroad and with the Interborough and with the New York Municipal Corporation.

$16,000,000 Additional Needed

For Completion of New York Elevated Work Estimated in 1913 to Cost $26,000,000

Reasons were presented to the Public Service Commission for the First District of New York on March 9 showing why the Interborough Rapid Transit Company needed an additional $16,436,090 to complete the third-tracking of the elevated lines, for extending the elevated lines, for equipment, and for bettering and enlarging the power plants in Manhattan and the Bronx. Original estimates for this work, prepared in January, 1913, fixed the cost at $26,953,702. That this estimate was inadequate was proved on Oct. 31, 1916, when a total of $24,298,832 had been spent.

Estimates prepared then showed that an additional $18,022,703 would be required to finish the work. According to statements made to the commission by E. F. J. Gaynor, auditor of the Interborough Company, and other officials of the company, the total cost, as indicated on Jan. 1, 1917, would amount to $42,321,535, which meant that the total cost of the dual system of rapid transit would be about $377,000,000. Mr. Gaynor pointed out that the increased cost of the improvements to the elevated lines would not fall on the city, because the company owned the lines. The additional millions needed will have to be raised by the company by an additional issue of the 5 per cent bonds under its first and refunding mortgage of $300,000,000, and before this can be done the consent of the commission will have to be obtained.

Mr. Gaynor said power plant improvements, which it was estimated in 1913 would cost $3,000,000, were now estimated at $5,390,927. He said the increase in plant was necessary in order to provide a reserve supply of power sufficient for any contingency. Mr. Gaynor said:

"The estimates of 1913 set the probable cost of the elevated railroad extensions with the stations at $2,455.441 while the revised estimates indicate that the cost will be $3,666,292. Additional rolling stock represents an increase over the 1913 estimates of $530,884, while the sectionalizing of the third rail represents an expenditure of $486,000. More than $440,000 is represented by interest and tax payments and estimates payments not originally contemplated."

Arkansas Valley Railway, Light & Power Company, Pueblo, Col.—The Arkansas Valley Railway, Light & Power Company has purchased the electric light plants at Ordway and Sugar City, which plants have for the last three years been supplied electric current at wholesale by the Arkansas Valley Company. A new district of the company will be formed, to include Olney Springs, Crowley, Ordway and Sugar City, with headquarters at Ordway.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—It is reported that the Buffalo & Lake Erie Traction Company proposes to apply to the court for permission to issue $400,000 of receivers certificates to meet the cost of expenditures which the company proposes to make for improvements in Erie and vicinity.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—The Chicago, North Shore & Milwaukee Railroad has obtained permission from the Illinois Public Utilities Commission to issue $400,000 of promissory notes.

Duluth-Superior Traction Company, Duluth, Minn.—The Bankers' Trust & Savings Bank, Minneapolis, Minn., is offering at 95¼ and interest to net 5½ per cent a block of the general mortgage 5 per cent sinking fund gold bonds of 1910 of the Duluth Street Railway guaranteed principal and interest by the Duluth-Superior Traction Company, which owns the entire capital stock of the Duluth Street Railway. The bonds are issued to reimburse the treasury for expenditures made in extending the street railway to the new plant of the United States Steel Corporation. The Duluth Street Railway has authorized and outstanding $2,500,000 of first mortgage 5 per cent bonds and $910,000 of general mortgage 5 per cent bonds out of a total of $2,500,000 authorized.

Empire United Railways, Inc., Syracuse, N. Y.—Through the Bankers' Trust Company, the one-year notes of Empire United Railways, Inc., of Feb. 16, 1915, have been called for payment thereon of the pro-rata amount of the net proceeds of funds remitted to the trustee by the guarantors since Dec. 12, 1916, amounting to $60.30 per $1,000 note.

Georgia Railway & Electric Company, Atlanta, Ga.—The Georgia Railway & Electric Company has applied to the Georgia Railroad Commission for approval of an issue of $54,000 of refunding and improvement, forty-year 5 per cent sinking-fund bonds to reimburse the treasury of the company for expenditures made by the company for additions and improvements to its properties during 1916. The commission will hear the application on April 10.

Long Island Railroad, New York, N. Y.—Justice Lehman, of the Supreme Court, decided on March 20 against a receivership for the Long Island Railroad in a suit of Evans R. Dick, of Dick Bros. Company, and other minority stockholders. Dick and the others entered suit against the Pennsylvania Railroad as majority stockholders, and the Long Island Railroad, and asked that a receiver be appointed for the latter company.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—R. P. Stevens, president of the Mahoning & Shenango Railway & Light Company, is quoted as follows in regard to the reported purchase of the Youngstown & Suburban Railway: "The report is without the slightest foundation. There are no negotiations on and none are contemplated for a purchase of the Youngstown & Suburban Railway or for a merger."

Richmond Light & Railroad Company, Richmond, S. I., N. Y.—The Public Service Commission for the First District of New York concluded on March 12 the hearings on the application of the Richmond Light & Railroad Company and the Staten Island Midland Railway for permission to consolidate as the Staten Island Light & Traction Company under the terms reviewed in the ELECTRIC RAILWAY JOURNAL for March 3, page 407. The commission has reserved decision.

Southern Public Utilities Company, Charlotte, N. C.—E. H. Rollins & Sons, Boston, Mass., are offering at 96 and interest an additional block of first and refunding mortgage 5 per cent bonds of the Southern Public Utilities Company of 1913, due July 1, 1943, making $3,953,000 of bonds outstanding.

United Light & Railways Company, Grand Rapids, Mich.—At the annual meeting of United Light & Railways Company, L. P. Hammond, formerly operating manager of Colorado Power Company, and now with William P. Bonbright & Company, New York, N. Y., and Charles H. McNider, a banker of Mason City, Iowa, were elected to the board to fill vacancies.

Dividends Declared

Asheville Power & Light Company, Asheville, N. C., quarterly, 1¾ per cent, preferred.

Carolina Power & Light Company, Raleigh, N. C., quarterly, 1¾ per cent, preferred.

Columbus Railway, Power & Light Company, Columbus, Ohio, quarterly. 1½ per cent, preferred A.

Illinois Traction Company, Champaign, Ill., quarterly, 1½ per cent, preferred.

International Traction Company, Buffalo, N. Y., quarterly, 1¾ per cent, 7 per cent first preferred; quarterly, 1 per cent, 4 per cent preferred; quarterly, 1 per cent, common.

Ottawa (Ont.) Traction Company, Ltd., quarterly, 1 per cent.

Ridge Avenue Passenger Railway, Philadelphia, Pa., quarterly, $3.

United Gas & Electric Corporation, New York, N. Y., quarterly, 1¾ per cent, first preferred.

Utah Power & Light Company, Salt Lake City, Utah, quarterly, 1¾ per cent, preferred.

Washington, Baltimore & Annapolis Electric Railroad, Washington, D. C., quarterly, 75 cents, preferred.

West India Electric Company, Ltd., Kingston, Jamaica, quarterly, 1¼ per cent.

Electric Railway Monthly Earnings

Period		Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
BATON ROUGE (LA.) ELECTRIC COMPANY						
1m., Jan.,	'17	$20,445	*$9,977	$10,468	$3,565	$6,903
1 " "	'16	17,827	*9,202	8,625	3,497	5,128
12 " "	'17	214,312	*101,634	112,678	42,070	70,608
12 " "	'16	193,045	*107,209	85,836	28,263	57,573
BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.						
1m., Jan.,	'17	$9,015	*$10,246	†$1,231	$1,134	†$2,365
1 " "	'16	8,076	*7,546	530	1,104	†574
12 " "	'17	123,554	*111,816	11,738	13,313	†1,575
12 " "	'16	115,821	*96,500	19,321	13,452	5,869
CAPE BRETON ELECTRIC COMPANY, SYDNEY, N. S., CANADA						
1m., Jan.,	'17	$38,581	*$23,209	$15,372	$6,552	$8,820
1 " "	'16	34,120	*19,190	14,930	6,556	8,374
12 " "	'17	398,127	*235,285	162,843	78,324	84,519
12 " "	'16	362,280	*207,835	154,445	79,007	75,438
COLUMBUS (GA.) ELECTRIC COMPANY						
1m., Jan.,	'17	$89,607	*$33,181	$56,426	$28,520	$27,906
1 " "	'16	71,947	*30,745	41,202	28,688	12,514
12 " "	'17	899,013	*353,668	545,345	343,407	201,938
12 " "	'16	732,396	*325,913	406,483	344,440	62,043
DALLAS (TEX.) ELECTRIC COMPANY						
1m., Jan.,	'17	$200,256	*$115,783	$84,473	$40,908	$43,565
1 " "	'16	173,132	*101,619	71,513	36,813	‡36,700
12 " "	'17	2,017,545	*1,221,777	795,768	455,982	‡355,929
12 " "	'16	1,822,267	*1,116,775	705,492	407,957	‡300,735
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.						
1m., Jan.,	'17	$79,352	*$40,178	$39,174	$9,627	$29,547
1 " "	'16	66,094	*35,138	30,956	8,712	22,244
12 " "	'17	839,571	*449,462	390,109	108,613	281,496
12 " "	'16	735,658	*391,299	344,359	105,504	238,855
EL PASO (TEX.) ELECTRIC COMPANY						
1m., Jan.,	'17	$116,343	*$65,144	$51,199	$5,245	$45,954
1 " "	'16	105,282	*48,568	56,714	4,672	52,042
12 " "	'17	1,121,778	*675,140	446,638	59,700	386,938
12 " "	'16	994,769	*525,632	469,137	50,855	418,282
GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.						
1m., Jan.,	'17	$163,075	*$113,216	$49,859	$36,910	$12,949
1 " "	'16	156,438	*106,102	50,336	36,590	13,746
12 " "	'17	1,951,476	*1,243,222	708,254	439,312	268,942
12 " "	'16	1,930,668	*1,210,549	720,119	433,690	286,429
HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.						
1m., Jan.,	'17	$28,753	*$18,683	$10,070	$5,225	$4,845
1 " "	'16	24,835	*17,041	7,794	5,522	2,272
12 " "	'17	330,315	*188,101	142,214	63,618	78,596
12 " "	'16	281,480	*158,552	122,928	66,434	56,494
JACKSONVILLE (FLA.) TRACTION COMPANY.						
1m., Jan.,	'17	$59,161	*$38,325	$20,836	$15,547	$5,289
1 " "	'16	53,047	*36,356	16,691	14,735	1,956
12 " "	'17	633,307	*425,675	207,632	184,720	22,912
12 " "	'16	609,855	*427,693	182,162	179,184	2,978
LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO						
1m., Jan.,	'17	$131,588	*$95,926	$35,662	$36,457	†$795
1 " "	'16	113,369	*76,820	36,549	36,109	440
LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.						
1m., Jan.,	'17	$198,165	*$143,158	$55,007	$50,885	‡$15,638
1 " "	'16	177,727	*118,064	59,663	51,895	‡18,160
12 " "	'17	2,558,565	*1,627,376	931,189	626,881	‡452,434
12 " "	'16	2,165,345	*1,275,693	889,652	654,495	‡373,286
NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO						
1m., Jan.,	'17	$490,380	$282,843	$207,537	$84,008	$123,529
1 " "	'16	367,141	176,752	190,389	88,433	101,956
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.						
1m., Jan.,	'17	$171,099	*$105,215	$65,884	$29,232	$36,652
1 " "	'16	150,628	*94,614	56,014	29,086	26,928
12 " "	'17	1,950,792	*1,167,680	783,112	347,075	436,037
12 " "	'16	1,719,169	*1,057,053	662,116	332,638	329,478
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.						
1m., Jan.,	'17	$28,787	*$21,394	$7,393	$7,309	$84
1 " "	'16	27,453	*16,615	10,838	7,473	3,365
12 " "	'17	312,297	*218,381	93,916	86,510	7,406
12 " "	'16	290,535	*178,916	111,619	90,946	20,673
SAVANNAH (GA.) ELECTRIC COMPANY						
1m., Jan.,	'17	*75,053	*$50,908	$24,145	$24,078	$67
1 " "	'16	66,135	*43,927	22,208	23,316	†1,108
12 " "	'17	835,011	*560,676	274,335	283,517	†9,182
12 " "	'16	789,758	*515,671	274,087	278,399	†4,312
TAMPA (FLA.) ELECTRIC COMPANY						
1m., Jan.,	'17	$92,314	*$47,579	$44,735	$4,255	$40,480
1 " "	'16	86,705	*43,840	42,865	4,298	38,567
12 " "	'17	972,695	*531,457	441,238	52,372	388,866
12 " "	'16	982,394	*505,770	476,624	52,216	424,408

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*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

Prepayment Areas Recommended

Public Service Commissioner Eastman Favors Right of Boston Elevated to Establish Means to Prevent Transfer Abuses

At a hearing March 9 in Boston by the legislative committee on metropolitan affairs relative to the finances of the Boston (Mass.) Elevated Railway, Joseph B. Eastman of the Massachusetts Public Service Commission discussed the benefits of prepayment areas in relation to transfer abuses and advocated granting the company the right of eminent domain to establish additional areas of this character under the supervision of the commission. Mr. Eastman called attention to the fact that over 200,000 paper transfers are at present issued daily by the Boston company. He pointed out that in crowded conditions of traffic it is practically impossible for the conductor to issue transfers properly or to make any adequate inspection of those which he takes in. The company cannot audit these transfers without prohibitive expense. The opportunities for abuse, Mr. Eastman said, are apparent.

FARE BOXES SAVE 5 PER CENT ON FARES

The speaker stated that it is estimated that the use of prepayment fare boxes saves the company probably 5 per cent on its fares. If only 5 per cent of the transfers is lost to the company, the loss is nevertheless over $200,000 annually. In addition to the reduction of losses due to the use of prepayment areas, the convenience of being able to transfer under shelter and free from the dangers of street traffic was emphasized by the commissioner. The special commission reporting upon the Boston Elevated situation strongly recommends that the company establish a prepayment station at the Maverick Square entrance of the East Boston tunnel, not because there is any particular abuse of paper transfers at that point or for convenience, but because of converging surface lines whose cars enter the tunnel at this place. Mr. Eastman pointed out that if the company can bring into the transfer or prepayment area two or three cars, open all doors and unload and load rapidly without obliging the conductors to collect fares from all entering passengers, the traffic can be handled much more expeditiously than is possible at present. This in turn would increase the traffic capacity of the tunnel proper. The right of eminent domain, however, should only be accorded under commission supervision. That the 6-cent fare must come as the ultimate remedy for increasing cost of service in all its aspects, Mr. Eastman was not ready to admit, but he emphatically set forth the fact that the public must meet the cost of whatever service it requires, whether under private or public ownership. Later he underwent an unusually searching cross-examination at the hands of the committee, during which he urged on behalf of the public welfare that the state ought to do its part in reducing the burdens under which the Boston Elevated is struggling.

Harrisburg Jitney Case Continued

By agreement of counsel for both sides, the Public Service Commission of Pennsylvania on March 14 continued the hearing of the Harrisburg jitney case for three weeks. The case was opened at 9.30 a. m., but was adjourned at 10 o'clock for a special conference between the attorneys representing the jitney men and the Harrisburg Railways. The attorneys after one hour's deliberation announced that an agreement had been reached, on the ground that all jitney men make application for a certificate of public convenience, without admitting that they are common carriers, or come under the jurisdiction of the Public Service Commission. At the next hearing testimony will be heard on complaint made by the Harrisburg Railways as to whether or not the jitney is a common carrier.

Getting Publicity Through Complaints

"Getting Publicity" is the title of an article by Edward R. Kelsey, advertising manager of the Toledo Railways & Light Company, Toledo, Ohio, which has appeared in the March issue of *Doherty News*. The message of the article is to show that common sense, coupled with ordinary consideration, will place any corporation in friendly touch with the public.

Speaking of complaints as a fruitful source of securing much good publicity, Mr. Kelsey says:

"The moment you commence to advertise for complaints, just that minute will your complaints commence to diminish greatly.

"Answer all complaints that show by their form they were made in good faith. People believe what they see printed over and over again, and public utility companies which continually refuse to answer such complaints and leave the field of publicity to agitators and chronic faultfinders are but sowing the wind from which later they will surely reap the whirlwind.

"Some corporation lawyers may tell you that it isn't dignified for the company to take notice of such complaints. Probably more constructive things have been left undone by public utility companies on the plea that it isn't dignified than from any other cause."

"Owl" Fare Case Decided

Superior Court of Pennsylvania Decides Pittsburgh "Owl" Fare Case in Favor of the Public Service Commission—Company Will Appeal

The Superior Court of Pennsylvania, in a recent decision, upheld the Public Service Commission in its decision that the Pittsburgh (Pa.) Railways could not increase its fares at night on the ground that it had not given the public proper notice of the proposed change. No opinion was expressed either by the commission or the court in regard to the authorization of an increase in rates.

On the night of June 22, 1916, the Pittsburgh Railways doubled its "owl" or night fares. Complaints against the proposed increase were filed immediately with the Public Service Commission by William Jacoby and the city of Pittsburgh on the ground that the increase was unjustifiable and that the public had not been duly notified. The commission made an order requiring the company to issue certificates of rebate redeemable if the commission decided against the company's action. On Sept. 28 the commission decided that the company had not complied with the Public Service Company Law, which states that no change in rates of fares shall become effective except after the commission and the public have been given thirty days' notice. The case was argued before the Superior Court in November, and in the decision just handed down the ruling of the commission is upheld. An appeal from this decision will be made by the railway to the Supreme Court.

Boston Wants One-Man Cars

Public Service Commission of Massachusetts to Consider Use of One-Man Cars on Two Roads

The Boston Elevated Railway and the Brockton & Plymouth Street Railway have petitioned the Public Service Commission of Massachusetts for authority to institute one-man car service. In the case of the Boston Elevated Railway, M. C. Brush, president of the company, asks the board to permit the use of a Brill one-man car in East Boston, between the Maverick Square entrance of the East Boston tunnel and North Ferry. The car is of the double-end, single truck type, 27 ft. 9¼ in. long over all, and 17 ft. 9½ in. over corner posts; it has fourteen cross seats and a total seating capacity of thirty. The car body weight is 6000 lb., and the weight of the truck, exclusive of wheels and axles, is 1630 lb. The Brockton & Plymouth Street Railway desires to operate a car of the so-called Birney type, in general similar to the type selected for service on various other Stone & Webster properties, and described previously in the ELECTRIC RAILWAY JOURNAL. The commission will hold a hearing of the two petitions March 23 at Boston.

Traffic Problems Discussed

At a meeting of the Worcester Polytechnic Branch of the A. I. E. E. held on March 16 in Worcester, Edward Dana, manager of surface transportation of the Boston Elevated Railway, delivered an illustrated lecture on the "traffic Problems of a Large Urban System."

Mr. Dana first called attention to the early, crude means of obtaining data upon which service was based. These means based on the number of passengers per half trip or trip, and not upon the largest number of passengers upon the car at any one time, resulted, of course, in an uneconomical operation of service. The speaker then reviewed the development of the very complete and efficient set of forms calculated to give traffic statistics from all possible angles. These forms, which included all types of regular traffic forms, from the original counts to simple graphic representations, were shown on the screen during the talk.

Attention was called to supplementing counts taken at traffic points by characteristic counts taken by riding the heavy routes passing those points to determine whether or not the riding was heavy at other points on those routes.

A re-routing problem was then taken up and special emphasis was placed upon proper publicity along definite lines to acquaint the public, improvement associations and governing bodies with the attitude taken by the company, and the reasons for that attitude. It was pointed out that this publicity usually resulted in the undivided co-operation of the community served.

The talk was concluded by the presentation of a series of slides, showing the types of cars from the very earliest horse car to the latest trailer train. As the pictures were thrown on the screen Mr. Dana related interesting anecdotes of each type as it was shown.

Hearing on "Squealing" Brakeshoes.—The hearing on March 19 by the Public Service Commission of New York, First District, on the subject of "squealing" brakeshoes on cars of the elevated lines, was adjourned for further testimony on June 4 pending results of experiments which are now being carried out.

Boston Elevated Puts Ban on Liquor.—A notice which has just been posted in all the carhouses, shops and other departments of the Boston (Mass.) Elevated Railway, and put in the hands of everyone connected with the service, virtually prohibits the use of liquor among all officials and employees. The order was signed by President M. C. Brush.

Hearing on Inclosed Vestibules.—The hearing by the Public Service Commission of the First District, New York, in regard to the proposed order requiring all electric surface cars operated in Greater New York to be equipped with fully inclosed vestibules, which was adjourned on Jan. 31 for further investigation, as reported in this paper for Feb. 3, page 228, was continued on March 14 and then adjourned for final hearing on March 28.

Two-Car Trains for Montreal.—More than $1,000,000 will be invested in new equipment for the Montreal (Que.) Tramways, the major portion of which is to be expended for fifty two-car trains. Experiments with trailers hauled by motor cars in two-car units had been conducted for some time before the orders were placed, and the results were very satisfactory, especially as the public and the train crews quickly became accustomed to their use.

Salesmanship in Railway Service.—An editorial which appeared in the March 15 issue of the bulletin published by the United Railways, St. Louis, Mo., sets forth principles which, when observed, make the conductor a better company representative. It is entitled "The Conductor as a Salesman," and was written by Richard McCulloch, president of the company. Mr. McCulloch says the conductor is a salesman of rides. He regards courtesy at all times, especially in handling complaints, as very important in forming correct opinions about the service.

Railway Folder Stimulates Interest.—The city guide recently issued by the Kansas City (Mo.) Railways to instruct the citizens and out-of-town visitors on the important points of interest in Kansas City, Mo., and Kansas City, Kan., has been effective in stimulating a project of the Greeters, an organization of hotel clerks, which was under way to inform themselves to answer all questions from guests regarding the city. At the monthly meeting of the Greeters a definite program was adopted and the railway folder will be supplied to the members as a basis of their new service.

Skip-Stop Education in Baltimore.—Following the request made by the United Railways & Electric Company, Baltimore, Md., through newspaper advertisements for expressions of opinion concerning the proposed skip-stop plan, hundreds of replies were received, 89 per cent of which expressed a desire for the change, and polls taken at the various city clubs resulted 312 to 19 in its favor. In order to inform the public about skip-stop operation, the company has described the plan in detail in a small folder using the question-and-answer method. More than 200,000 of these folders were distributed during the week commencing March 19. They were sent to civic bodies and distributed on the cars from the racks used for *Trolley News*, the company publication.

Automobile Accidents on the Increase.—Careless and indifferent driving, manifesting the lack of safety-first operation on the part of automobile drivers, is evidenced in the accident report of the Detroit (Mich.) United Railway for the year 1916, which shows a total of 8710 collisions between motor vehicles and street cars, or an increase of more than 65 per cent over the number for 1915. In each of these cases the motor vehicle was on the track or attempted to cross a track at the time when a street car reached the spot. This shows a condition over which the street railway has no control and, with the general increase in traffic, since the number of accidents of all kinds involving all other vehicles and pedestrians had increased less than 24 per cent during the same period, the major portion of the responsibility is placed upon the drivers of motor cars.

Grade Crossings Opposed in Louisville.—Agitation in Louisville, Ky., for the elimination of grade crossings, following the disastrous collision in February of which mention was made in this paper for Feb. 24, page 367, has resulted in the organization of the joint city survey and city plan committee, made up of representatives of about twelve commercial, professional and civic organizations of Louisville. It was formed under the auspices of the Louisville Engineers & Architects Club, with J. C. Murphy, chairman of the state and municipal committee of that organization, as chairman of the joint committee. There have heretofore been several organized attempts to obtain reforms in Louisville in the manner now contemplated, and it is believed that now the movement has been started on a permanent basis. Elimination of grade crossings is only one of the projects to which the joint committee will give its attention.

Jitney License Fees Advanced in Los Angeles.—The City Council of Los Angeles, Cal., has adopted an ordinance increasing license fees for jitney buses about 30 per cent. According to the new ordinance, which goes into effect on April 1, five-passenger vehicles must pay $11.25 per quarter; seven-passenger, $16.75; eight to ten-passenger, $18; eleven to fifteen-passenger, $23; sixteen to twenty-passenger, $27; twenty-one to twenty-five-passenger, $30; twenty-six to thirty-passenger, $34. Interurban buses must pay approximately half as much as city buses. The Board of Public Utilities has recommended to the Council that brokers of interurban bus tickets be licensed. Many persons have been defrauded by purchasing tickets, which were later rendered valueless by retirement from business of bus companies which sold the tickets. A license fee of $60 a year was recommended for such ticket brokers. The City Council has the matter under consideration.

Quick Transportation for Carnival Crowds.—It is estimated that during the recent Mardi-Gras festival in New Orleans, La., more than 600,000 passengers were carried daily by the New Orleans Railway & Light Company. This is 100 per cent more than the average maximum haulage and required extra precautions to prevent undue delays. A wagon with linemen and equipment preceded each parade in order to meet any emergencies, pitmen were stationed at strategic points to repair possible damages to cars and men in the power station gave special attention to the apparatus during the hours of heaviest traffic. Traffic men were stationed along the lines, and a wrecker and motor trucks were in readiness to respond to any calls. The claim department was prepared to rush investigators in automobiles to the scene of any accident, and special facilities were provided to give immediate medical aid. Special supervisors directed the starting of cars and prevented passengers from riding where they would be in danger.

Fare Reduction by Connecticut Company Improbable.—After a conference with members of the Public Utilities Commission and officials of the Connecticut Company relative to the establishment of a 5-cent fare within the Shelton city limits and a total 15-cent fare to Bridgeport, Representative John B. Dillon reports that, in his opinion, such a reduction is not likely to be granted at the present time. He says he believes the company will do its utmost to remedy conditions considered to be unsatisfactory, but will oppose any move to secure a fare reduction between the two cities. The railway has urged the people to purchase books of tickets to secure a reduced rate, and its officials have cited instances where the conditions are similar and in which the railway was upheld in maintaining the prevailing rate of fare. J. K. Punderford, vice-president and general manager of the Connecticut Company, attributes the prevailing unsatisfactory condition on a number of lines to the scarcity of labor and cars, stating that the company is unable to get the right kind of men to operate the cars and that the difficulty in securing new cars is also great.

Hitch Over Municipal Railway Extension.—The negotiations between the city of Tacoma and the Tacoma Railway & Power Company, Tacoma, Wash., for the extension of the municipal railway on the tideflats from its present terminus, 1¼ miles outside the corporate limits, to the Todd shipyards, were complicated recently when Louis H. Bean, general manager of the Tacoma Railway & Power Company, told the Council his company would enter into an agreement for the operation of the line on condition that it be allowed to charge an additional 2-cent fare for carrying tideflats patrons on transfers. Mayor Fawcett voiced his disapproval of the proposal. Mr. Bean said that the extension was going outside the city limits, and that he believed it not unfair to charge an extra sum for patrons who board the line on transfers. Mayor Fawcett recently secured the passage of a resolution through the City Council by which the city agreed to build the extension to the Todd Shipyards under the terms of the existing contract, providing the funds could be secured that are necessary to finance the work. Comptroller Shoemaker estimates that the total cost of building the line will be about $75,000, instead of the $50,000 as estimated by the Council. The present municipal line across the tideflats cost $35,000.

Skip-Stop Urged in Chicago.—Alderman H. D. Capitain, chairman of the local transportation committee, and R. F. Kelker, Jr., transportation supervisor, were authorized at a recent meeting of the City Council to prepare a form of ballot for submitting to patrons of two or three lines in order that they might signify their desire for a trial installation of the skip-stop system. If the riders on these lines vote to have the skip-stop plan tried out, it will be installed for a period of two or three months and they will then be given an opportunity to express again their approval or disapproval of the system. Cross-town lines which have a number of short stops, or lines on which all cars could be put in operation under the skip-stop plan, will be used for the trial. It is intended, if the riders approve the plan, to arrange about seven stops to the mile, whereas the number now is about fourteen. The skip-stop as a form of express service was suggested by city officials, as the transportation companies have felt that it is a matter in which the city should take the initiative. An approval of the skip-stop plan on certain lines was granted in the fall of 1915, and was to be put in operation on the day of the Eastland disaster which closed the Clark Street bridge. This caused a delay, and as cold weather soon followed the plan was abandoned. If the present trial is effected, no cars will be removed from service, but rather, if the schedule is materially speeded up, the extra cars will be employed for the purpose of giving additional service.

Legal Notes

MICHIGAN.—*Conductor Must Be on Rear Platform When Car Backs.*

Plaintiff, though knowing that a standing street car would have to be backed further before it could be turned, had a right to assume that it would not be backed till the conductor was on the rear platform to give notice and warning, as required by ordinance, and so was not guilty of contributory negligence, as matter of law, in not looking towards it after leaving the curb, five or six steps from the first rail, walking rapidly to pass in the rear of it to catch another car about to start. (McManigle v. Detroit United Ry., 160 Northwestern Rep., 423.)

NEW YORK.—*Rule Limiting Transfers to Shortest Route Reasonable but Publication Necessary.*

Under the transfer law, a rule of a company not to issue transfers between line A and B on the ground that otherwise a passenger could make a continuous trip from the point where he boarded the car, and that there was a shorter and more direct route to his destination, was a reasonable rule and within rights of the company. However, where such rule was known only by the company's conductors, and had not in any way been brought to the attention of the traveling public, it could not be enforced. (Hickman v. International Railway, 160 New York Supplement, 994.)

NORTH CAROLINA.—*Trespasser on Steam Railroad Freight Car Struck by Low Trolley Wire.*

Deceased, while riding on the top of a freight car at the invitation of a brakeman, in consideration of his assisting in the movement of freight and with permission by the conductor to ride, was struck by a power wire of the defendant traction company stretched across the right of way and negligently allowed to sag so low as to threaten the safety of all persons on cars or trains of that character. As a result deceased was thrown from the train and killed. Held that, though as to the railroad company deceased was a trespasser, nevertheless recovery against the traction company could not be denied as a matter of law on that ground, for the wrong was not to the traction company but to the railroad company, and the traction company was guilty of negligence in allowing its wire to sag so as to endanger those on trains. (Ferrell v. Durham Traction Co., 90 Southeastern Rep., 893.)

PENNSYLVANIA.—*Right of Entry over Private Property Appraised.*

Where a street railway and the owner of land over which the railway constructed poles and lines entered into a written agreement, submitting to arbitrators the amount of compensation due the owner and making their decision conclusive, the arbitrators did not exceed their authority in considering the item of future damages to the land from the maintenance and operation of the line, nor in taking into consideration that the defendant was to have the right to enter and cross the land of plaintiff at any point they might desire, to maintain and operate the line of railway. (Thornburgh v. West Penn Railways, 98 Atlantic Rep., 894.)

VERMONT.—*Regulation by Public Service Corporation—Removal of Wires.*

An order of the Public Service Commission, made on petition of a telegraph company, requiring a traction company, owning its right-of-way, to remove its high-tension power wires from dangerous proximity to telegraph wires, did not exceed the constitutional powers of the commission as being confiscatory of the traction company's property and a taking without "due process of law," in violation of federal Const. Amends. 5 and 14; private ownership of its right-of-way not giving the traction company the right to erect its high-tension line thereon without regard to the rule restricting every man against using his property to the prejudice of others. (Western Union Telegraph Co. v. Burlington Traction Co., 99 Atlantic Rep., 4.)

Personal Mention

Harrison Williams has been elected president of the Republic Railway & Light Company, New York, N. Y., to succeed Oren Root, resigned.

Joseph Johnson has resigned as chief of the transit bureau of the Public Service Commission for the First District of New York, effective on March 31. He will re-enter newspaper work.

Francis T. Homer, vice-president of The United Gas & Electric Corporation, New York, N. Y., has been elected president of the American Cities Company, New York, to succeed Hugh McCloskey.

W. P. Allen has resigned as assistant district attorney of New York to become a member of the legal staff of the Third Avenue Railway, that city. Mr. Allen was formerly Assistant United States District Attorney.

Frank K. Bowers has been appointed general inspector of the Public Service Commission of the First District, New York, to succeed James A. McQuade, who resigned to join his brother in the stock brokerage business.

Frank Hedley, vice-president and general manager of the New York Railways and the Interborough Rapid Transit Company, New York, N. Y., who on March 12 underwent an operation for mastoid trouble, is steadily convalescing.

E. C. Foster, president of the Manchester Traction, Light & Power Company, Manchester, N. H., was presented with a handsome gold-headed cane by the employees at a complimentary smoker and entertainment given recently in his honor.

Harry H. Lyons, who has been connected for the past five years with the Arkansas Valley Railway, Light & Power Company, Pueblo, Col., has been appointed district superintendent of the new division of that company, which includes Ordway, Sugar City, Crowley and Olney Springs.

B. J. Arnold, Chicago, Ill., has been engaged by the Harrisburg (Pa.) Railways to investigate street railway conditions in Harrisburg. Mr. Arnold was engaged a few years ago by the Municipal League of Harrisburg to report on street conditions in the heart of the city, and is, therefore, familiar with local traffic problems.

G. A. Green, superintendent of the Fifth Avenue Bus Company, New York, N. Y., and a director of the Motor Truck Club of America, has received an appointment as captain in the British Army and will leave on March 31 for the Somme front to take command of a gun company operating "tanks." Mr. Green is a British subject. He has been in this country six years.

Sydney O. Swenson has resigned as a member of the engineering force of Putnam A. Bates, consulting engineer, of New York. Mr. Swenson was assistant electrical engineer of the Detroit Tunnel electrification from 1907 to 1911 and from 1911 to 1916 was electrical engineer of the Kansas City Railway Terminal Company, which installed the union steam railroad terminal in Kansas City.

W. H. Chilton has been promoted to the position of division superintendent of the New York State Railways, Syracuse Lines, Syracuse, N. Y., to fill the vacancy made by the death of George A. Valentine. Mr. Chilton entered the employ of the Syracuse (N. Y.) Rapid Transit Railway in 1905 as a conductor, and has been connected with this company and its successor, the New York State Railways, since that time.

Thomas E. Francis has been appointed general attorney for the United Railways, St. Louis, Mo. Mr. Francis was born in Bevier, Mo., in 1878. At the age of fourteen he was employed as office boy by the Loomis Coal Company, and held different positions with that company for five years. He then began the study of law and was admitted to the Macon County, Mo., bar in 1899. After practising law in Bevier until 1906 he became a member of the legal staff of the United Railways and for the past eleven years has devoted his attention to the affairs of that company.

B. F. Lyons, vice-president and general manager of the Beloit Water, Gas & Electric Company, Beloit, Wis., and president of the Wisconsin Gas Association, has been elected president of the Wisconsin Electrical Association. Mr. Lyons was graduated from the University of Wisconsin in 1903, and upon leaving college became assistant engineer for the Laclede Gas Light Company, St. Louis, Mo. He remained in the employ of the Laclede Gas Light Company for three years, after which he served the Merchants Power Company, Memphis, Tenn., until 1907, when he began his present work.

William Clayton, vice-president and managing director of the San Diego (Cal.) Electric Railway and vice-president of the San Diego & South Eastern Railway, San Diego, Cal., was shot and perhaps fatally wounded on March 12 by Lorenzo Bellomo, an Italian bootblack, who, it is believed, sought revenge for an injury sustained six years ago in a street railway accident. After a hasty examination at the hospital, physicians pronounced Mr. Clayton's condition as serious. Bellomo stated at Police Headquarters that, since the loss of his foot in a street car accident, he has had difficulty in making a living, and, after asking Mr. Clayton several times for work, he decided to kill him.

Oren Root has resigned as president and a director of the Republic Railway & Light Company, New York, N. Y., which controls the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. The Republic Railway & Light Company is controlled by the Harrison Williams interests, with which Mr. Root became connected in November, 1912. Soon thereafter he was elected president of the Republic Railway & Light Company with offices in New York. Mr. Root had previously been connected with the Metropolitan Street Railway, now the New York Railways, for many years, and was general manager for the receivers of that property when he resigned to become associated with Mr. Williams.

George W. Knox, vice-president and general manager of the Oklahoma Railway, Oklahoma City, Okla., has contributed an article to the *Employer*, an Oklahoma magazine, entitled "Labor Troubles Unnecessary; All Due Entirely to Man's Inhumanity to Man." Mr. Knox in the article contends from his own successful experience that labor problems are easily adjusted when men get together in the right spirit, and that "if contentious humanity the world over—hardly ever free from strife and warfare—would but stop and consider, analyze and compare conditions and be generous and unselfish enough to be governed by even a small part of the sense of justice which all possess to some degree or other, the 'strike' and 'lockout' contingent along with the ever ready and gifted 'exponent,' writer or talker of how all social and industrial problems should be handled, would be lonesome for something to write, talk and fight about."

Jiro Komiya, electrical engineer to the Imperial Government Railways, Tokio, Japan, who has been in this country since last July, intends to spend one year studying American practices in electrical transmission and railroad electrification. He came by way of Seattle, Wash., and, after visiting several roads in the Pacific States, spent five weeks observing the operation of the electrified portion of the Chicago, Milwaukee & St. Paul Railway. He then visited the principal electric railways in the East and South, and hopes to see the electric division of the Norfolk & Western Railway in Virginia, and other lines in the Central States and Canada. Mr. Komiya will return home in August, going by way of Europe to investigate electric operation there, if possible. He is much impressed with the success of electricity for motive power in this country, and expressed to a representative of the ELECTRIC RAILWAY JOURNAL his appreciation of the courtesy shown to him by the many railway men whom he has met. Mr. Komiya is at present in New York.

M. C. Sauerwein has been appointed general manager of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., to succeed James P. Barnes, who resigned to become general manager of the Schenectady (N. Y.) Railway. Mr. Sauerwein comes to Rochester from the Maryland Electric Railways, Annapolis, Ind., where he was assistant general manager. He began his railroad career in 1906, when he was employed by J. G. White & Company, Inc., New York, in the construction of 25 miles of tidewater road between

Cochran and Tinkling, Va. A year later, when the same company began the electrification of the Maryland Electric Railways, between Baltimore and Annapolis, Mr. Sauerwein was appointed assistant to the superintendent of the line. When the electrified line was placed in operation, in June, 1908, Mr. Sauerwein was continued with the company as secretary to the general manager and purchasing agent. In September, 1914, he was appointed general passenger and freight agent of the company, and about a year ago he was promoted to the position of assistant general manager. In his new capacity as general manager of the Buffalo, Lockport & Rochester Railway, Mr. Sauerwein will have charge of this line between Rochester and Lockport, N. Y., which connects at Lockport with the Buffalo & Lockport division of the International Railway, Buffalo, N. Y.

Hugh McCloskey has been succeeded as president of the American Cities Company, New York, N. Y., by Francis T. Homer, as noted elsewhere in these columns. Mr. McCloskey's active connection with the affairs of the New Orleans Railway & Light Company and the American Cities Company, by which the New Orleans Railway & Light Company is controlled, dates from March, 1908, when he was elected chairman of the board of directors of the latter company. Later he was elected president of the company and the position of chairman of the board was abolished. Following the completion of the construction program which he laid down for the company in New Orleans Mr. McCloskey relinquished the office of president of the company, again became chairman of the board and in addition president of the American Cities Company. Mr. McCloskey has many interests in New Orleans. He is a vice-president of the D. H. Holmes department store, vice-president of the Hibernia National Bank and vice-president of the Hibernia Insurance Company. He was also the founder of McCloskey Brothers, one of the largest wholesale grocery and produce firms in the South. He has been active in nearly all the movements for the civic betterment of New Orleans, and received in 1913 the New Orleans *Picayune's* loving cup for his public-spirited efforts in helping to give the city its wharves and sheds.

A. H. Ford, the new president of the New England Street Railway Club, is a well-known figure in the field of public utility management. He was born in New York in 1859 and his early education was received at Evansville, Ind. At the age of sixteen Mr. Ford left school and entered the steam railroad field, serving as traveling auditor, auditor and treasurer of roads connecting with Evansville and Louisville, Ky. In 1893 he became secretary and treasurer of the New Orleans (La.) Traction Company, Ltd. This road at the time was being changed from mule power to give electric service. In 1900 Mr. Ford became manager of the New Orleans & Carrollton Railroad, under the control of the New Orleans banking house of Isidore Newman & Son, and for fourteen years was identified with interests controlled by this establishment. In 1902 he became a confidential adviser to the Newman interests, and in 1904 he removed to New York to become manager of the operating department of Ford, Bacon & Davis, engineers, and was also president of the American Cities Railway & Light Company at that time. In 1907 he resigned these positions to become president and general manager of the Birmingham Railway, Light & Power Company, Birmingham, Ala., and in June, 1914, was appointed vice-president and general manager of the Cumberland County Power & Light Company, Portland, Me., and of the Lewiston, Augusta & Waterville Street Railway, Lewiston, Me. Under Mr. Ford's management these large traction and central station properties have developed rapidly and now rank with the most important public utilities in New England.

A. H. FORD

J. P. H. De Windt, Jr., has been appointed chief of the transit bureau of the Public Service Commission, First District, New York, to succeed Joseph Johnson, who resigned to resume newspaper work. Mr. De Windt is a native of New York City and has had a wide experience with railway and electric lighting companies. During the eleven years prior to 1913, he was superintendent of the Connecticut Company, New Haven, Conn., general manager of the Shore Line Electric Railway, Norwich, Conn., and was also in charge of engineering and development work in the Canadian Northwest for E. S. Goldthwaite and associates, engineers and contractors of Springfield, Mass. In 1913 he became general manager of the Birmingham Railway, Light & Power Company, Birmingham, Ala., and was vice-president and general manager of that company for two and one-half years before 1916, when he was assigned, in addition to his regular duties, to some engineering work with the American Cities Company. In June, 1916, Mr. De Windt, Jr., resigned from these two companies and returned to New York, where he has since been actively engaged in engineering work.

J. P. H. DE WINDT, JR.

Obituary

H. W. Cunningham, master mechanic of the Laurel Light & Railway Company, Laurel, Miss., died on March 1 at the Laurel General Hospital after a week's illness caused by a mastoid abscess. Mr. Cunningham had been connected with the company since the completion of the construction of the property in 1912.

Joseph L. Willcutt, for many years secretary of the Southern Pacific Company and also secretary of the Market Street Railroad in San Francisco, Cal., died Feb. 27 at his home in Oakland. Mr. Willcutt was born in Boston in 1829 and settled in San Francisco in 1852. Up to within about a month of his death Mr. Willcutt, in spite of his advanced years, had been in the habit of visiting San Francisco frequently. He retired from his association with the street railway interests in San Francisco in 1900, and from the steam railroad interests in 1908, but maintained a minor association with the Southern Pacific Company until the last. He was the father of George B. Willcut, secretary and comptroller of the United Railroads of San Francisco, and of H. D. Willcutt, who is the auditor of the same company.

Ferdinand W. Roebling, Sr., died at his home in Trenton, N. J., on March 16. Mr. Roebling was born in Saxonburgh, Pa., in 1842, and was graduated from the Polytechnic College of Philadelphia, where he had specialized in chemistry. His father, John A. Roebling, was a pioneer in the manufacture of wire rope, and was the founder of the firm of John A. Roebling's Sons Company, bridge builders, of which Mr. Roebling became treasurer and general manager. In 1869 his father died after starting the construction of the Brooklyn Bridge, leaving it to be completed by his four sons, of whom Ferdinand was the second eldest. The firm branched out and specialized in wire rope manufacture, and developed the large plant now at Trenton, N. J. Besides his manufacturing interests, Mr. Roebling was vice-president of the Syracuse & South Bay Electric Railroad, Syracuse, N. Y., a director of the Trenton & Mercer County Traction Corporation, Trenton, N. J., and the Interstate Railways, Camden, N. J., and was also a director of a number of banks and electric lighting, insurance and water companies. His death means the loss to his community of one of its most active and public-spirited members, and he is given the credit of having done more than any other individual to increase its opportunities.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***South Georgia Power Company, Valdosta, Ga.**—Application for a charter has been made by the South Georgia Power Company to supply electrical power and to operate electric railways in Georgia. Capital stock, $25,000, with the privilege of increasing same not to exceed $2,500,000. Incorporators: Mrs. Lily Roberts, Lilly B. Roberts, Alma Roberts, Anne Roberts, Frank Roberts, William Roberts of Lowndes County, Ga., and B. P. Rucker, Schenectady, N. Y.

***Bluff City Railway, Natchez, La.**—Incorporated with a capital stock of $25,000. Incorporators: Mrs. Fannie McM. Rumble, Mrs. Emma C. Wendel, A. L. Rumble and David M. Dix.

FRANCHISES

Evanston, Ill.—The City Council of Evanston has refused the request of the Chicago, Fox Lake & Northern Electric Railway for a franchise to build a line to connect with the Northwestern Elevated Railroad at Howard Avenue, and a new ordinance will be presented to the Aldermen for action at a future meeting. [Jan. 20, '17.]

Harvard, Ill.—The Chicago, Harvard & Geneva Lake Railway has been granted a franchise by the City Council of Harvard on West Front Street from Eastman Street to connect with its line at Diggins Street near the Lawrence crossing.

Indianapolis, Ind.—The Terre Haute, Indianapolis & Eastern Traction Company has asked the Board of Public Works of Indianapolis for permission to construct an additional track on its Terre Haute division from Holmes Avenue to Walnut Street and west from that point to Concord Street, thence northwest over the company's private right-of-way to the Indianapolis motor speedway.

Kansas City, Mo.—An ordinance has been introduced in the City Council providing for the routing of thirty-two car lines of the Kansas City Railways in Kansas City. Routings of eighteen of these remain unchanged, one new line is provided for and a new trunk line created. New routings are provided for the other lines when certain connections, loops or extensions have been completed.

Richmond Heights, Mo.—The Board of Aldermen of the City of Richmond Heights has granted a franchise to the United Railways for the construction of a line through the eastern part of Richmond Heights, north and south.

Rochester, N. Y.—The Board of Estimate and Apportionment at a recent meeting approved the ordinance adopted by the City Council on June 27, 1916, granting the New York State Railways additional franchise rights and extensions in Plymouth Avenue and across Brooks Avenue, where retracking has been in progress for some time.

Columbus, Ohio.—The Columbus Railway, Power & Light Company has asked the City Council for a franchise to double-track Grant Avenue from Chittenden Avenue to Eleventh Avenue, and to construct a line thence on Eleventh Avenue to the state fair grounds.

Columbus, Ohio.—The City Council of Columbus has instructed City Attorney Scarlett to prepare a franchise for a line connecting Chittenden Avenue and Eleventh Avenue on the payment of $5,000 to the city. This provides for the first cross-town line in the city. It is now in the hands of the street railway committee.

Johnstown, Pa.—The Johnstown Traction Company has asked the City Council for franchises to construct a line in the Seventh Ward and another in the Seventeenth Ward of Johnstown. In return for the franchises the company is willing to give the city 50 acres of land for park purposes.

TRACK AND ROADWAY

***Edmonton, Alta.**—It is reported that the Delta Copper Company, 703 Teglar Block, Edmonton, Alta., plans to construct a 3½-mile aerial tramway and power plant at Skeena Crossing. H. E. Clements, Skeena Crossing, engineer.

Coal District Power Company, Fort Smith, Ark.—In reply to an inquiry, Albert Emanuel Company, Dayton, Ohio, advises that the plans of the Coal District Power Company, recently organized at Fort Smith, do not include the construction of an electric railway, as noted in the ELECTRIC RAILWAY JOURNAL for Feb. 24.

Visalia Electric Railroad, Exeter, Cal.—This company's extension from Exeter to Porterville has been completed with the exception of 2 miles, near Strathmore. The line from Porterville has been built to a point 4 miles south and the right-of-way has been secured for 5 miles more. The company plans to begin construction work on this section in the spring, and it is expected the line will be completed next fall. The route from there as contemplated takes the line west 1 mile, and then south to a point directly east of Ducor. In all probability the line will connect with the Southern Pacific Company at or near Ducor.

Los Angeles (Cal.) Railway.—An application for authority to discontinue the operation of its cars on Vermont Avenue beyond the El Segundo branch of the Pacific Electric Railway and on Moneta Avenue south of the same line has been filed with the Railroad Commission of the State of California by the Los Angeles Railway. The company states that traffic does not warrant the continuance of service on these lines.

Pacific Gas & Electric Company, Sacramento, Cal.—The Sacramento electric railway system of the Pacific Gas & Electric Company will be increased by a short stretch of line built by the Southern Pacific Company, if an application is granted which is now before the California Railroad Commission, requesting permission to transfer the property. The application states that the line, which was built in 1905 by the Southern Pacific Company, the present owners, and has been operated since by the Pacific Gas & Electric Company as a part of its Sacramento system, has never paid operating expenses and fixed charges. The original cost of the road is given as $37,447, and the present value is $12,120, which is the price involved in the proposed transfer.

San Diego (Cal.) Electric Railway.—This company will construct a new track crossing at Fifth and Market Streets to cost about $18,000.

Denver (Col.) Tramway.—Announcement has been made that engineers of the Denver Tramway are planning a survey of several routes into Denver's mountain park system over which tracks might be laid and a study will be made of the possible revenue for the purpose of determining the feasibility of giving complete tramway service between the city and the big municipal playground.

Arkansas Valley Railway, Light & Power Company, Pueblo, Col.—This company reports that during the next seven weeks it will award contracts for the construction of 12,000 ft. of new track, including special work.

Capital Traction Company, Washington, D. C.—Orders have been placed by the Capital Traction Company for the necessary material to construct about 1 mile of track on Eighteenth and Nineteenth Streets and Virginia Avenue, northwest.

Miami (Fla.) Traction Company.—A special city election will be held in Miami to determine upon which streets the Miami Traction Company shall extend its lines this year. Under the terms of the franchise, one mile of track is laid each year, and as there is dissension as to the direction in which this year's extension shall be built, the Council has passed the matter on to the voters for decision.

Bloomington & Normal Railway & Light Company, Bloomington, Ill.—This company reports that in connection with the repaving of Front Street it will reconstruct its track from Main to Gridley Street.

Alton, Jacksonville & Peoria Railway, Alton, Ill.—This company plans to reballast and lay new ties on its line between Alton and Jerseyville.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company will construct two extensions to its West Michigan Street line.

Springfield (Mass.) Street Railway.—Work will be begun in April by the Springfield Street Railway on its proposed extension on Carew Street from Chestnut Street to Liberty Street, about 1 mile.

Columbus Railway, Light & Power Company, Columbus, Miss.—This company is constructing an extension to the plant of the Columbus Lumber Company in the northeastern suburbs of the city.

United Railways, St. Louis, Mo.—Acquisition of a strip of land on Etzel Avenue, from Hodiamont Avenue to the Hodiamont right-of-way, by the United Railways, has disclosed plans of the company to remove the tracks from Hamilton north of Etzel Avenue. The intention is to operate the Hamilton cars north of Etzel Avenue over the Hodiamont tracks. The company proposes laying tracks from Hodiamont and Etzel Avenues over the purchased strip to the Hodiamont tracks on the private right-of-way.

Brooklyn (N. Y.) Rapid Transit Company.—The Public Service Commission for the First District of New York has awarded to the Thomas Crimmins Contracting Company, New York, at $165,409, the contract for the relocation of the street surface railroad tracks on New Utrecht Avenue, Brooklyn.

Cleveland (Ohio) Railway.—It was announced on March 15 that the Cleveland Railway will begin the construction of an extension of the Pearl Road line to Ridge Road on April 1. Since the line penetrates a new section, where new allotments are being developed, the property owners raised $25,000 toward the cost of construction.

Oklahoma Union Railway, Tulsa, Okla.—It is reported that the Oklahoma Union Railway has purchased the Sapulpa Electric Interurban Railway and through interurban service between Tulsa, Sapulpa and Kiefer will be established about midsummer. Extensive improvements, both in Sapulpa and on the interurban line to Kiefer, will be made at once by the company.

Portland Railway, Light & Power Company, Portland, Ore.—Officials of the Portland Railway, Light & Power Company state that no immediate rerouting or diversion of traffic is contemplated under the act of the City Council in permitting the company to install a looping arrangement between First and Second Streets on Yamhill Street. The company merely desires to be prepared to handle traffic over this loop when conditions demand it, and also to be able to install the necessary turnouts and special work that may be needed in the future, at the time the present pavement is relaid.

Phoenixville, Valley Forge & Strafford Electric Railway, Phoenixville, Pa.—Work will soon be begun by this company on the construction of an extension to Norristown via Mont Clare and Jeffersonville.

Eastern Pennsylvania Railways, Pottsville, Pa.—This company plans to construct an extension from St. Clair or Fracksville to Ashland.

Womelsdorf, Richland & Myerstown Street Railway, Womelsdorf, Pa.—Work has been begun by this company on the construction of its line between Womelsdorf and Myerstown, via Newmanstown, Sheridan and Richland, and it is expected that operation between Womelsdorf and Sheridan will be begun by July 1. Leroy R. Valentine, Womelsdorf, president. [Oct. 28, '16.]

Columbia Railway, Gas & Electric Company, Columbia, S. C.—This company plans to construct an extension of its line on Hardin Street.

Dallas (Tex.) Northwestern Traction Company.—E. P. Turner, president of this company, accompanied by E. P. De Mayo, contracting engineer, and a party of fourteen Dallas business men, stockholders in the company, made an inspection trip over the route of the projected line, which is to extend from Dallas northwestward through Denton, Krum and Slidell. Meetings were held in the various towns and plans for building the line were discussed with the business men of the various sections through which the line will extend. [Feb. 17, '17.]

Texas Electric Railway, Dallas, Tex.—Officials of the Austin Chamber of Commerce have been in conference with J. F. Strickland, president of the Texas Electric Railway, with a view to offering sufficient inducements to bring about the extension of the Texas Electric Railway from Waco southward through Temple, Granger and Taylor to Austin. It is reported that a line is practically assured in that part of Texas to be built during the summer months.

SHOPS AND BUILDINGS

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has asked for the consent of the Sinking Fund Commission to the taking of a portion of the unused part of the Jerome Avenue reservoir tract in The Bronx for storage-yard purposes for subway cars in connection with the operation of the Jerome Avenue extension of the Lexington Avenue subway.

Nipissing Central Railway, North Cobalt, Ont.—The carhouse of the Nipissing Central Railway at North Cobalt was recently damaged by fire. The loss to electrical equipment is placed at $30,000, to cars $60,000 and to the building $40,000.

Portland Railway, Light & Power Company, Portland, Ore.—George M. Post, architect, of Salem, has been commissioned to prepare plans and specifications for a two-story building, 53 ft. x 90 ft., of brick and mill construction, to be built for Steusloff Brothers, Liberty Street, Salem. The first floor and part of the basement will be used as the general offices of the Portland Railway, Light & Power Company.

POWER HOUSES AND SUBSTATIONS

Arkansas Valley Railway, Light & Power Company, Pueblo, Col.—The electric light plants at Ordway and Sugar City have been purchased by this company. A new district will be formed by the company to include Olney Springs, Crowley, Ordway and Sugar City, with headquarters at Ordway. Many improvements will be made in the two plants. The company contemplates an 11-mile extension of the transmission line from Avondale to Boone and from Boone to the ranch of the Thatcher Cattle Company, where power will be furnished for a 400-acre irrigation project. It is probable that a street-lighting system will be installed at Boone.

Tampa (Fla.) Electric Company.—This company plans to double the output of its West Jackson Street power house. The work will include an addition to the building and the installation of an additional 7200-kw. steam turbo-generator.

Boston (Mass.) Elevated Railway.—A contract has been awarded to the Westinghouse Electric & Manufacturing Company by the Boston Elevated Railway for a 25,000-kw. turbine, a 25,000-kw. turbine generator, and a 25,000-sq. ft. condenser.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.—It has been announced that this company will construct a $50,000 power plant at St. Joseph.

Atlantic Coast Electric Railway, Asbury Park, N. J.—A report from the Atlantic Coast Electric Railway states that it expects to construct an addition to the boiler room at its power station, and will install four Badenhausen boilers, aggregating 2440 hp., stokers, etc.

Columbus, Delaware & Marion Railway, Cincinnati, Ohio.—In connection with the reorganization of the Columbus, Delaware & Marion Railway and its allied properties, it is stated that Frank G. Glosser, superintendent of the Marion lighting department, has submitted recommendations for a large power plant, to be erected as soon as the receivership is lifted and reorganization effected. Mr. Glosser, it is reported, suggests that the power station be located at Newman's, 8 miles south of Marion. The cost of the proposed plant is estimated at $90,000.

Scranton & Binghamton Railway, Scranton, Pa.—This company contemplates the erection of a 66,000-volt electric transmission line from the present terminal in Tiany to Binghamton during the present year.

Manufactures and Markets

Discussions of Industrial Conditions
A Department for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Business Announcements Trade Literature

Co-operation Among Manufacturers Brings Results

Associated Manufacturers of Electrical Supplies Hold Annual Meeting in New York—Review of Progress Made

The third annual meeting of the Associated Manufacturers of Electrical Supplies was held March 15 at Delmonico's, New York. This organization was formed during the early part of 1915 and according to President Robert K. Sheppard, "The impulse came to the manufacturers after the discovery by many simultaneously that an emergency could confront them suddenly and might be followed by serious consequences if they lacked machinery with which to bring their members together for collective action."

The objects of the association as given in the constitution are to advance and protect the interest of the manufacturers of electrical supplies and of the manufacturers of materials entering into electrical construction, in manufacturing, engineering, safety and other problems, to promote the standardization of electrical materials, to collect and disseminate information and to promote co-operation among the members.

In the absence of President Robert K. Sheppard, sales manager Simplex Wire & Cable Company, Boston, Mass., his report was read by the vice-president, H. B. Crouse, Crouse-Hinds Company, Syracuse, N. Y. He said, in part:

"The promotion era of the electrical industry is over. For it the age of wonders still holds some secrets, but when disclosed they will constitute refinements of the art, rather than fundamental forces in this enormous business.

"In the last thirty years electric power, light, transportation, the telegraph, the telephone could not be provided too fast. The world was quick to speed up proportionately in the race for domination of nature's forces and the achievement of wealth and material comfort. Magical expansion was accompanied by almost uncanny prosperity, in which phenomenal profits completely buried the unsuspected losses due to waste and a total disregard of the ratio of cost to selling prices.

"But that period has passed. The spendthrift manufacturer, the blind adopter of his competitors' market values and methods, can no longer find shelter from the financial cyclone. Our industry has trodden the same historic path which has forced every other basic industry to a closer and closer study of the costs of production and the costs of distribution."

J. F. Kerlin, National Carbon Company, presented the report of the finance committee, which showed all indebtedness paid and a cash balance on hand. The committee felt that this report was due to the efficiency of the treasurer, J. W. Perry, of the H. W. Johns-Manville Company.

According to Charles E. Dustin, the general secretary, "Many lines of activities have been undertaken by the sections, of which there are fifteen, during the year, and after acting upon the ordinary topics of standardization of design, as well as matters of interest with the Underwriters' Laboratories, many of the sections have now specifically taken up the compilation of statistics pertaining to product handled by the members, figures being first submitted to the general secretary and tabulated by his office and the net results given to each of the members, without disclosure of the name of the individual manufacturer.

"Much progress has been made by co-operation of the manufacturers in the matter of a uniform basis for figuring costs. For this purpose articles manufactured by different members have been specified and costs submitted through the office of the general secretary. It is interesting to note that these figures have shown a variation of from 25 per cent to 40 per cent, indicating an improper distribution of expense items, and proving conclusively the necessity of adopting a uniform basis of cost accounting.

GOVERNORS RE-ELECTED

Five members of the board of governors whose terms expire were re-elected for three years from April 1, 1917, as follows: A. W. Beeresford, Cutler-Hammer Manufacturing Company; L. W. Downes, D & W Fuse Company; E. B. Hatch, Johns-Pratt Company; B. E. Salisbury, Pass & Seymour, Inc., and R. K. Sheppard, Simplex Wire & Cable Company.

At the banquet on the evening of March 15, T. M. Debevoise was the toastmaster and the speakers were Edward N. Hurley, retiring chairman of the Federal Trade Commission and the Hon. Job E. Hedges, who made a stirring patriotic address. Mr. Hurley said in speaking of the duty of business men to safeguard their own interests:

"One of the real needs among American business men to-day is a broad view of business and a comprehensive grasp of industry as a whole. Too many American manufacturers and merchants center all their energy and attention upon their particular establishment and the work of making profits for it. Men at the head of factories need the point of view of what might be termed as the 'statesmanship of business.' They need to appreciate the fact that their plant is only a part of a great industry; that their individual welfare depends very largely upon the welfare and progress of the whole industry and of industry in general."

Save Profits Instead of Making Them

Buying in War Market Costly—Economies Effected in Saving—Right Buying a Study

By W. H. Smaw

Purchasing Agent, Georgia Railway & Power Company

Everyone interested can see how the accompanying figures affect the cost of every article used by this company, as these metals enter in some way into the manufacture of every piece of apparatus used. This page could easily be filled with comparisons. Not one single item bought by this company has gone down in price. Not one has remained stationary. Every solitary one has gone up from 25 per cent to 300 per cent.

Regulated and right buying is a study in economics, but economy can be effected in other ways: By saving, by using what we have instead of ordering new material where the old will do, and by careful inspection of everything before it is consigned to the scrap heap.

Table Showing Increase in Price of Metals and Iron and Steel Products Since the Beginning of the War

Metals	Increase in Per Cent
Lake copper	160
Electrolytic	173
Casting	156
Tin	37
Lead	95
Spelter	169
Aluminum	271
Antimony	164
Sheet copper	127
Copper wire	184
Sheet zinc	200

Pig Iron	Increase in Per Cent
No. 2 foundry, Birmingham	92⅓
Iron and Steel Products	
Bars	152
Plates	204
Shapes	161
Pipe (¾ in. to 3 in.)	62
Wire (nails)	94
Sheets	122
Tin plates	112

If one looks over the field of endeavor connected with production and manufacturing and observes its tendency during the past decade, it will be noted that intensive economical operation is applied more closely as time goes on, until the condition exists with many concerns that they save their profits instead of making them. General bulletins have been issued by many of the steam and electric roads and other industries, calling attention to the conditions now existing, demanding the practice of the strictest economy in the use of materials and recommending that all changes and repair work be held in abeyance until prices change.

When some careful thought to the prevailing conditions is given, one can understand why our managements wish us to practice economy. We suffer as does the individual, since we are consumers, strictly speaking. It is obvious that this increased cost is being absorbed by us and cannot be placed on the shoulders of our customers, as is being done by every other line of business. Our car fare is still a nickel, and our charges for electric current remain the same. Until recently we were pretty well protected by contracts made long ago and by heavy purchases that anticipated the enormous increases in cost. Now, however, we are face to face with the new conditions. From now on we are buying in the war market.

Increased Prices in Cleveland

Unit Prices Given for Three Years with the Per Cent Increase for the Period 1910-1916

In the recently issued annual report of the Cleveland Railway Company attention is directed to the "continual advance in wages and in the prices of materials." These figures, which were prepared under the guidance of John J. Stanley, president of the company, no doubt are representative of similar changes which have been effective on other properties. The following table shows the average rate of wages paid during 1910, when the "Tayler franchise" went into effect, the rate paid during 1913, which was the year before the war, and the rate paid during the latter part of 1916. The prices of different materials used in large quantities by the Cleveland Railway Company during those years are also given.

TABLE SHOWING RATE OF WAGES, PRICE OF MATERIALS AND PERCENTAGE INCREASES DURING 1910, 1913 AND 1916

	1910	1913	1916	Percentage Increase 1916 Over 1910	Percentage Increase 1916 Over 1913
Wages of trainmen, per hour	$0.25	$0.29	$0.33	32	14
Track labor, per hour	.18	.20	.22½	25	12½
Shopmen, per hour	.24	.26	.32	33	26½
Brass, per pound	.18½	.21	.29	56½	38
Steel car wheels, each	...	14.00	17.50	..	25
Cement, per barrel	1.20	1.49	1.84	53	23½
Copper, per pound	.14	.18	.44½	217½	147
Galvanized span wire, per 100 ft.	1.62	1.53	3.35	100½	119
Gears, each	12.10	26.35	27.53	127½	4½
Rail per ton, f.o.b. Cleveland	...	39.55	50.55	..	27½
Bar iron, per hundredweight	1.80	2.10	2.50	38½	19
Paving brick, per thousand	13.00	16.50	18.00	38	9
Pinions, each	1.75	2.84	4.63	164½	63
Steel, per hundredweight	1.90	2.24	6.80	257½	203½

Uniform Size for Catalogs and Advertising Literature

BY W. L. CHANDLER

Assistant Treasurer, Dodge Manufacturing Company, Mishawaka, Ind.

I have been interested in Mr. Dunbar's communication in your issue of March 10, and appreciate the cooperation of the ELECTRIC RAILWAY JOURNAL in helping to bring about a reform in the catalog field.

The particular size of the master catalog is not so important just at this moment. To my mind, the most important phase of the whole matter is to get the buying and selling interests of the country together and get them to decide upon that which is best.

Using a vertical letter file, there is nothing to prevent us putting in that file printed matter of sizes smaller than the size of the file, so that the principal concern will be that of having the file large enough to take the largest size pamphlet. However, if they could all be of one uniform size the convenience of the buyer would be very largely increased. If I were a salesman or sales manager, and knew that a buyer had a file of this kind, I should promptly forget the cost of the paper for my little troubles, and bend every effort to place my printed matter in such form and size that it would best serve the convenience of the buyer, so that when he went to the file looking for material in this line, my printed matter, being most convenient for him, would be likely to be used by him.

The cost of getting out printed matter consists of the gathering of the information, printing, cost of distribution, and waste when it reaches the buyers' hands. When a sales manager considers all of these various factors he will very quickly realize that the cost of paper and the labor of enclosing sink into insignificance in comparison with the chance of loss through failure to command the respect of the buyer when in the market.

I am preparing an article now which I shall send you very shortly, showing what can be done in one industry toward preparing a standardized index, which is one of the most important features of a master catalog. I am hoping that this suggestion will result in considerable discussion, because the index is an item which will require a great deal of thought before it is perfected.

I have received samples of Mr. Montgomery's folder file. This is quite along the plan I had in mind, although no great value will result from the use of this form of printed matter until the standards are finally established, so that the buyers are all equipped to handle them.

CURRENT PRICES FOR MATERIALS

Quoted Wednesday, March 22

Copper (electrolytic)	New York, 36 cents per pound
Rubber-covered wire (base)	New York, 42 cents per pound
No. 0000 feeder cable (bare)	New York, 42 cents per pound
No. 0000 feeder cable (stranded)	New York, 39¾ cents per pound
No. 6 copper wire (insulated)	New York, 39½ cents per pound
No. 6 copper wire (bare)	New York, 42 cents per pound
Tin (straits)	New York, 56 cents per pound
Lead	New York, 9½ cents per pound
Spelter	New York, 10⅝ cents per pound
Rails, A. S. C. E., O. H	Mill, $40 per gross ton
Rails, A. S. C. E., Bess	Mill, $38 per gross ton
Wire nails	Pittsburgh, $3.20 per 100 pounds
Railroad spikes, 9/16 in. and larger	Pittsburgh, 3.65 cents per pound
Steel (bars)	Pittsburgh, 3¾ cents per pound
Sheet iron (black, 24 gage)	Pittsburgh, 4.85 cents per pound
Sheet iron (galv., 24 gage)	Pittsburgh, 6.55 cents per pound
I-beams over 15 in.	Pittsburgh, 10 cents per pound
½-in. galv. extra high strength steel wire,	New York, $7.04 per 100 ft.
⅜-in. galv. high strength steel wire	New York, $3.52 per 100 ft.
⅜-in. galv. Siemens-Martin wire	New York, $2.60 per 100 ft.
5/16-in. galv. Siemens-Martin wire	New York, $2.00 per 100 ft.
Galvanized barb wire and staples	Pittsburgh, 4.05 cents per pound
Galvanized wire (ordinary)	Pittsburgh, 3.85 cents per pound
Cement (carload lots) with rebate for sacks,	New York, $2.02 per barrel
Cement (carload lots)	Chicago, $2.06 per barrel
Cement (carload lots)	Seattle, $2.60 per barrel
Sand in large lots	New York, 50 cents per ton
Waste, No. 1 white	New York, 14 cents per pound
Linseed oil (raw, 5-bbl. lots)	New York, $1.01 per gallon
Linseed oil (boiled, 5-bbl. lots)	New York, $1.02 per gallon
White lead (100-lb. keg)	New York, 10¼ cents per pound
Turpentine (bbl. lots)	New York, 47½ cents per gallon

OLD METAL PRICES

Copper (heavy)	New York, 29 cents per pound
Copper (light)	New York, 24¾ cents per pound
Red brass	New York, 20 cents per pound
Yellow brass	New York, 19 cents per pound
Lead	New York, 8 cents per pound
Zinc	8 cents per pound
Steel car axles	Chicago, $38 per net ton
Iron car wheels	Chicago, $21 per gross ton
Steel rail (scrap)	Chicago, $26.50 per gross ton
Steel rail (relaying)	Chicago, $34 per gross ton
Machine shop turnings	Chicago, $9.50 per net ton

ROLLING STOCK

Reading Transit & Light Company, Reading, Pa., is reported to be in the market for fifteen city cars.

Alabama City, Gadsden & Attalla Railway, Gadsden, Ala., has ordered one double truck car from The J. G. Brill Company.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., has ordered six cars from the Wason Manufacturing Company. They will be equipped with G. E. motors and the Philadelphia Holding Company's Radial trucks.

New York State Railways, Rochester Lines, Rochester, N. Y., has placed an order with the Cincinnati Car Company, through W. R. Kerschner, 50 Church Street, New York, for twenty-five 50-ft. Peter Witt cars. These cars will be similar to the fifty cars purchased from this company in 1916.

Charleston (W. Va.) Interurban Railroad has purchased one 45-ft. baggage-express car from the Cincinnati Car Company. This car will be equipped with four Westinghouse 306 motors and HL control, Westinghouse AMM brakes, Tomlinson couplers and Baldwin K-76 trucks.

Stone & Webster Management Association, Boston, Mass., has purchased eight Birney cars from the St. Louis Car Company, and has practically closed contract for twenty-four similar cars, for service in Bellingham and Tacoma districts, on the lines of the Puget Sound Traction, Light & Power Company.

Lehigh Valley Transit Company, Allentown, Pa., has ordered from The J. G. Brill Company twenty-four 47-ft. center-entrance, front-exit, double-end closed passenger cars, which will be used in suburban service to Catasauqua, Northampton, Bethlehem, South Bethlehem and Allentown. The cost of these cars will be approximately $10,000, as against $6,500 for the same type of car ordered three years ago.

Citizens Traction Company, Oil City, Pa., has ordered from the J. G. Brill Company three single-truck, all-steel, one-man cars for use in Oil City. The cars will have the Safety Car Appliance Company's dead man features and will be air operated. They will be equipped with Westinghouse No. 514-A motors with double-end K-36-J control and with Brill type 21-E trucks.

New York State Railways Syracuse Lines, Syracuse, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of March 17 as having placed an order with the G. C. Kuhlman Car Company for twenty-five double-truck cars, has specified the following details for this equipment:

Type of car	Front End-Center Exit (Peter Witt)
Seating capacity	51
Weight (total)	34,500 lb.
Bolster centers, length	25 ft.
Length over bumpers	47 ft. 7 in.
Width over all	8 ft. 3 in.
Height, rail to trolley base	11 ft.
Body, wood, semi-steel or all steel	Semi-steel
Interior trim	Cherry
Headlining	Agasote
Roof, arch or monitor	Arch
Control, type	West.-HLD
Couplers	Tomlison
Designation signs	Keystone
Door operating mechanism	National Pneumatic
Fare boxes	Johnson
Fenders or wheelguards	Eclipse
Gears and pinions	Tool steel
Hand brakes	Peacock
Heaters	Peter Smith
Headlights	Crouse Hinds
Journal boxes	Brill
Lightning arresters	Westinghouse
Motors, type and number	West. 506A
Motors, outside or inside hung	Inside
Paint, varnish or enamel	Flood & Conklin
Registers	International
Sanders	Ohio Brass
Sash fixtures	Kuhlman
Seats, style	Cross and Longitudinal
Seating material	Seat cane
Step treads	Feralun
Trolley catchers or retrievers	Earll
Trolley base	U. S. 13
Trolley wheels or shoes	Wheels
Trucks, type	Brill 67 F
Ventilators	Automatic
Wheels (type and size)	26 in. cast iron

TRADE NOTES

Southwest General Electric Company, Oklahoma City, Okla., will move its branch office from 402 Insurance Building to 301-302 Terminal Building.

John L. Fay, sales manager for the Paducah Pole & Timber Company, is back at his work after six weeks confinement in the St. Louis Hospital, where he had an operation performed.

Wendell & Mac Duffie Company, New York, N. Y., announce that an order has been received from the Public Service Railway for fifty sets of H. B. Life Guards for its fifty new cars now under construction.

William E. Copeland, for the past several years in charge of the New Orleans office of the Westinghouse Lamp Company, has been transferred to the New York office and in the future will have charge of the company's sales in the uptown district of Manhattan.

Mathias Klein, having attained the age of ninety years, has retired from business and transferred his interest in the firm of Mathias Klein & Sons to his sons John M. and Joseph A. Klein who will continue the business under the present title of Mathias Klein & Sons.

W. S. Rugg, formerly district manager of the New York office of the Westinghouse Electric & Manufacturing Company, has succeeded Charles S. Cook as manager of the railway department with headquarters at East Pittsburgh. Mr. Rugg is a graduate of Cornell University and has been with the Westinghouse company for many years. At one time he was connected with the Chicago office but has been associated with the New York office since 1901. E. D. Kilburn, manager of the power department of the Westinghouse New York office, has been appointed district manager to succeed Mr. Rugg.

Combustion Engineering Corporation, New York, N. Y., announces that Walter H. Wood, mechanical engineer, has become associated with its staff of combustion experts. Mr. Wood has been associated with his brother, A. C. Wood, consulting engineer of Philadelphia, for a number of years. He was also engaged by the American Writing Paper Company, Holyoke, Mass., to make a special study of combustion problems, and was later made superintendent of power plants of the Baltimore & Ohio Railroad Company, which connection he severs to enter the employ of the Combustion Engineering Corporation as engineer of tests and research. This latest move on the part of the Combustion Engineering Corporation, which in the last three years has four times doubled its capacity for output of the various kinds of stokers that it manufactures, further emphasizes its policy of service and equipment to handle any combustion problems that may be presented.

Horne Manufacturing Company, Brooklyn, N. Y., announces the receipt of the following orders: Fifty Q-P trolley catchers from the Kuhlman Car Company for the International Railway and fifty direct from the International Railway; ninety air cleaners from the Westinghouse Air Brake Company for the following properties: International Railway, Ogden, Logan & Idaho Railway, Conestoga Traction Company, Roanoke Railway & Electric Company, and the Bay State Street Railway; 100 Giant brakes from the Cincinnati Car Company for the new cars of the Public Service Railway, twenty direct from the Public Service Railway, six from the Johnstown Traction Company, and six from the Norfolk & Bristol Street Railway; 312 hydrogrounds for the Sao Paulo Tramway Company, Union Electric Light & Power Company, and Binghamton Light & Power Company. The company has also received orders for miscellaneous copper spinnings from the Third Avenue Railway Company, the principal ones being for twenty-five storage battery car headlights, and 200 indicator lamp shades.

ADVERTISING LITERATURE

Drew Electric & Manufacturing Company, Indianapolis, Ind., has issued a bulletin on its protective and reclaiming pole sleeves.

American Engineering Company, Philadelphia, Pa., has issued a bulletin describing and illustrating the Taylor power dump.

Automatic Ventilator Company, New York, N. Y., is distributing a pamphlet illustrating its renewable steel bushings used in reclaiming old controller handles.

Hess-Bright Manufacturing Company, Philadelphia, Pa., is distributing an illustrated bulletin descriptive of ball bearings in machine tools.

Day & Zimmermann, Philadelphia, Pa., have issued a map of the United States showing the location of engineering projects constructed or managed by this company.

Chicago (Ill.) Steel Post Company is distributing catalog No. 17 on its steel fence and fence-posts. In addition to illustrations of this type of fence, methods of fence building are described in detail.

Ohio Brass Company, Mansfield, Ohio, is distributing a well illustrated and prepared bulletin, "Steam Road Electrifications." Seventeen of the most important electrifications, including the Chicago, Milwaukee & St. Paul Railway and the Norfolk & Western Railway, are illustrated and described.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has just issued catalog 5-B on accessories for use on railways, including circuit breakers, fuse boxes, resistors, connectors, etc. This catalog is issued as a section of its general supply catalog. In addition to these accessories, illustrations are also given of the Rico coasting time recorder which records actual number of minutes an electric car or train is operated while coasting, without the use of power or brakes.

Electric Railway Journal

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Consolidation of Street Railway Journal and Electric Railway Review

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SIX-CENT FARES ADVOCATED FOR BOSTON

We are glad that President Brush of the Boston Elevated Railway told the legislative committee which is considering that company's economic status that 6-cent fares must come as the ultimate solution of Boston's transportation problem. This is the first time, so far as we recall, that this statement has been made positively at a public hearing by the official of any large city railway system. Six-cent fares have been adopted on some suburban lines, but there has been an undercurrent of feeling among many railway officials that another cent would be too much of a demand to make and would also present difficulties of collection. These two objections, however, do not seem so great on consideration. The increase, it is true, amounts to 20 per cent, but a great many articles which the public has to buy have increased in price more than 20 per cent within recent years. The same, of course, is true in regard to the materials which the railway companies have to buy. As for the difficulties of collecting a 6-cent fare, a conductor may be obliged to make a little more change, but with prepayment operation there is reason to believe that people will be as ready to supply themselves with coppers as well as nickels, and put 6 cents in the box without asking the assistance of the conductor as they are now to put in 5 cents. Finally, there should be no mechanical difficulty in making a fare box to register the extra cent. In civil war times the fare on a great many roads was 6 cents, and in this era of high prices 6 cents for a car ride ought not to appear unreasonable in those cases where a railway company can prove it is necessary as a solution of its financial problem.

SPLIT PHASE FOR SUBURBAN SERVICE

There has been raised the question whether the split-phase equipment with induction motors, which has been proved so satisfactory on the Norfolk & Western's electrified freight division, could be used to advantage in suburban service. Apparently, such an application would be undesirable, not so much because the equipment would require the use of locomotives but rather because of its lack of efficient utilization of power during acceleration. With the induction motor, whose free-running speed is fixed, not by the load but by the frequency of the alternating-current supply, acceleration on resistance must be carried through the entire range between zero speed and synchronous speed, whereas with the commonly used series motor an appreciable part of the acceleration may be made without resistance and at relatively high efficiency. In addition there are inherently increased losses with the induction motor during acceleration, which must be carried out by introducing internal resistance in the rotor and adding to the "slip," as opposed to the variation in voltage (through the introduction of external resistance) used with motors of the series type. For suburban service, where a large part of the current is consumed in acceleration because of the frequent stops, efficiency of acceleration may play an important part in affecting the total input of energy, and since estimates place the range of increase in current consumption during acceleration with the induction motor between 20 per cent and 45 per cent, depending upon relative length of run between stops, suburban service seems hardly likely to become a satisfactory field for it.

INSURANCE COMPANY HOLDINGS

Insurance companies are real investors, and their relative preferences for various classes of securities constitute good evidence of investment values. In considering their holdings, however, it must be remembered that they have not the same freedom as a private investor in effecting a compromise between a high return and safety of principal with stability of income. Hence it is not surprising that, as pointed out elsewhere in detail, insurance companies with more than 97 per cent of the total admitted assets of all American companies decreased their stock holdings during the period 1904-1914 by $50,000,000, or almost 40 per cent, while increasing their mortgage, policy loan and bond holdings. Nor—to disregard the policy loans and the like, which are controlled by policyholders and not by the investment officials of the companies—is it surprising that the great advance of the decade should have been in state, county and municipal bonds, to the extent of $371,000,000 or 227.59 per cent. Such bonds have a safety and stability that have not yet been fully granted to railroad and utility bonds in exchange for the restriction of return under regulation. Bonds of the latter types, however, have been attractive as affording an opportunity for a diversifying of investments, and that many sound issues have been available is evidenced by the increase of $505,000,000 or 67.32 per cent in railroad bonds and $74,000,000 or 67.11 per cent in public utility bonds during the decade. The preponderance of railroad bonds is not unexpected, of course, in view of the relative youth of the utility industry. As for the future, we believe that railroad bonds will continue to have their appeal, and utility bonds increasingly so, but both will be handicapped just as much as public regulation limits return at the expense of safety. Public thought and effort should be directed toward minimizing such a handicap.

PLANNING FOR NATIONAL DEFENSE

In the work of national defense, electric railway companies will constitute an important part. They can help in three ways. In the first place they can arrange with the War Department so that the military authorities can utilize their lines to the greatest extent necessary for transportation of men and supplies; second, they can protect these lines so that transportation over them will be uninterrupted for both commercial and military purposes, and, third, they can assist through the services which individuals connected with the railways can render to the government in a military capacity.

Through its committee on national defense, the American Electric Railway Association is planning to assist the electric railways in carrying out the duty first mentioned. The first step in this consists of making a tabulation of the transportation facilities of the different companies and maps of their lines, the latter showing especially the possibility of trans-shipment over these lines without breaking bulk of troops and supplies from the steam railroads. This is a matter on which the railways can be of great assistance, and the prompt action of each company in answering the inquiries which will be sent to it by the association is most important. Further particulars of the data required are published elsewhere in this issue in the report of the meeting held on March 28 of the association committee on national defense.

As regards the second point, preparedness calls not only for the protection of the vital points on the lines, such as the power stations, substations, tunnels and bridges but provisions by which the service can be maintained even if a considerable part of the force is called away to do regular military duty. This means, as explained editorially in our issue of March 10, that each company should make its plans immediately for increasing its transportation and shop force by the employment of men beyond the military age or with some slight physical defects which would bar them from military service but not prevent efficient work on the railway, and even by the temporary substitution in many positions of women for men. The last plan, as is well known, has been used extensively abroad and may even be necessary here. Indeed, at least one company has already made an extensive study of this subject, planning the work where women substitutes can be used in place of men, looking into the laws governing the employment of women and designing a uniform which would be suitable for a woman conductor.

A third step which demands immediate consideration on the part of every individual connected with a railway company is: "How can I personally best serve my country in the emergency of war?" There is no doubt that the government will need many men in different lines of work and, as we have said before, the semi-military training of a railway man, as well as his expert knowledge of transportation matters, his engineering skill, or his mechanical ability, if a member of the shop force, means that the staff of a railway company can be of great assistance in the national defense. This does not mean, of course, that the best service which every railway man can give is in carrying a rifle or that so many men can leave as to cripple the service. Modern war is won quite as much in the shop at home producing munitions or in directing the transportation of men and supplies or in the military engineers' corps as it is on the firing line. But the government will need the services of a great many men in the case of war and large numbers of them will have to have the expert knowledge possessed by the members of an electric railway organization. By the substitute plan outlined, a considerable number can be spared from their present work, and these the government can use to advantage.

THE ADAMSON LAW AND ELECTRIFICATION

The Supreme Court's recent far-reaching decision on the Adamson law appears to us to have a bearing on the future of steam railroad electrification. This, it would seem, should come even if materially increased interest rates have to be paid after the war for the new capital required (although economists are by no means agreed that such increased prices for capital will be inevitable). The most important reason for this prophecy is that labor charges, which have been mounting steadily for several years, have become an almost insupportable burden upon the railroads, and with the right of wage regulation that has just been accorded to Congress the chances are very strong that still further wage increases will come.

Railroad trainmen are not likely to lose sight of the scare which, by means of a strike threat, they can throw at any time into a controlling body that is inherently timid because of its temporary tenure of office. Consequently, we feel that railroad wages will continue to rise until the day when there comes the unescapable knock-down-and-drag-out fight between the men and the roads—probably over a question of discipline. Even with the recent 20 per cent increase in wages (and the Adamson law provides for nothing but that, regardless of all attempts to obscure the issue by allusions to an eight-hour day) which has been granted to the trainmen, there must not be overlooked the fact that the railroads still have to deal with the shopmen and trackmen and freight handlers and several other classes of employees numbering three times more than the operating personnel. It is inconceivable that the trainmen can get away with a 20 per cent raise and leave the other employees satisfied with the existing wage scales. When these men have received their bit of the general prosperity, the operating charges on the average railroad, including the greatly increased costs for coal and other material, which so far have gone up in price even more rapidly than labor, will make any slightly higher interest charges look small by comparison.

If the railroads are to survive, and we presume that they will do that, they will have to have increased freight rates, but since this matter is not likely to be treated so open-handedly as labor has been, the roads must look for their dividends to improved operating methods.

This is the opportunity for electrification. Admittedly, the cost of its introduction is enormously heavy, but because of the higher schedule speeds that are possible with a locomotive that, unlike the steam engine, has an overload capacity for starting and for ruling grades and that has a wide range of speeds and loads for efficient operation, there is afforded an opportunity to strike at the major source of the increased operating expense, that is to say, labor charges. If freight trains are regularly moved at schedule speeds of 12½ m.p.h. or more, the effect of the recent wage increase can be largely offset. This is, probably, a practical impossibility with steam unless train tonnage and economy in fuel and repairs are heavily sacrificed. But under electric operation it should be easy, and at the same time enough saving in locomotive repairs should be made to pay many times over for the higher wages that are inevitably coming to the shopmen. In brief, the Adamson law will make the steam railroads begin to look more favorably than ever toward electrification.

PROGRESS IN ELECTROLYSIS STUDIES

The publication of an abstract of the preliminary report of the American committee on electrolysis in last week's issue of the ELECTRIC RAILWAY JOURNAL brings to the attention of the electric railway industry the result of four years of steady work by this national joint committee. This preliminary report was completed last fall and, although not officially "published," it is available to a limited extent in printed form. It it is now before the several interests represented on the committee for such action as they care to take.

The committee has had before it the task of digesting the information available as to methods of mitigating electrolysis trouble and eventually of formulating recommendations as to best practice along this line. A part of the four-year period was required for securing the interest and active co-operation of all the interests concerned in the matter and to organize the committee for work. The remainder of the time has been spent in collecting and studying data and in formulating the preliminary report. A sub-committee is now at work preparing recommendations which will form a part of the final report.

The preliminary report carries the notice that it includes only "statements of facts and does not attempt to draw conclusions or discuss questions of law." Of course, what we wish the committee to tell us eventually is how so to reduce stray currents and their effects as to eliminate all differences of opinion in any particular case as to what mitigating measures are to be taken and how the expense thereof is to be divided. But it must be remembered that there are a number of interests involved in this matter, and they must first agree on the facts before they can take up the matter of procedure. Hence this preliminary report is a distinct contribution to progress. The electric railway representatives on the committee have been Calvert Townley, Prof. A. S. Richey and R. P. Stevens. Bion J. Arnold, Paul Winsor, E. B. Katté, W. S. Murray and others on the committee, while representing other interests, are also familiar with the subject from the electric railway standpoint. This personnel is a strict guarantee to the electric railway industry that the work so far accomplished has been well done.

Naturally there is not much that can be done with a report of this nature except to study it and consider local conditions in the light of the facts summarized in it. The electrolysis mitigation problem cannot be ignored, nor can any one utility be expected to bear all of the expense involved in reducing it to an economic minimum. It should be a part of the duty of the electrical department of every electric railway operating over or near ground occupied by pipe to know the condition of the return circuit. A good return circuit obviously implies small leakage, everything else being equal. If a pipe-owning utility believes that excessive stray current exists in and around its pipe line, it should have the co-operation of the railway or railways in determining the facts and in prescribing the remedy if such proves to be needed. Where the circumstances warrant, an expert should be called into consultation. It is better for the utilities to get together in a friendly manner than to have recourse to outside bodies.

ENGINEERING SUBDIVISION FOR C. E. R. A.

The recent annual meeting of the C. E. R. A., concluding eleven years of most successful association work, was marked by a splendid spirit of communion and a sense of real achievement. The attendance at the three sessions was exceptionally large, but the small number of engineers present suggests the desirability of some plan by which the representatives of this branch of the industry in the central states could be brought together more frequently for conference on engineering subjects. Can this best be done by an engineering subdivision of the C. E. R. A., patterned somewhat upon the organizations possessed by the traffic men and accountants in the central states, or by devoting one or more meetings of the main association during the year to engineering discusions? The former plan has been suggested by several, and we are glad to report that President Wilcoxon says that he personally has no objection to such an organization if the engineer members of the association desire it, although the matter would naturally have to be approved by the executive committee before final action was taken. The project of an engineering subdivision appears to us as commendable. The papers at the last meeting of the Central Electric Railway Association were of especial engineering value and are good examples of the kind of papers which could well be discussed by the engineers of the member companies of the C. E. R. A.

During the present year an opportunity is being presented for a very important contribution by the engineers to prove the value of such a proposed section to the industry. The standard electrical safety code is out on a one-year's trial. If the engineers of the Central Electric Railway Association territory should study this code individually and in conference their criticisms and suggestions would be of especial value as representing the experience of this territory. This is only one of many special activities on which the engineers could well engage to the profit of the industry as a whole.

Handling Freight on a Southern Line

An Analysis of the Practices Which Are Attracting an Increasing Freight Traffic to the Birmingham Railway, Light & Power Company—Company Aims at Efficiency with Least Possible Red Tape

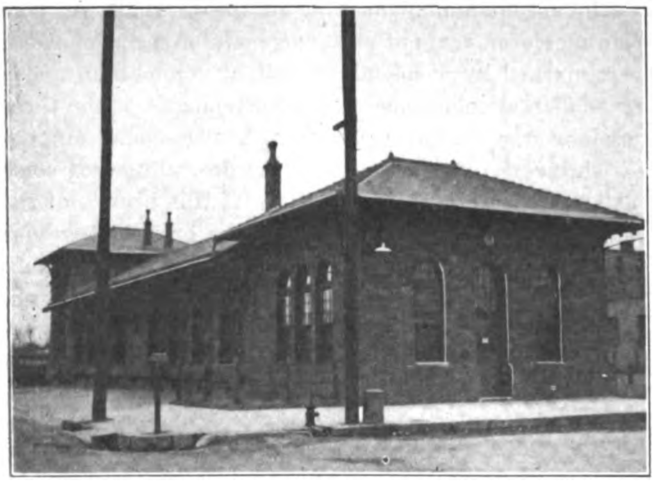
By T. G. BRABSTON
Freight Traffic Manager Birmingham Railway, Light & Power Company, Birmingham, Ala.

THE slogan of the freight department of the Birmingham Railway, Light & Power Company, Birmingham, Ala., is "Express Service at Freight Rates," and the service fully measures up to this standard in every particular. There are now on this property twelve trains daily operating in and out of the central terminal. Shipments are received at this station, the principal distribution point, up to fifteen minutes before the scheduled departure of trains.

Rapid Freight Receiving and Billing

The method of receiving freight at the central station, illustrated in an accompanying picture, differs somewhat from the practice usually observed, in that two 8-ft. platforms with a driveway and tracks on the outside are provided, both platforms and driveway being covered over. Teams all enter the shed from one direction, and large signs indicate, along these platforms, the principal points for which freight is accepted. The wagons zigzag through this driveway between platforms and distribute freight in front of cars for different destinations, as their loads may require, thereby putting the burden of the distribution on the wagons instead of hand trucks, as is usually the custom. By this method it is necessary only to move freight from the platform into the car opposite it, and a much smaller force of truck men is required. Two check clerks can dispose of a much greater number of wagons per hour by this method than is possible under the old practice. Moreover, the wagons are released promptly at the central station, it being an exception when a wagon is not released within fifteen or twenty minutes after its arrival at the station.

As rapidly as shipping orders are checked, they are passed into the office, where a tariff man assesses the charges. They are then passed along to the bill desk. The manibill system, with regular billing machines having special characters, is used. The machines have numerous keys carrying entire words. For instance, commodities frequently handled, such as meat, hardware, pipe, potatoes and fish, and articles such as boxes, barrels and packages, are written, "1 bbl. fish," "1 box meat," "1 bdl. pipe," without the clerk having to touch more than three keys. This facilitates billing, and two operators turn out from 12,000 to 15,000 bills a month. Three copies of bills are made at once, from a continuous roll passing through the machine. The first copy of this bill serves as a way-bill in transit, and upon arrival at destination becomes an expense bill. The second copy is the station file receipt, and the third copy is retained by the forwarding agent as his record.



HANDLING FREIGHT—TYPICAL JOINT FREIGHT TERMINAL AND SUBSTATION AT BESSEMER

HANDLING FREIGHT—FRONT VIEW OF RECEIVING SHEDS AT THE BIRMINGHAM CENTRAL STATION

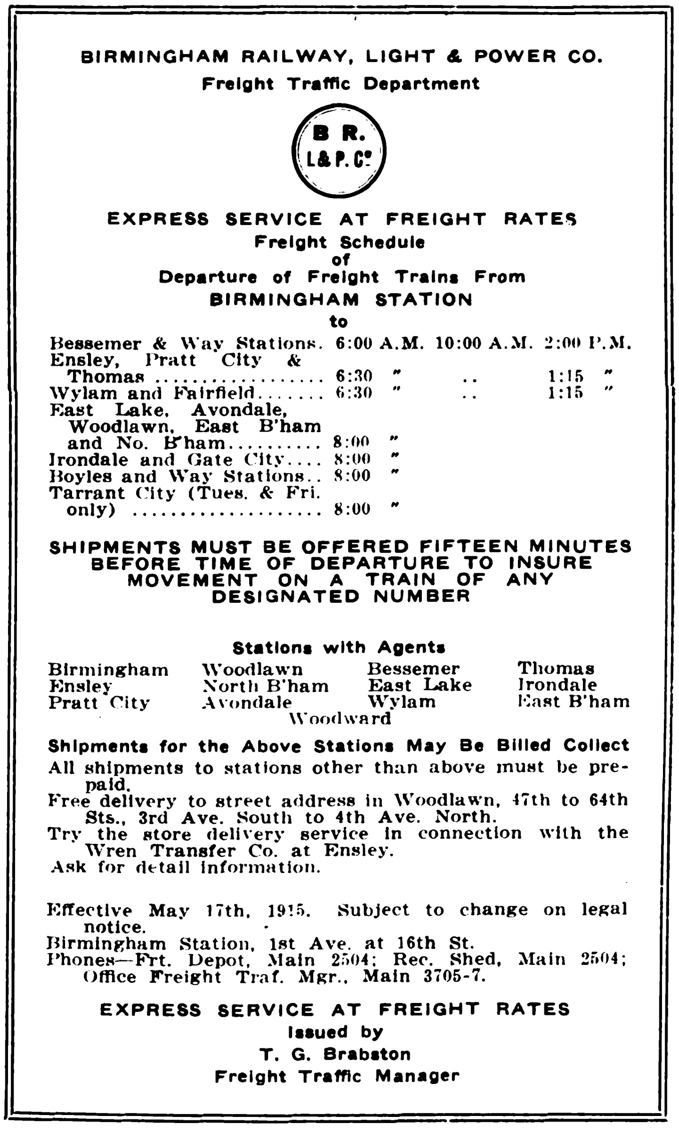
Upon the arrival of a train, the receiving agent has only to list the bills on a "freight received' form, and he is ready to turn them out to the consignees before the car is even unloaded. This obviates the old method of expensing freight from blanket way-bills, as is the practice on steam lines and a great many electric lines. It can be readily seen that through the use of this method quick service is assured.

Service Attracts Traffic

The central station at Birmingham is opened at 5 a. m., and remains open continuously until 5 p. m. The early hour of opening is to accommodate the movement of fresh meat, produce and bread shipments to suburban points, since the suburban merchants are dependent on the distributers at Birmingham for their supplies, and the tonnage of these early trains is made up almost entirely of this class of commodity. Owing to the frequency and reliability of the service, the merchants do not carry extensive stocks, as it is so easy to replenish them daily via electric line service. The existing freight schedule is shown elsewhere. The methods in effect aim at the highest degree of efficiency with the least possible amount of "red tape." With the quick service offered no superfluous practices can be tolerated.

The l.c.l. tonnage varies from 100,000 to 200,000 lb. a day, and fully 50 per cent of this is distributed along the line, in many instances in front of patrons' stores and plants. Even with this plan of distribution and with the rapid service, the claims for losses and damages seldom amount to more than $25 or $30 a month, which seems almost incredible.

The heaviest tonnage is outbound from Birmingham, although with the numerous foundries and factories in the outlying districts there is considerable inbound and interline movement. Cotton in season and truck farm products move freely. Truck farms along the line provide a lucrative source of tonnage, and at present there are 1500 acres of cucumbers planted, which will move over the company's lines to a pickle factory. The company is encouraging the production of such traffic sources as this.



BIRMINGHAM RAILWAY, LIGHT & POWER CO.

Freight Traffic Department

B R.
L&P. Cº

EXPRESS SERVICE AT FREIGHT RATES

Freight Schedule
of
Departure of Freight Trains From
BIRMINGHAM STATION
to

Bessemer & Way Stations.	6:00 A.M.	10:00 A.M.	2:00 P.M.
Ensley, Pratt City & Thomas	6:30 "	..	1:15 "
Wylam and Fairfield	6:30 "	..	1:15 "
East Lake, Avondale, Woodlawn, East B'ham and No. B'ham	8:00 "		
Irondale and Gate City	8:00 "		
Boyles and Way Stations	8:00 "		
Tarrant City (Tues. & Fri. only)	8:00 "		

SHIPMENTS MUST BE OFFERED FIFTEEN MINUTES BEFORE TIME OF DEPARTURE TO INSURE MOVEMENT ON A TRAIN OF ANY DESIGNATED NUMBER

Stations with Agents

Birmingham	Woodlawn	Bessemer	Thomas
Ensley	North B'ham	East Lake	Irondale
Pratt City	Avondale	Wylam	East B'ham
	Woodward		

Shipments for the Above Stations May Be Billed Collect

All shipments to stations other than above must be prepaid.
Free delivery to street address in Woodlawn, 47th to 64th Sts., 3rd Ave. South to 4th Ave. North.
Try the store delivery service in connection with the Wren Transfer Co. at Ensley.
Ask for detail information.

Effective May 17th, 1915. Subject to change on legal notice.
Birmingham Station, 1st Ave. at 16th St.
Phones—Frt. Depot, Main 2504; Rec. Shed, Main 2504; Office Freight Traf. Mgr., Main 3705-7.

EXPRESS SERVICE AT FREIGHT RATES
Issued by
T. G. Brabston
Freight Traffic Manager

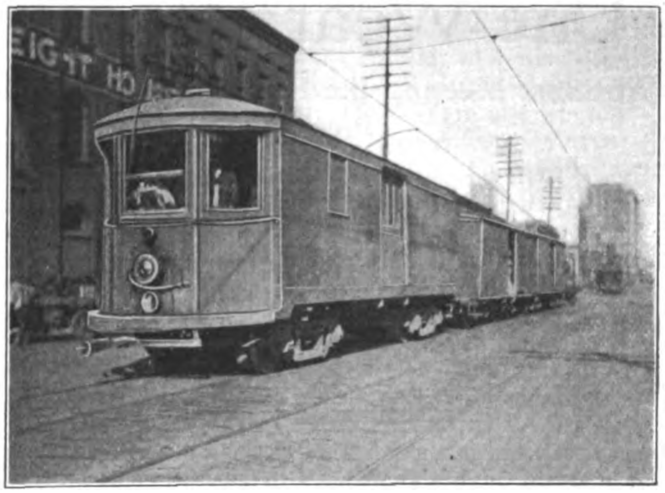
HANDLING FREIGHT—SCHEDULE POSTER ISSUED BY FREIGHT TRAFFIC DEPARTMENT

SPECIAL SERVICES WHICH BRING GOOD RETURNS

In addition to l.c.l. business, physical connections are maintained with the steam line carriers, and local switching service is performed between these connections and the numerous industrial plants, coal yards and team tracks situated along the different lines. One motor car of 300 hp. capacity, equipped with standard M.C.B. couplers and automatic air, is engaged almost exclusively in handling foreign equipment. The number of cars handled a month averages approximately 150 to 200, and earnings vary from $2 to $10 a car, according to the distance traversed.

An extensive business has been built up in the handling of chert, slag and crushed limestone. Track connections are maintained at the sources of supply, and an arrangement is in existence whereby these commodities may be discharged along the main line at points closely adjacent to the work in progress. A crew is maintained for unloading these cars on a per car basis, and a nominal charge covering the actual cost for this work is assessed against the contractor. From 200 to 300 cars of this commodity are handled each month. All of the concrete material for a $500,000 viaduct recently completed over a network of railways was handled by the freight department of this company, although in close competition with steam lines.

An arrangement is in effect with a baggage transportation company enabling patrons at various points along the electric line to check their baggage from their closest station to railway passenger depots and *vice versa*. The conductors are also supplied with baggage checks, and pick up trunks at way stations. The charge for this service is 50 cents per piece of baggage, and settlements are made monthly between the electric line and the transfer company, based on baggage checks lifted. This has proved a great convenience, and a remunerative one.



HANDLING FREIGHT—TYPICAL FREIGHT TRAIN ON A BIRMINGHAM STREET

STATISTICS OF OPERATION

At the present time twelve freight agency stations are maintained. The company operates a total of 150 miles of main track and sidings. Probably 50 per cent of this is crosstown lines, on which no freight trains are operated. The freight equipment consists of four motor cars, nineteen box cars, four flat cars, and seventeen gondola cars. The floor space occupied in depots exclusive of the Birmingham station amounts to 8400 sq. ft.

Accurate figures for 1916 are not available at the time of this writing, but figures hereafter quoted are approximately correct:

Gross passenger revenue for 1916	$1,925,458
Gross freight revenue	57,126
Gross freight revenue per mile of track	380
Gross passenger revenue per mile of track	12,836
Gross freight revenue per car-mile	0.40
Gross passenger revenue per car-mile	0.23
Average car mileage per day for freight equipment	482
Average car mileage per day for passenger equipment	24,030

In connection with the growth of freight revenue, it may be said that the high-water mark was reached in 1910, when the earnings amounted to $120,000. About this time, however, the advent of the motor trucks occurred. As the result of an aggressive campaign on the part of motor-truck companies, the wholesale distributers, being actuated by keen competition, acquired trucks and began to broaden their delivery limits to such distances that the volume of business moving over the electric line was seriously cut. Gross earnings rapidly diminished until 1915, about which time the motor truck craze began to wane, in so far as abnormally long deliveries were concerned. This change, together with energetic measures on the part of the electric line, served to put the gross earnings on the upward trend again.

RATES NOT COMMENSURATE WITH SERVICE

The unfortunate feature in connection with the freight service on this property is that the rates are nowhere nearly commensurate with the service afforded. When the development of the district was in its infancy, the steam lines established a maximum rate of 10 cents per 100 lb. on l.c.l. shipments, and a minimum of 4 cents per 100 lb. for the purpose of attracting industries. As the electric line is in competition with the steam lines at various points, its general standard of rates must be kept on a par with those of the steam lines. Only in a few instances is the electric line rate higher than that of its competitors. The result is that, although the electric line carries the bulk of the district traffic, it is forced to handle an enormous tonnage to produce an appreciable revenue.

A review of the freight situation on the Birmingham property points conclusively to the fact that frequent schedules, operation with unvarying regularity, and efficient methods of handling with liberal put-off privileges will not only hold but attract traffic. Moreover, the freight department is unquestionably a valuable feeder to the passenger service, since it encourages the building of residences away from the congested city through the supplying of stocks for suburban mercantile centers. This is a feature which is frequently overlooked by operators of interurban properties and one which, because of its importance, is deserving of considerable study.

One-Wear Wheels and Track Building

At Short Meeting the Illinois Association Discusses These Subjects, Pledges Support to President Wilson and Views Electrification Pictures

A SHORT meeting of the Illinois Electric Railway Association, held at the La Salle Hotel, Chicago, on March 23, was presided over by President C. F. Handshy, assistant general manager Illinois Traction System. At the morning session a paper on the "One-Wear Manganese Rim Wheel," by F. A. Lorenz, was read by the author, and another by W. F. Carr on "Track Construction and Maintenance" was read by L. E. Gould, in the author's absence. Abstracts of these papers appear elsewhere in this issue. Mr. Carr was detained from attendance at the meeting on account of a death in his family. During the course of the meeting the association extended to him a vote of sympathy.

Directly after luncheon, A. B. Cole, Westinghouse department of publicity, talked on the progress of electrification work, and showed several reels of Westinghouse electrification pictures. These portrayed electrifications on the Norfolk & Western, the Boston & Maine (Hoosac Tunnel), the Grand Trunk (St. Clair Tunnel), the Pennsylvania (Philadelphia-Paoli division and New York extension), the Long Island, the New York, Westchester & Boston, and the New York, New Haven & Hartford.

ONE-WEAR MANGANESE RIM WHEEL

In connection with his paper on the one-wear manganese-rim wheel, F. A. Lorenz, manager of sales, Davis wheels, American Steel Foundries, presented a series of slides with which he illustrated the method of making the Davis steel wheel, which he said was now in use on more than 350 electric and steam railroads. An article describing the manufacture of the wheel was printed in the issue of the ELECTRIC RAILWAY JOURNAL for July 8, 1916, page 69. A special advantage of this wheel in electric railway service, according to the speaker, is that it resists flat sliding very successfully. In fact, the company has never received a report of flat sliding under a self-propelled car operated in single unit. To determine this matter more definitely the company not long ago conducted a test on an electric railway in which a 60,000-lb. interurban car equipped with Davis wheels was slid over a stretch of prepared track from a speed of approximately 25 m.p.h. The stretch consisted of 50 ft. of oiled track, 20 ft. of oiled and sanded track, and 30 ft. of dry sanded track. In both sections the sand was heaped on the rails, and when the car slid over the track the front trucks slid 22 ft. beyond on the dry rails. Immediately after this test the wheels were examined, and bright spots no larger than a dime were seen to have been produced on the tread of the wheels. These really consisted of nothing more than slight ticks on the tread of the wheel. The car was then run up and down on the track to determine whether or not the spots would affect smoothness of operation, but the five people on the car could hear no noise produced by them. When the car reached the carhouse the wheels were again examined, but it would have been impossible to locate the spots, except that their location had been carefully marked on the rim of the wheel.

Mr. Lorenz explained also that the wheel is approximately 20 to 25 per cent lighter than the wrought-steel wheel or the cast-iron wheel for the same class of service, which is an important point, since an appreciable part of the power consumed in accelerating a car is absorbed by the wheels. This lightness is secured because excess metal is not needed in the rim for wear and turning, and also because the steel has a very high tensile strength, approximately three to four times as great as chilled cast iron. At the rate of 5 cents per pound per year to haul dead weight, a saving from 400 lb. to 1600 lb. per car in wheel weight amounts to a large sum. Moreover, with a one-wear wheel, the diameter remains practically constant, which insures even motor load. In brief, the speaker claimed that the Davis wheel, with a hard, tough manganese steel tread and flange combined with a soft ductile steel plate and hub, is the ideal wheel for electric railway service. Broken flanges, chipped rims, and other common wheel troubles are practically eliminated.

DISCUSSION ON MANGANESE-RIM WHEELS

In reply to questions from several of the members, Mr. Lorenz brought out several additional points regarding the cast-steel wheels. He said the Pacific Electric Railway at Los Angeles was using standard M. C. B. Davis wheels with a 1-in. high flange and 3⅝-in. tread, and was operating these over special work having a ⅝-in. deep groove, in an attempt to reduce the noise of cars crossing special work, so that the entire car weight was carried on the flanges. Under these severe conditions the wheels had made a very satisfactory showing on the Los Angeles property, and no chipped flanges had resulted.

As to mileage obtainable with these wheels, Mr. Lorenz said there were so many factors entering into this that he had not as yet been able to secure many data. With the conditions prevailing on one property, or on one line of a property, a comparatively low mileage might indicate extremely good life as compared with other types of wheels, while with conditions prevailing on other properties or other lines, a mileage of several times this amount might not be a good life for the wheels. Thus a statement of mileage figures did not carry much meaning, unless all of the operating conditions were clearly understood. He said that on a very heavy traffic interurban line, on a car equipped with the 30-in. standard wheels weighing 30,000 lb., and operating at a speed of 45 m.p.h., the Davis wheels had shown a life of 100,000 to 200,000 miles.

President Handshy spoke of a very satisfactory experience with this type of wheels, and said that there was a notable absence of chipped flanges and slid flats.

As to cost comparisons, Mr. Lorenz stated that his company had been called upon within the last twelve months to make at least 150 different designs of wheels for electric railways, and that this, of course, had been a factor in the cost. The price of the one-wear manganese-rim wheel, he said, was approximately the same as that of the multiple-wear wrought-steel wheel. This, however, did not tell the story, as the increased mileage and the elimination of a large item of labor which was saved through the fact that the wheels did not need to be taken off and turned and pressed on again, produced a less cost per 1000 miles than other types of wheels.

Mr. Lorenz had as yet been unable to get authoritative mileage costs, as he said so few companies keep any accurate record of their wheel costs. Since it is unnecessary to remove the wheel from the axle, except when entirely worn out, it is usually unnecessary to change the bearing brasses, as is frequently the case when replacing a turned wheel. It had also been found that the life of a solid wheel and a solid gear was approximately the same. This introduced a saving and made for better gear efficiency, since there was no altering of the meshing of the gear with the pinion, as might be the case where the wheels were changed more frequently. The labor saving, he said, is the great advantage which the manganese-rim wheels carry.

J. B. Tinnon, Joliet, said that the special-work manufacturers had found trouble from the crystallization of manganese-steel special work, and wondered how it was possible, with the great vibration to which car wheels are subjected, to prevent a similar trouble in the wheels. Mr. Lorenz explained that this was due to the particular characteristics of the manganese steel used for the wheels, which was different from that used in special work. He said that manganese steel, with from 1 to 2½ per cent of manganese, has very favorable characteristics, including high tensile strength, high elastic limit, etc., and that the wheels were made of this type of steel. With more than this amount of manganese the steel became brittle and had poor characteristics. Then again at from 9½ to 13 per cent of manganese the steel had about the same characteristics as the 1 per cent and 2 per cent manganese steel. He said the 13 per cent manganese steel was known as the Hatfield product, and was the type used for crossovers, but that this was not suitable for wheels, as it would flow slightly under continued hammering.

OTHER IMPORTANT MATTERS

Dr. H. E. Fisher, Chicago Elevated Railways, made an appeal to the association members to enlist the services of their respective physicians in an endeavor to prevent the general passage by state legislatures of a bill being promoted by the American Association for Labor Legislation, which provides for compulsory health insurance. This Dr. Fisher said, had been tried out in all the principal European countries during the last twenty to twenty-five years, and had proved an absolute failure. It was a measure supported by reformers and insurance companies, which placed a great burden upon the medical profession, since it compelled the physicians to give medical attention to all industrial employees in certain specified areas. Any employee receiving less than $100 a month was included in the benefit, and his employer was required to bear 50 per cent, the employee himself 30 per cent, and the state 20 per cent of the cost of any medical attention, including prescriptions and hospital bills. This also applied to such an employee's family with the same percentages. Such a bill would, of course, affect the electric railways, since many of their employees would be included in the class for which the legislation is intended. It would bring a new burden upon the corporations, but is principally a burden upon the medical profession. A bill is now before the Massachusetts Legislature which, if passed, will probably be tried out in that State for a short period before it is introduced in other state legislatures.

H. B. Adams, Aurora, then introduced a resolution to send the following telegram to President Wilson, which was unanimously approved:

"The Illinois Electric Railways Association, representing the electric railway network of the State of Illinois, by unanimous vote, at its meeting in Chicago on March 23, begs to extend to you and to the government of the United States, its loyal support in the eventualities of a declaration of war, and to offer the utmost services of these railroads whenever they may be useful."

Proposed Additions to University of Illinois Engineering Facilities

The College of Engineering and the Engineering Experiment Station of the University of Illinois have prepared for the Governor and the General Assembly of the State a synopsis of the achievements and needs of these institutions. The brief is illustrated with pictures of the work of prominent graduates. The college and station have cost for the two years ending July 1, 1917, about $761,000 for operating expenses. It is proposed to double this expenditure for the next biennium. A program of buildings, estimated to cost somewhat under $5,000,000, is also outlined. This, together with the grounds and departmental equipment, involves a cost of about $6,000,000. It is hoped that appropriations can be secured so that this program can be gradually carried out.

Track and Roadway*

The Author Discusses a Number of Points in Connection with the Upkeep of Permanent Way That Have Been Found to Be of Advantage in Reducing Maintenance Costs and in Improving the Line and Surface of Track

By W. F. CARR
Engineer Maintenance of Way, Chicago, Ottawa & Peoria Railway

TO get results in track maintenance I believe in well-directed red tape and in printed forms. On our railroad we have more than twenty printed forms for the maintenance department, because we have found that a foreman will fill out an arranged set of questions with greater ease and dispatch than if the subject is left to his own treatment. We have found further, that he is careful not to exaggerate a signed written statement. When these reports reach the maintenance office they are filed away on wall boards, each wall board containing a certain form. If we need to refer to any particular performance, we can turn to the report without loss of time.

We believe also in schedules. Our linemen have a schedule for the patrol of the line, and our track men have a schedule for the performance of their work. These schedules are made broad enough to allow the man to take care of any emergency conditions that may arise, and after he has cared for that condition, he goes back and resumes his work according to his schedule. Our foremen have certain days for the tending of switch lamps.

The first thing that is done by our track foremen at the break of spring is to devote one or two weeks to the picking up of low spots or churning joints. As soon as the low spots have been picked up, we begin to renew the cross ties and to surface and line the track. The entire season's work is carried along in this manner.

In establishing a schedule we take conditions into consideration and to some extent we work out an individual performance. For instance, where the ties are not too greatly scattered, one man should renew ten ties in ten hours. This will include spiking, tamping, lining, filling in, dressing up and leaving everything complete. Where the ties are renewed as the surfacing is carried on, one man should average 30 ft. or 35 ft. of track, including the renewal of two or three ties to the rail. This will include the raising, lining and spiking of the new ties, or in other words, the work finished up complete. It might be worth while to state that this schedule stirs up considerable competition among the different foremen and they take pride in beating it if they can. Such schedules may be made by a brief study of the conditions and average performances. Men must be instructed and must have a pace laid out for them. This is just as necessary for the track men as for the trainmen.

Labor-saving tools for the maintenance department are not only economy but, with the scarcity of labor, an absolute necessity. Steam shovels or ditching machines to handle excavations or cleaning of cuts, automatic dump cars, portable cranes for the handling of materials, pneumatic tampers, power drills, arc welders, and such devices are money savers and necessities if the work is to be done well and in its season. A higher wage can well be paid to the operator of a labor-saving device. Most executives of this day would not allow their property to be without a concrete mixer. It has already proved its value, just as the more recent labor-saving devices are proving their value in reducing costs.

ROADBED

Every single-track roadbed should be not less than 18 ft. wide and should be kept at that width. When the shoulder slips down, clean out the cuts and build it up. Enough shoulder must be maintained to withstand the lateral pressure thrown out by the weight of a moving mass over the track.

Avoid a barrow pit as a pestilence. Any sort of berm that may be left soon slips down into the pit. The toe of the slope is almost always wet and this accelerates the slipping of the shoulder of the roadbed. Even the right-of-way fences fall into a barrow pit after a while. It is a source of complaint from your neighbor, the farmer. He contends that it keeps a stretch of wet land in his fields, and he can almost always prove it before a jury of his kind. There are very few barrow pits that are not trouble makers, and in the end it is real economy to pay overhaul on the embankment material in the beginning.

If there is a wet cut on a railroad, tile it out and be done with it. Sometimes tiling can be circumvented by ditching, but if the cut is not very wide more money can be spent on a ditch in five years than what a 10-in. tile laid through the cut will cost. Fill over the top of the tile with cinders or some other porous material that will allow drainage to get into the tile. At this time of the year, with the breaking up of winter, the drainage truth is manifesting itself. Now is the time to find out where ditching is needed.

At the last convention of the American Electric Railway Engineering Association, 12 in. of gravel under the ties for main-line track was recommended. Personally, I think this is more than most electric railways can afford. It is our standard practice to put 8 in. of ballast under the ties, whether of cinders or bank-run gravel. A 12-in. lift necessitates going over the track with a surfacing gang two or three times in a season in order to compact the ballast. In resurfacing use only as much ballast as is necessary and pack it firmly by means of a tamping bar. Too great a depth of ballast acts like a feather bed; the superstructure sinks into the uncompacted ballast.

In still another respect we do not agree with the members of the way committee, who recommend washed gravel ballast ranging in size from ¼ in. to 2 in. We insist that all washed gravel be one-fourth sand. Washed gravel cannot be compacted unless there is sand with it. The gravel rolls over the roadbed; it has a tendency to go anywhere but to the place where it is wanted.

Ties, according to our experience, cannot be too carefully inspected. Untreated red oak, black oak, beech, elm or gum ties had better be left out of the track than put in. They will decay inside of three or four years, and, in the case of elm or gum, will check so badly in a short while that they are unfit for use. An undersized tie should not be bought. It is not capable of performing its proper duties as a bearing surface. Pole ties or ties cut from young white oak should have a width of face not less than 6 in.; otherwise the sapwood portion of the tie will rot off in a couple of years and the result is a fence post about 4 in. in diameter.

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*Abstract of paper presented before Illinois Electric Railway Association, March 23, 1917.

Another point that should be watched very carefully is that treated ties are cut from live, sound wood. I have seen well-treated ties which were so brashy that, when they were thrown from the car to the ground in unloading, they broke like sticks of punk. Just as good ties are needed for sidings as for main track, because a siding usually cannot and does not receive the same amount of attention that main tracks do, and when a siding is tied up it should be tied up with good, sound timber.

It is well to bear in mind that the life of a tie is always determined by the length of time that it will hold a spike. This life may be prolonged by pulling the spike when it begins to work up, driving in a tie plug and redriving the spike. It is worth while to do this in a great many cases, and in every case where a railroad is well maintained, as it will prolong the life of ties for a year or two. Economy in maintenance forbids the removal of a tie that will give service for six months, except at public or private road crossings. This rule can be adhered to in ordinary maintenance without any risk, because the average track foreman is too much inclined to make a clean sweep of tie renewals, and a check like this should be placed upon him.

RAIL AND RAIL JOINTS AND BONDS

At the present price of steel a rail costs from $13 to $25, and it is worth your attention. It should not be thrown from a car or unloaded while a car is in motion, except when an approved unloading device is used. It is economy to buy standard steel shims and have two men on the gang to see that the shims are properly placed, and, when the rail is fastened, remove the shims and take care of them. The standard steel shims will be paid for after the first winter's contraction of the steel through savings in broken bolts in improperly spaced joints. At the foot of a heavy grade or incline the expansion should be more than at the top of the grade, as the tendency of rail is always to creep downhill.

In renewing steel, the track should be placed in good line and surface before the rail renewals are made. Once a rail is surface bent, it has been started toward ruin.

All rail should be saw cut. I have seen printed instructions for chisel cutting rails, and I always feel like destroying the print. When your man marks his rail with a chisel, and then raises it and drops it, you are just as likely to find that it will break out a part of the web and flange as to break off square along the marked line. He will try to cover up the damage, and you will find the rail, in a year or so, butted up against a $300 piece of special work, which has been ruined. It may take two hours to saw the rail, but that is cheap compared with the cost of the rail. Even the cost of the rail is cheap compared with the cost of ruined special work.

The shame of track is loose joints. A loose joint is ruinous, first to the rail, second to the tie, and third, but far from being the least, to the rolling stock. Three things combine to make a loose joint: First, an improper application of the joint; second, an improper bolt; and third, the lack of muscle on the wrench. Rust or scale should be cleaned and knocked off before the joint is applied. Threads on bolts should be cut and not pressed, so that the threads in the nut will fit. The nut should be tightened by a long-handled wrench, power being applied to the wrench by a steady pull and not by a series of jerks. An improperly tightened joint soon ruins the bonds. It surface-bends the rail or gives a lippy joint that ruins one of the adjoining rails by the shear of wheel flanges.

A defective bond not only destroys the negative return circuit, but if it is not repaired it will burn out the rail in from six months to two years, dependent upon the flow of the negative current. A bond under maximum cost conditions is worth an insignificant amount compared to the cost of the rail, yet tons of rail are thus being burned up annually.

Bad bonds occur in alternating patches. When a car lurches over a loose or low joint it reacts on the next joint or two, and soon you have several bad joints and several bad bonds where you had only one to start with. A bad bond is seldom found on a well-kept joint. Not infrequently we find railroads that have the bonding of track in the overhead or electrical department. It should be under the maintenance department, because when a bond is applied the joint should be tightened. No bonds should be applied to low joints. The track gang should precede the bonding gang, surfacing low joints and tightening them. The bonding gang should be supplied with bolts and long-handled wrenches, and behind the bonder should come one or two men to tighten bolts.

Every day that an armature is dragged over poorly bonded track its coils are being heated. Some day the armature will burn up, or you will snap a crystallized rail in two, or break an axle. The bad bonding has been showing up in your power bill right along, but you have been blind to it. Please consider that a set of armature coils or a steel rail is worth more than a bond, and please consider further that you are paying for the bond in your power bill. A bad bond may be hard to find, but it is like the overcoat on the expense account—it is there just the same.

In concluding this subject it seems fit to say that if we would search more deeply for waste, and be prepared to show our executives the waste of allowing bad conditions to remain, we could get any necessary money. The modern engineer is not an inspector. If he is, he is not fulfilling his job. He must be able to present orderly and logical reasons for every betterment that he suggests, and he should work out not only the cost of doing a piece of work but the cost to the company of not doing it. He should present facts so clearly for each proposed improvement that there will be no putting him off.

Analysis of Chicago Automobile Traffic

Under the direction of M. J. Faherty, president Board of Local Improvements, Chicago, a census of the automobile traffic in the Chicago downtown district was taken during six days last June and has just been made public. During the six days 43,761 automobiles entered and left the downtown district, but as many entered and left several times, the extent of the downtown traffic is measured better by the number of movements, which were 299,762 in and out of the loop. A record was also kept of the machines which stopped in the downtown district to permit the driver to do business. Those which passed through were counted as "pleasure cars." On this basis 87 per cent of the cars was shown to be used for business purposes. Adding those of the others known to be used by their owners in their regular occupations, Mr. Faherty concludes that 95 per cent of all machines owned in Chicago are used for business as well as recreation.

Making a Traffic Survey for Workers

Chicago Traction and Subway Commission Presents an Analysis of the Residential Distribution of Employees of Industrial and Commercial Establishments as an Aid in Determining New Routes

As part of the work leading up to its final report, the Chicago (Ill.) Traction and Subway Commission made a study to determine the places of residence and routes of travel of a large proportion of the workers in factories and in the offices and stores in the loop district, in order that it might ascertain whether the present facilities were adequate and whether the existing routes of travel to and from work were direct or round-about. This study forms the subject matter of Chapter VII of the supplemental report of the commission, the main report having been abstracted in the ELECTRIC RAILWAY JOURNAL of Dec. 9 and Dec. 23, 1916.

Various industries of the city were visited by representatives of the commission, who were given access to the address lists of the employees. From these, tabulations were made on special forms recording for each employee the place of occupation and the quarter-mile section of the city in which he lived. When all of the larger factories in any locality had been summarized, they were combined into a group, and the total group figures were then platted on maps to show graphically the number of workers living in each quarter mile for the particular factory group location.

TABULATING THE SURVEY RESULTS

Information was obtained in this manner from 591 industrial and commercial establishments having a total of 350,007 employees and averaging 592 per industry. The individual industries varied from less than 100 employees to 12,790 for the largest concern checked. After tabulating the data for each factory group location and summing up all groups, it was found that 24 per cent of the workers lived within 1 mile of their places of employment and were assumed to be walkers; 18.6 per cent lived between 1 and 2 miles away; 12.7 per cent lived between 2 and 3 miles away, and 12.7 per cent, 3 and 4 miles. The total of 44 per cent living between 1 and 4 miles was classed as surface car riders, and these with the walkers totaled 68 per cent. The remaining persons, about 32 per cent, lived more than 4 miles from their places of employment and were classed as rapid-transit riders. The percentage of employees living in these zones decreased steadily with the distance of the zone from the location of work until the suburban class was reached, when an increase was shown. This increase was largely caused by the great area tapped and the rapid commutation service supplied by the various steam railroads. The average distance traveled by all riders in the groups was 4.23 miles.

PORTION OF RUSH-HOUR RIDERS DETERMINED

From the surface lines and elevated traffic checks it was determined that there are approximately 1,262,500 rush-hour riders in the two rush periods of the day—that is, from 6 a. m. to 9 a. m. and from 4 p. m. to 7 p. m. The industrial population check covered 350,007 persons, who, traveling twice each day, make a total of 700,014 trips. Of these 700,014, 24 per cent were found to be walkers, leaving a total of 525,000 passengers checked who ride in the rush hours. These then compose practically 42 per cent of the total rush-hour passengers in the city. Inasmuch as the periods counted as rush hours are three hours long in each case, it is probable that some persons, other than workers proper, were included in the railway lines rush-hour periods. Therefore, it was considered entirely proper to adopt a figure of 50 per cent of the total rush-hour travel of the city as being covered by this industrial check, or, in other words, to consider that 50 per cent of all the working population of the city was reached and tabulated by the method above discussed.

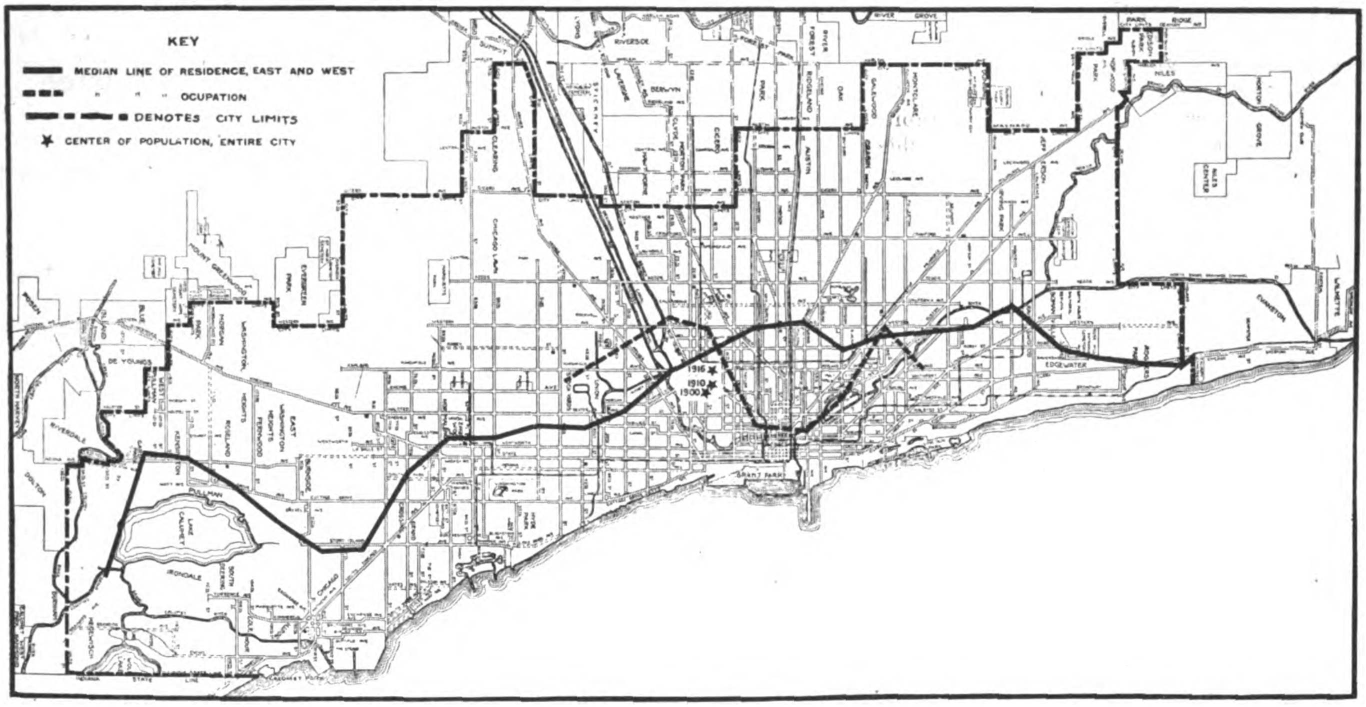
The extent to which the industries of the city are grouped in the central business district is indicated by the fact that 48 per cent of the total of 350,007 persons checked are daily employed in an area of 5 square. miles in this downtown district, extending from Division Street to Twelfth Street and from the Lake to Racine Avenue. An extension of this district to 12 square miles includes only 53 per cent, with the remaining 47 per cent distributed throughout the city. Further extensions of these areas show that each doubling of the area will add about 10 per cent until at 64 square miles 91 per cent of the total workers are included, while of the remaining 9 per cent, 7 per cent are located in the several manufacturing groups of the Calumet District.

A study of the various groups of factories with reference to their proximity to rapid transit lines showed that groups employing 231,000 were at present within reasonable walking distance of the elevated railroads, while by the improvements planned to be made immediately additional groups employing 74,000 workers would be brought directly into rapid transit connection with the principal residence districts of the city. This would enable 305,000 or 87 per cent of the workers checked to live in any of the three main divisions of the city and reach their work by high-speed rapid transit lines. The remaining groups, employing 45,000 workers, would be reached in the later additions and extensions to the system.

TRAVEL OF LOOP DISTRICT EMPLOYEES

In studying the traffic requirements of the employees in the loop district, or the first group, the commission gathered data comprising 136 concerns including banks, office buildings, stores, wholesale houses, factories and miscellaneous establishments. These concerns were listed in four parts, divided approximately on the lines of Clark Street and Madison Street, and each quarter of the loop was studied as a separate group. The studies covered a total of 115,085 employees divided among the four sections as follows: Southeast quarter of the loop, 36,203; southwest quarter, 34,723; northeast quarter, 32,246; northwest quarter, 11,913. Only 3.7 per cent of the 115,085 workers checked in the loop walk to their work, and the indications were definite that these came from the section of the city just north of the Chicago River. The percentage for the loop group of workers living at various distances from the loop was found to vary quite distinctly from that for other groups outside the loop, in that the former percentage increased steadily to the 4 to 5-mile distance before it began to decrease. In practically all the other groups the percentage decreased with increasing distance from the point of occupation to residence. This fact shows the loop workers to be long-distance riders, indicating the necessity for high-speed rapid-transit service for their accommodation.

An analysis of the method of transportation of loop district workers showed that of the 115,085 employees checked, 64,847 were elevated riders, 43,344 were surface car riders, 3921 were steam-road riders and 2973 were walkers. By the above segregation of the loop workers into four sections, it was also found that of the 34,723 workers in the southwest quarter of the loop, 8150 lived on the South Side of the city and consequently had no direct service to their work in the morning, while 7876 living on the North Side had no direct service from their work to their homes in the evening. Each of these groups must cross the loop, one in the morning and the other in the afternoon, thus adding to the pedestrian congestion. Similarly, of 32,246 in the northeast quarter of the loop, 8621 from the North and Northwest sides of the city and 10,656 from the South Side were inadequately served, since they must walk back and forth across the loop in the morning and afternoon. Of 11,915 workers in the northwest quarter of the loop, 4025 from the West Side were insufficiently served in the morning. The report points out that the importance of convenient transit facilities for the loop workers cannot be overemphasized, for it comprises practically one-third of the total workers canvassed. Moreover, any improvements which care for these riders also provide for the convenience of many thousands of shoppers and pleasure seekers who travel to and from this district throughout the day and well into the night.



MEDIAN LINES OF RESIDENCE AND OCCUPATION FOR CHICAGO IN 1916

TRAVEL FOR OTHER GROUPS

This same method of analysis was carried out by the commission in connection with the three other groups in the central business district and with other groups outside. For the combined groups in the central business district it was found that 9.3 per cent of the workers lived within walking distance (1 mile); 42.1 per cent within surface car radius (4 miles) and 48.6 per cent at rapid transit distance (more than 4 miles). The four groups comprise 169,975 workers or 48 per cent of all checked. In this district, bounded by Division Street, Racine Avenue, and Twelfth Street, are found most of the badly congested traffic points in the city, and the correction of its local difficulties will so far solve the general transportation problem that the remainder of the city can be treated in detail. Bordering on the edges of this district are most of the over-populated localities, with their serious housing problems. Better and more diversified transportation, the commission states, will tend to distribute the population and relieve these conditions.

In comparison with the loop and central business district, comprising the four groups mentioned above, many of the older established factory groups show very heavy percentages of walkers, while the newer established plants, those of the Western Electric, Sears, Roebuck and Crane companies have the same general percentages of walkers, surface car riders and rapid transit riders, but the number living at great distances is not so marked as in the case of this central district. In the opinion of the commission, it is to be expected under normal conditions that when the newer plants shall have been for a longer time in their present localities, the traffic characteristic of their workers will gradually change so that more of them will reside within walking distance, as is the case with the older established groups, such as the International Harvester Company and the Stock Yards industries. Already there are indications of this change in the building of residences about the newer plants. The fact remains, however, that more than 30 per cent of all these workers live at rapid transit distances from their places of employment, and for them rapid transit connections should be provided.

INFLUENCES DETERMINING RESIDENCE

The commission states that there seemed to be three factors entering into the determination of the residential locality of factory groups, as follows: (1) The age of the factory, the general rule being that the older factories have large groups of their employees concentrated in their immediate neighborhood with comparatively small numbers coming from any considerable distance. (2) Similarity of occupation, *i.e.*, where groups widely separated employ the same classes of labor, the employees of all of the groups will be found living in the same neighborhood. (3) Convenience of transportation, which probably covers both of the others. Its discussion in this connection is aimed to bring out the fact that it is impossible to consider any grouping of workers by occupation. There must be convenient transportation in all directions connecting all factory groups with all residential areas in the city, or those residential areas which are not so connected will not be fully or quickly settled.

PROVING THE NEW RAPID TRANSIT ROUTES

From these studies it was possible for the commission to determine not only the degree of service which was being rendered by the present transportation systems, but to gain a very definite idea as to where the principal travel would be, provided it progressed in the most direct route. The information brought out by the various group studies aided materially in laying out the proposed new transportation routes. By grouping the quarter-mile residence districts to indicate the number of workers living within a distance of ½ mile on either side of a given street, whose daily occupation would take them to districts served by the rapid transit line proposed along this street, it was possible to determine the relative advantages between two streets as a proposed route for a rapid-transit line.

Such an analysis of the proposed Ashland Avenue north and south rapid-transit line showed that 80,000 workers living along the line and traveling to factory districts were included in the commission's industrial investigation. On the other hand, along Halsted Street, which parallels Ashland Avenue about a mile farther east, it was found that the half-mile district on either side contained only 56,000 workers whose daily occupation would take them to the districts canvassed in this investigation.

In classifying the workers along these two streets by the mode of transportation they would require, according to the distance away from their work, it was found that of the 80,000 workers checked along Ashland Avenue, there would be a total of 33,600 walkers and surface riders and 46,400 possible rapid-transit riders; while of the 56,000 workers living along Halsted Street, there would be 28,600 walkers and surface car riders and only 27,400 possible rapid-transit riders. This indicated that 19,000 more workers would be benefited by a rapid-transit route along Ashland Avenue than by a similar route on Halsted Street.

Following this method of reasoning and using the industrial population checks for the different groups along the rapid-transit lines as a basis, the commission was able to develop a load curve for the proposed Ashland Avenue line during the rush-hour period and during the entire day. In this manner it was found that for a single rush-hour period the north-bound Ashland Avenue line would carry a load of more than 9000 passengers from the workers checked, which may be rated up to 15,000 in accordance with the ratios of those checked to other passengers who were not reached in the industrial check. Similarly, the total south-bound traffic was estimated at 10,000 passengers during the rush period. By using the ratios found on the present transit lines as between rush-hour and all-day loads, it was assumed that the total daily load of the Ashland Avenue line would be 80,000 passengers within a reasonably short period after its opening for traffic.

MEDIAN LINES OF RESIDENCE AND OCCUPATION

Another of the studies used by the commissioners in arriving at the best location for rapid transit routes was the establishment of a median line of residence and another of occupation across the length of Chicago. It was found that the median line of residence followed the general trend of the lake shore at a distance of from 2 to 3 miles west, while the median line of occupation showed a distinct contrast to the population line. The concentration of a large number of workers in the loop district pulls this line far to the east through the north and south central portion of the city. With these two lines established, the report states that it is obvious that a transportation line cutting across these two median lines of residence and occupation the most often will develop the greatest number of passenger rides, provided the lateral distribution is ample at all points. In this respect, it was shown that Ashland Avenue was peculiarly well situated, since it cuts across the median line of residence twice and the median line of occupation four times in its length. Ashland Avenue is also well situated with respect to lateral distribution, inasmuch as it directly intersects six lines of present rapid transit from the west.

A. R. E. A. Action on Committee Reports

An Abstract Is Given of the Proceedings of the 1917 Convention as Far as They Relate to Electric Railway Practice

PRESIDENT A. STUART BALDWIN, chief engineer Illinois Central Railroad, presided over the sessions of the American Railway Engineering Association's convention in Chicago, March 20 to 23. In his address, he reviewed the work of the association during the year and commented on steam railroad electrification work. In this connection he said that a few years ago the demand on the part of the public for electrification of steam railways was more insistent than it is at present.

"It is becoming recognized that the cases in which steam railroads are justified financially in electrifying are exceptional; that in the present state of the art it is only where unusual conditions prevail that the change from steam to electric traction is justified, such as, for instance, the necessity for the elimination of smoke from tunnel operation; the requirements for the expansion of business in congested districts, exceptional possibility of economical power production, whether by fuel or water, or an unusual combination of excessively heavy traffic with high gradients. It has been further proved that the proportionate responsibility of railroads in large cities for the smoke nuisance has been greatly exaggerated."

During the three-day session of the Engineering Association, the hearing of standing committee reports occupied practically the whole time. A very large part of the material submitted in the committee reports was received by the association as "progress reports" or as "information" for publication in the proceedings. The committee on wooden bridges and trestles reached several general conclusions which were summarized in the issue of this paper for March 24. These conclusions were approved by the association with one exception, which was a statement that "creosoted timber trestles are more economical than concrete, except when the cost of the concrete structure is less than one and one-half times the cost of the wooden structure." This conclusion involved certain assumptions on the part of the committee which were not thoroughly explained in the report, and the experience cited by a number of the members threw a reasonable doubt over the conclusions, and the association voted to refer this back to the committee for further consideration. An abstract of the discussion appears in the department on "Equipment and Its Maintenance" elsewhere in this issue.

The report of the committee on conservation of natural resources was adopted with the exception of that part referring to electrification of railways, which was held over and ordered not printed in the proceedings, pending investigation. This report, looking to the prevention of accidents and consequent damage claims and the conservation of human life, included a recommendation that laws be enacted making trespassing upon railroad track a misdemeanor.

The design and specifications for a standard cut track spike and a standard screw spike, recommended by the committee on track, were adopted by the association with one or two minor modifications. The discussion in this connection brought out the fact that it had been impossible to get some of the manufacturers to make spikes in accordance with these specifications, since it was impossible for them to make the spike with existing automatic machines. However, the committee reported that it had been assured that automatic machines could be made which would turn out this design of cut spike as rapidly and as cheaply as the designs at present in use. The balance of this committee's report was received as information.

The following conclusion of the committee on ballast was adopted by the association: "It is generally conceded that stone ballast is the most effective ballast, and experience has demonstrated that the best quality of each of the various kinds of ballast should fall in about the following order of effectiveness: Stone, washed gravel, broken slag (not granulated), pit run gravel, chatts, burnt clay or gumbo and cinders." The committee's recommendations on the depth of ballast was adopted by the association with an amendment, and reads as follows: "The depth of ballast under the tie, on roadbed material such as clay, loam, etc., subject to deformation by the application of live load, should seem to be not less than the spacing, center to center, of ties."

The recommendations of the committee for a 12-in. sub-ballast blanket of cinders were also adopted. But the recommendation for a standard ballast section for Class A track with a sub-ballast and top-ballast, and a sub-grade width, was voted down, and as the two previous recommendations for ballast and sub-ballast and the standard section are interdependent, they were all referred back to the committee for further study.

Specifications for constructing concrete piles as submitted by the committee on masonry were referred back to the committee, to be reported with drawings next year, as were also specifications for driving concrete piles.

The specifications submitted for surface finishing of concrete were adopted. The same disposition was made of the design for retaining walls and formulas for designs of retaining walls and these will be inserted in the Manual. The association also adopted the specifications and methods of tests for Portland cement which had previously been adopted by the American Society for Testing Materials.

The committee on wood preservation made certain revisions in the association's specifications for creosote oil analyses, including changes in the method for fractioning, and added several new sections to the specifications. These changes and additions were approved by the association and will be published in a supplement to the Manual which will be issued this year.

NEW OFFICERS ELECTED

At the close of the afternoon session, March 21, the election of the following officers for the ensuing year was announced:

President, John G. Sullivan, chief engineer Canadian Pacific lines west, Winnipeg, Man.; first vice-president, C. A. Morse, chief engineer Chicago, Rock Island & Pacific, Chicago; second vice-president, Earl Stimson, engineer maintenance of way Baltimore & Ohio, Baltimore, Md.; treasurer, George H. Bremner, district engineer division of valuation, Interstate Commerce Commission, Chicago; secretary, E. H. Fritch, Chicago.

Illuminated Maps of Railway System

Transparent Paints on Plate Glass Aid British Columbia Company in Publicity Campaign

TWO transparent electric map signs, believed to be the first of their kind on this continent, have been installed at the entrance to the interurban station of the British Columbia Electric Railway Company, Ltd., at Vancouver, B. C. The object sought was the education of the passing public to the actual layout of the company's city and interurban systems, as well as the importance of the company in the surrounding districts.

Each sign is 5 ft. 1 in. x 10 ft. 1 in. x 6 in. deep, framed of 1½ in. x 1½ in. x ¼ in. angles to which are riveted twenty-two-gage galvanized iron back and sides. The signs are wired in three divisions, and so constructed that each may be removed if it becomes necessary to replace the 40-watt lamps, of which there are four to each division.

ILLUMINATED MAP IN TRANSPARENT COLORS SHOWS ELECTRIC RAILWAY'S SYSTEM

The maps are painted on plate glass divided into three removable pieces which are separated by copper beading. In the accompanying illustration is shown the interurban map on which in transparent colors the company's lines are shown in red, rivers, lakes and sea in blue, names in white, stations in red and land in black. On the opposite side of the entrance a second map shows the city, system, while over the opening there is an ordinary electric sign "B. C. Electric."

The installation is part of a broad policy of publicity intended to promote good-will toward the company and has been the object of much curiosity.

The National Association of Manufacturers directs attention to the "Safety Picture Books," which may be purchased at cost, $2.50 per hundred or $20 per thousand, from the Conference Board on Safety and Sanitation, West Lynn, Mass. These books are suitable for slipping into pay envelopes.

What Are Fair Rates of Return?*

Not Measured by Security Yields but by Net Earnings Sufficient to Attract Necessary Capital—Surplus Earnings Are Demanded by Investors—Other Terms Necessary to Induce Investors to Furnish Capital

By HALFORD ERICKSON
Hagenah & Erickson, Consulting Engineers, Chicago, Ill.

WHAT constitutes fair returns upon a fair valuation of the investment, while it embraces many ethical features, is primarily a question of facts. These facts are found in the business world. Fair return in its broadest sense means fair allowances for rent of land, for wages of labor, for interest on the capital used and for profits on the services of the *entrepreneur*. That is, it means reasonable compensation for each of the factors of production. In a narrower sense fair returns are limited to reasonable amounts for interest and profits. While interest and profits thus represent the returns for two separate factors of production, the resemblances between them are close enough for them to be discussed together. Fair returns for interest and profits depend upon so many conditions, and differ so much from one set of conditions to another, and from time to time, that it is, and probably always will be, impossible definitely to lay down in a law or a decision a fair rate of return under each set of conditions.

In interpreting what is meant by the term fair returns, for example, some hold that it is the return or cost at which the necessary capital for proper developments can be had. Others say that the fair return is measured by the income basis upon which the existing securities of an enterprise, or similar securities of other enterprises, are selling in the open market. The former of these two views seems to be in line with the best interests of both the public and the investor; the latter appears unjust to both.

SECURITY YIELD IN OPEN MARKET IS NOT FAIR RETURN

The yield or income basis upon which securities are ordinarily selling in the open market does not, as a rule, represent a fair basis for returns for interest and profits. There are several reasons for this. The income bases computed from the rates of interest and dividends borne by the securities and from the market prices of these securities do not represent the net earnings and the amount of property required by the investor for the protection of the securities in order that they may sell in the market on the income bases in question. Moreover, the market price of the securities, as a rule, fails to take into account such expenses as the discounts at which the securities may have had to be sold, the commissions charged for marketing the securities, and the legal and other costs connected with issuing them. It also frequently happens that the securities, for special reasons, such as the desire for control, or family and other relations, are selling at much higher prices than would be obtained if the yield or income was the only element that entered into their price.

Among the conditions upon which investors can be induced to furnish capital is, protection against risks to both the principal and the income thereon. Bonds, in order to be safe, must have behind them much more property than their face value, and much greater net earnings than the amount required for interest on the bonds. Likewise, the stock, in order to be reasonably safe, must also have property and equities behind it, as well as much greater net earnings than the amounts or rates regularly paid as dividends thereon. These excesses in property value and net earnings over the face value of the securities, and over the interest and dividends directly paid thereon, constitute a margin of safety which must exist or be reasonably well assured if capital is to be had upon terms favorable to both the plants and the public. It is clear, therefore, that the real cost of the capital and of the *entrepreneur* is represented not by the income bases, but by the combined amounts of what is regularly and fairly paid as interest and dividends, plus such margins for safety as the investor may require. Yet there are many who still cling to the income basis view and endeavor to put their views into effect. These efforts are extremely detrimental to all concerned. They are unfair to the plants and injure their credit. They are also harmful to the public, for they ultimately retard extensions of the service and tend to lower the quality of such service.

One is thus forced to fall back upon the first of the two sets of views outlined above, namely, the one which holds that the fair returns are represented by such net earnings as those upon which the necessary capital can be had. Such net earnings include not only the necessary annual interest and dividend charges, but the average annual proportion of all necessary discounts, commissions and other expenses connected with the issues, together with such margins of safety in the way of surplus earnings as the investors may require for their own protection.

WHAT THE INVESTORS REQUIRE

As already stated, what is a fair rate of return for interest and profits is largely a question of facts. In order to throw some light on this complicated question, extensive inquiries have been made into the terms and conditions upon which investors can be induced to furnish capital under various conditions. Since the facts collected represent actual experience in such matters, it is believed that the terms disclosed for public utility investors are approximately correct. They may be summarized as follows:

Investors in order to furnish capital on bonds on a 5 to a 5½ per cent interest basis appear to require that the principal of such bonds shall be protected by property and equities worth not far from twice as much as the par value of the bonds; that the interest charges on such bonds shall be protected by net earnings that amount to about twice as much as such interest charges; that the future prospects of the road or utility shall be such that as far as can be judged the financial condition of the plant is likely to improve, and that the stated income basis shall not, as a rule, include the cost of discounts, commissions and issuing expenses. Such expenses must, therefore, be borne by the plant in addition to the interest charges.

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*Abstract of paper presented at meeting of Wisconsin Electrical Association, Milwaukee, March 14-15, 1917.

Investors, in order to furnish capital on stocks, mostly appear to require that such stock shall not amount to much more than the amount by which the fair value of the property and equities exceed the par value of the bonds which come ahead of such stock; that the net earnings of the company on such stock shall amount to from one and one-half to twice as much as the ordinary dividends of, say, 6 per cent, which are regularly paid in such cases; that in addition to such regular dividends the stock also receive occasional extra dividends; that existing stockholders be permitted to subscribe for new stock at lower prices than those which the stock in question brings in the market; and that the future prospects of the plant, in so far as they can be foreseen, shall be such that the present relations between such stock on the one hand and the net earnings on the other are at least likely to be maintained in the future. In addition, there may also be expenses for discounts, commissions, etc., to be borne by the plants.

When the demands of the investors are less drastic, it is usually because of special conditions which happen to obtain. Bonds and stocks which are not so well secured as those specified in the above requirements must be placed on terms which, as a rule, are much less favorable to the borrowers. Securities which do not come within these rules are usually regarded as speculative in character and are taken by speculators rather than investors. They are so taken on terms and conditions that are supposed to be favorable enough to the taker to offset the speculative features or extra risks involved. These terms are usually such as to make the cost of capital too high for most business purposes.

THE NEED OF SURPLUS EARNINGS

The terms and conditions, including the margins for safety which are thus demanded by the investors, plus the cost of discounts, commissions and certain other expenses, represent the true cost of capital which, in the long run, must be borne by the public or those who use the service. It is true that a part, at least, of this cost is sometimes shifted from the consumers to the investors through refusals to grant reasonable rates. Under normal conditions in other respects, however, such shifting is not fair, and cannot become permanent. The utilities must pay the ruling prices for all the labor, material and capital which they employ in the service. These prices are fixed, in the open market, by forces over which the utilities have little or no control. If these outlays are not covered by the rates which the utilities are permitted to charge, they cannot permanently remain in the business. This applies as much to the surplus earnings as a margin of safety, which is demanded by the investors for their protection, as it does to any other item of cost. Such surplus net earnings constitute a part of the compensation, over and above the regular dividends, which investors demand for the risks they assume.

Risk is a factor that varies, but there are no industrial undertakings in which it is not present. When its cost is not covered by surplus earnings, it is included in the higher interest, dividend and other charges which the investors exact. The money cost to the public of the capital obtained is, therefore, likely to be fully as great under the lower as under the higher earnings. Under normal conditions there appears to be no way in which the public will derive any permanent benefit from refusing to allow rates for the service obtained that are high enough to yield the small surplus that is necessary to maintain the credit of the utilities. Even if there were instances where the direct money cost would be a little less when no surplus is provided for in the charges for the service, the slight savings from this source would certainly, in the long run, be fully offset by poorer facilities and services and by less adequate provisions for safety in other respects.

PRICE OF CAPITAL VARIES

The price of capital varies from one period to another. The investigations upon these points indicate that bonds, which are protected by such surplus property and net earnings as those demanded by the investor, were selling on about a 4 per cent income basis from about 1900 to about 1907. In the latter year, however, the yield demanded increased to about 4½ per cent, and remained at this figure up to about 1909, when it again increased to about 5 per cent. In 1913 and 1914 it rose to over 5 per cent. On investment stocks of the kind described above the yield demanded by the public, in addition to a surplus for safety, was from 1 per cent to about 2½ per cent greater than the yield thus demanded on the bonds.

Such increases in the cost of capital is felt more strongly in the junior and weaker securities than in the better underlying first mortgage bonds. The prices on first mortgage bonds of the better kinds, both in times of stress and in times of prosperity, usually change so slowly that the yields on their market price do not furnish a very accurate index to the course of the cost of capital. But, while all this is true, there has been a marked tendency, during the last ten years or more, on the part of the better bonds to fall in price. The main reason for this is undoubtedly found in the effect of rising prices of commodities on the purchasing power of the income from the bonds.

EFFECT OF REGULATION

Under strict regulation, most speculative opportunities are eliminated. Those who hold stocks, for instance, may not be permitted any benefits from increasing values due to social growth, or any considerable proportion of the increased profits derived from growths in the business and from general developments. Speculative opportunities of this kind are much cherished. They have in the past regularly caused investments to be made on much lower bases of returns than those at which capital could otherwise have been had. With the growing tendency under regulation to take away such speculative opportunities, there has also arisen a tendency on the part of the investors to demand higher rates of income.

The effect, upon the rates of return or on the cost of the capital, of adverse political conditions and actual or proposed legislation may also be illustrated by the case of the steam railroads. These points are not mentioned as an argument against regulation, for regulation in some form is necessary and has come to stay. They are simply cited as examples of how easily the credit situation may be disturbed in such a way as to injure public interest, and how necessary it therefore is for the commissions to be guided by sound economic and business principles.

WHAT THE UTILITIES NEED

Many roads and many other utilities are not in such a situation with respect to their credit or property and earnings that they are likely to be able to secure all the additional capital they need on reasonable terms and conditions. Even where the value of the plants and of the business equals the outstanding securities the earnings on the stock are frequently far from high enough to place such stock on an investment basis, or to induce investors to furnish capital thereon. In fact, the situation with respect to the earnings is often distinctly unfavorable; that is, the earnings are often too low to be reasonable and much below the level at which new capital can be had, particularly on stocks. This forces utilities to obtain additional capital on bonds alone, and this, in turn, tends to cause the proportion of the bonds of the total capitalization to become too high for safety. In hard times an unduly large bonded indebtedness is likely to mean receiverships with all the losses and disturbances that are entailed thereby. It is seldom safe to let that part of the capitalization which is represented by bonds greatly exceed 65 to 75 per cent of the total amount of both the stocks and the bonds.

Under ordinary conditions utilities must have net earnings for interest on bonds, dividends on stock and a surplus for safety, altogether amounting to not less than about 8 per cent on the fair value of the plant, its equities and business. With such net earnings, and when the bonds do not cover more than from 50 to 75 per cent of the total value, the bonds would probably sell in the market on about a 5 to 5½ per cent income basis, while the stock would be likely to sell at prices on which the yield would amount to from 1 to 1½ per cent more than this. With a much lower net income than about 8 per cent the plant could not very well be placed in the investment class.

Progress in Accident Reduction

Some Information Regarding the Safety Work of the Railways Honored This Year by the American Museum of Safety

As announced in the issue of the ELECTRIC RAILWAY JOURNAL for March 17 the Anthony N. Brady memorial medal has been awarded by the trustees of the American Museum of Safety to the Connecticut Company, New Haven, Conn., L. S. Storrs, president. Honorable mention was also accorded to the Pacific Electric Railway, Los Angeles, Cal., Paul Shoup, president, and to the Interstate Public Service Company, Indianapolis, Ind., Chester P. Wilson, president. The readers of the ELECTRIC RAILWAY JOURNAL will naturally wish some detail of the safety work of these companies in view of their selection by the committee on award of the medal for this signal honor. A brief summary of this work has, therefore, been prepared.

OPERATING CONDITIONS IN CONNECTICUT

The Connecticut Company operates 689 miles of track in Stamford, Norwalk, Bridgeport, Derby, Ansonia, New Haven, Waterbury, Meriden, Middletown, New Britain, Hartford, Torrington and Winchester and between a number of these cities. In some of these cities the streets are narrow and far from straight, and at many points the population is considerably congested.

During the year covered by the award the company operated 1519 passenger cars, thirty-four freight cars and 314 miscellaneous cars, requiring the services of 2408 men connected with the movement of cars and 1904 industrial employees, the average total number of employees being 4218.

The safety work of the company has of late been rendered more difficult than usual on account of the influx of population due to the increase in manufacturing resulting from the war. The Winchester Repeating Arms Company and the Marlin Fire Arms Company in New Haven, the Remington Union Metallic Cartridge Company in Bridgeport, the American Brass Company and the Farrel Foundry Company in the Naugatuck Valley, the Scovill Manufacturing Company in Waterbury and the Colt's Fire Arms Company in Hartford, are among the many concerns which have expanded enormously in the last few years. The peak loads on the railway system caused by the opening and closing of these factories have made safe railway operation very difficult.

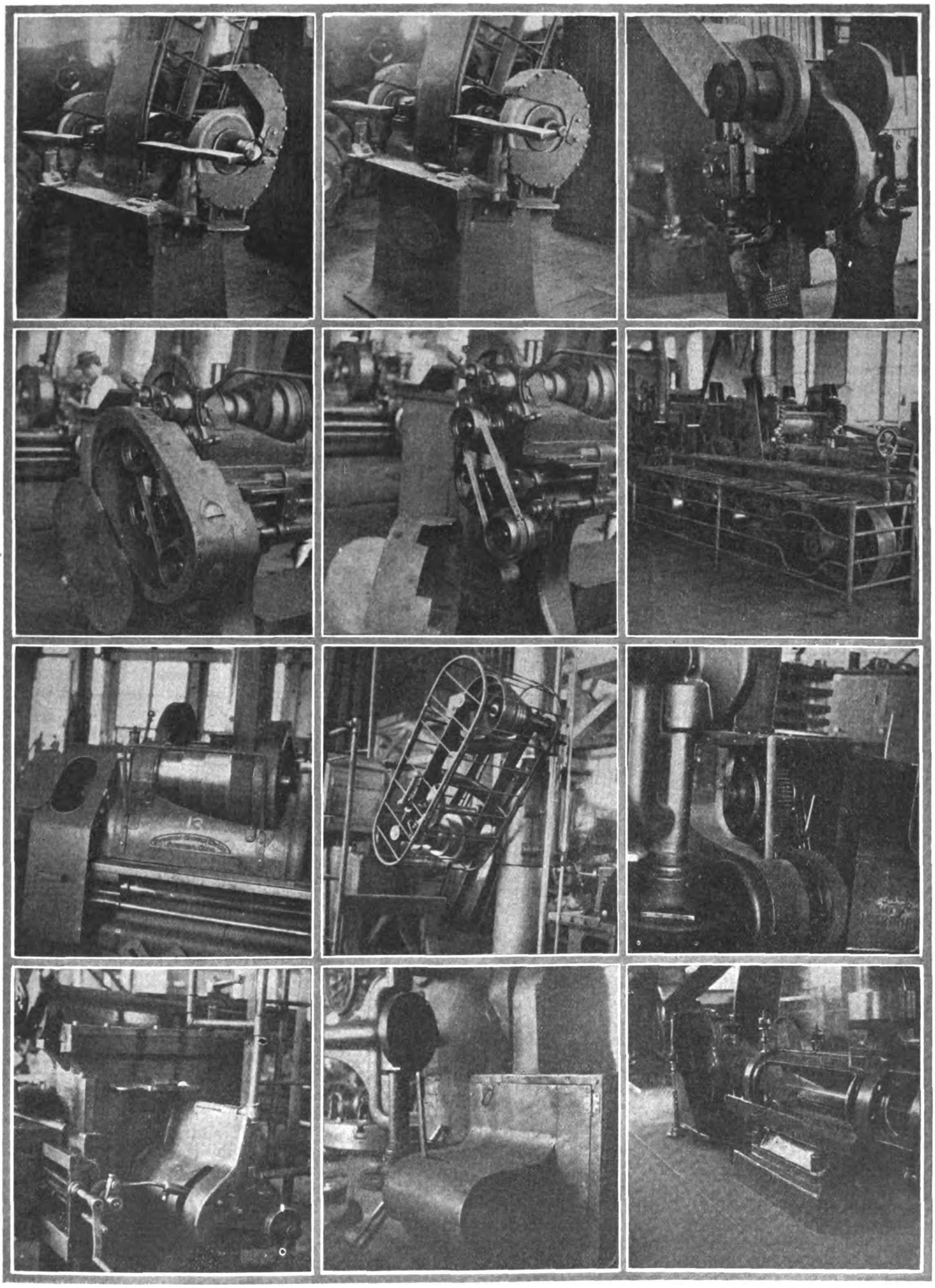
Furthermore, the demand for capable mechanics on the part of the manufacturing companies has been so great that the railway has found difficulty in retaining the services of men competent to maintain the equipment, and, in some cities, there was even a shortage of men suitable for car crews.

In addition to the endeavor to maintain equipment in the best possible operating condition, to safeguard operation at grade crossings, and to reduce industrial accidents to a minimum, the company has made an unusual effort to stimulate public interest in safety. For example, for several years back the New Haven division has conducted a contest among school children, as described in earlier issues of the ELECTRIC RAILWAY JOURNAL. One feature of this was to have the motormen who passed the several schools in the city make reports, covering a week each, upon the number of children who appear to be school children who step carelessly from the curb to the street. The children in the schools were then told that they had been watched at a period in the past and would be watched at a period in the future, and that a reward was to be given for the school which had made the greatest improvement. Later the same motormen made reports on similar observations, and from these reports the school having the best record was determined. The company furnished this school with the necessary number of cars to take the teachers and pupils to one of the local amusement parks for an afternoon, a holiday being granted for the purpose by the school authorities.

In order to secure the co-operation of the schools over the whole territory touched by the company's lines, prizes were offered last year for the best essay by a school child on the subject "How I Keep Safe Upon the Streets and Roads." Nearly 1000 essays were submitted in this competition. Three awards each of $20 and $10 gold pieces, were made in high schools, grammar schools and rural schools respectively. The prizes were awarded with appropriate exercises and the newspapers gave hearty co-operation in the contest, the more prominent Sunday papers featuring it with reproductions of the winning essays and pictures of some of the winning pupils.

Among the employees the policy of interesting all of them in the efforts of the company to protect them as well as the public from accident is systematically followed. Typical of this are the line foremen's meetings, which are held monthly. In these there are general discussions as to methods of construction, standards, safety measures and other practical matters. Another helpful feature has been the posting on bulletin boards of the records of the several divisions, giving comparative standings of divisions on the basis of passengers injured in relation to passengers carried.

For the benefit of the men, the company issues to all interested neatly bound books on the following subjects: "Rules and Regulations for Employees," "Instructions for Safety of Employees," and "Rules for Resuscitation



Safeguarding Machinery on the Pacific Electric Railway

Typical Illustrations Showing Some of Schemes Which Were Used for Surrounding Gearing and Other Dangerous Parts of Tools, Etc., in the Shops and Power Plants of This Company from Electric Shocks." The rule book is revised periodically by a committee composed of managers and superintendents, and later the changes and additions are discussed in a meeting of all the managers and superintendents.

The management of the company considers also that the local company section of the American Electric Railway Association has been a factor in promoting interest in safety matters. Addresses on the subject have been given before large audiences, supplementing the efforts made in the several departments.

ACCIDENT RECORD OF THE COMPANY

During the year covered by the report made to the medal committee but one person was killed in train accidents and there were no fatal accidents among industrial employees. Twenty persons were killed in casualties other than train accidents, but of these a number were individually responsible. Reduced to unit figures it appears that for each 1,000,000 car-miles run 0.035 person was killed in a train accident and 0.7 in other than train accidents, while 6.0 and 31.5 were the corresponding numbers of those injured. The injuries to industrial employees, many of which were trifling, not resulting from the movement of cars, were at the rate of 23.6 per 1000 employees.

It is the custom of the company to set aside at the beginning of each fiscal year an arbitrary percentage of the gross earnings as a casualty and insurance reserve. This is estimated for each division and the division records are kept separately so as to create a friendly spirit of rivalry among the local managers in the interests of safety. This procedure also seems to provide an accurate method of bookkeeping. The reserves for the nine divisions together with the actual percentages spent based on passenger earnings were as follows: New Haven, reserve 5 per cent, spent 2.55 per cent; Meriden, 2, 1.08; Middletown, 3, 0.42; Hartford, 4, 1.72; Stamford, 5, 2.02; Bridgeport, 4, 3.28; Waterbury, 5, 3.41; New Britain, 5, 1.84; Torrington, ½, 0.22. A table compiled for eleven years shows results fairly consistent with these figures, although there are, of course, occasional exceptionally high expenditures.

During the year covered by the report on which the award was made the company spent 2.39 per cent of the gross passenger earnings on claims cases and claims settlements, including the necessary legal, medical and other administration expenses in connection therewith, together with all expenses under the compensation act. The company did a freight and express business of more than $500,000 also, and if this is included the percentage is 2.26. This record is considered unusually satisfactory in view of the fact that on account of the high wages in the territory larger settlements for injuries are necessary than would have been made earlier for accidents of the same seriousness to the same individuals.

OPERATING CONDITIONS ON THE PACIFIC ELECTRIC RAILWAY

The Pacific Electric operates a total mileage, in single-track equivalent, of nearly 1060. The number of passengers carried during the year 1915-1916 was more than 75,000,000. The system comprises lines in a large number of cities in southern California and extensive interurban mileage. During the last seven or eight years the interurban passenger and freight business of the company has increased in large proportion. The population served aggregates about 750,000 and the system covers about fifty cities and towns.

The company handles the safety problem very systematically through a committee in each of the four divisions. Each of the committees is made up of the division superintendent (chairman), the assistant superintendent, a trainmaster, a dispatcher, an interurban conductor, an interurban motorman, a city-line conductor, a city-line motorman, a freight conductor, a freight motorman, a representative each from the claims, maintenance-of-way, electrical and mechanical departments, and a secretary. The committee meets monthly and the matters which are discussed affect division practices solely. Where no investment is required the necessary actions are concluded by these committees.

On matters pertaining to systems, standards and practices, or involving investment, the division committees present their conclusions in the form of recommendations to the central safety committee. This comprises the general manager (chairman), the general superintendent, the superintendents of the four divisions, the assistant chief engineer in charge of maintenance, the electrical and mechanical superintendents, the general claim agent, the general storekeeper and a secretary.

As a result of the work of these committees during the past four years hundreds of recommendations have been considered and many have been put into effect.

The accompanying photographs are reproduced to illustrate the care with which the dangerous parts of machines in the shops and power houses of the Pacific Electric are safeguarded. No care or reasonable expense has been spared to protect workmen, and the same principle has been applied to the equipment on the cars.

INTERSTATE PUBLIC SERVICE COMPANY

The Interstate Public Service Company is a subsidiary of the Middle West Utilities Company and operates under lease the Indianapolis, Columbus & Southern Traction Company, which connects Indianapolis, Greenwood, Franklin, Edinburg, Columbus, Seymour, with connections for Louisville, Ky. It has a trackage of 9.4 miles in city limits and 52.6 miles on private right-of-way.

While during the year covered by the report two persons were killed in train accidents, these were trespassers, and there were no other fatalities in any department of the service. Moreover, the injuries to persons in train accidents were few and there were practically no other accidents of any other kind. The company holds frequent meetings of trainmen and other employees, and makes a special feature of safety advertisements in its cars.

Safety Medals Awarded

The American Museum of Safety, Arthur Williams, president, has announced the findings of the jury of awards covering four of the five gold medals which are given annually by the Museum for noteworthy achievements in the realm of safety. The medal not yet awarded is the E. H. Harriman medal which recognizes safety work in the steam railroad field. A preliminary announcement, authorized by the museum trustees, of the award of the Anthony N. Brady medal and replicas, and of the recognition of the commendable safety activities of two railways by "honorable mention," was made in the March 17 ELECTRIC RAILWAY JOURNAL. The article just preceding is an elaboration of that announcement. The Scientific American medal was awarded to the Pullman Company for originating the Dean end frame for passenger cars. This device is a reinforced 8-in. channel beam bent in an inverted U-shape to form the side of the vestibule connecting door between cars. The beam is carried under the car platform to a union with a steel underframe of the car. The Dean end frame armors the end of the car against telescoping. The Louis Livingston Seaman medal was given to the Julius King Optical Company, New York City, as a recognition of its scientific investigation of the effect of colored lenses worn by workmen whose eyes are exposed to the blinding glare of metal melting and refining operation, oxy-acetylene welding and electric arc welding. The award also covers work done by the company in perfecting safety goggles for chippers and sanitary and efficient helmets for industrial workers. The Travelers' Insurance Company medal was given to the Commonwealth Steel Company, St. Louis, Mo., for its safety systems, protective devices, sanitary methods applied throughout the plant and fellowship work among employees.

Action for National Defense

Association Committee Has Conference with Secretary of War and Outlines Plans for Immediate Adoption by Electric Railway Companies

THE committee on national defense of the American Electric Railway Association, the outgrowth of the committee to co-operate with the War Department authorized at the 1916 mid-year meeting, has been actively engaged in preparing a program to be followed by the electric railways toward national defense. The plan is to work in connection with the National Council of Defense, and a meeting with this council and the executives of eighteen trunk line railroads was held in Washington on March 1. The electric railway representatives in attendance were General Harries, chairman, and Messrs. Storrs, Allen and Burritt. Plans were made which were laid before the full committee on national defense of the American Electric Railway Association on March 26.

This committee, which has recently been appointed, consists of the following:

Gen. George H. Harries, chairman, president Omaha Electric Light & Power Company, Omaha, Neb.

F. R. Ford, vice-chairman, Ford, Bacon & Davis, New York.

L. S. Storrs, vice-chairman, president The Connecticut Company, New Haven.

B. I. Budd, vice-chairman, president Metropolitan West Side Elevated Railroad, Chicago.

C. Loomis Allen, vice-chairman, Allen & Peck, Inc., Syracuse.

P. H. Gadsden, vice-chairman, president Charleston Consolidated Railway & Light Company, Charleston, S. C.

L. C. Bradley, vice-chairman, Stone & Webster, Houston, Texas.

W. R. Alberger, vice-chairman, vice-president and general manager San Francisco-Oakland Terminal Railways, Oakland.

A. H. Ford, vice-president and general manager Cumberland County Power & Light Company, Portland, Me.

D. A. Belden, president Massachusetts Northeastern Street Railway, Haverhill.

M. C. Brush, president Boston (Mass.) Elevated Railway.

R. S. Goff, vice-president Bay State Street Railway, Boston.

A. E. Potter, president Rhode Island Company, Providence.

W. O. Wood, president New York & Queens County Railway, New York.

E. A. Maher, Jr., vice-president and general manager Third Avenue Railway, New York.

Capt. A. R. Piper, general freight agent Brooklyn (N. Y.) Rapid Transit System.

Thomas N. McCarter, president Public Service Corporation, Newark.

F. S. Whitten, secretary-treasurer Jersey Central Traction Company, Wilmington, Del.

C. L. S. Tingley, second vice-president American Railways, Philadelphia.

T. A. Cross, vice-president and general manager United Railways & Electric Company, Baltimore.

R. D. Simms, treasurer Capital Traction Company, Washington.

J. N. Shannahan, chairman board of directors Newport News & Hampton Railway, Gas & Electric Company, Hampton.

Raymond Hunt, assistant general manager Tidewater Power Company, Wilmington, N. C.

H. C. Foss, general manager Savannah (Ga.) Electric Company.

M. S. Sloan, general manager New Orleans Railway & Light Company, New Orleans.

Alba H. Warren, manager Galveston (Tex.) Electric Company.

B. M. Warner, general superintendent San Diego (Cal.) Electric Company.

J. H. Wilson, president Mobile Light & Railroad Company, Mobile.

Paul Shoup, president Pacific Electric Railway Company, Los Angeles.

A. W. Leonard, president Puget Sound Traction, Light & Power Company, Seattle.

F. T. Griffith, president Portland Railway, Light & Power Company, Portland, Ore.

This committee held a meeting in New York on March 28, those present being Messrs. Harries, Storrs, F. R. Ford, A. H. Ford, Allen, Goff, H. B. Potter, Anderson, Wood, Piper, Schneider, Tingley, Simms, Hunt and Gadsden.

Announcement was first made of the appointment of a vice-chairman of the committee for each military district, to be responsible for the collection of data and other work required from the railways in the program of national defense. The list follows:

Northeastern District, L. S. Storrs, New Haven.
Eastern District, C. Loomis Allen, Syracuse.
Southeastern District, P. H. Gadsden, Charleston, S. C.
Southern District, L. C. Bradley, Houston, Tex.
Western District, W. R. Alberger, Oakland, Cal.
Central District, Britton I. Budd, Chicago.

General Harries explained that the steam railroads have been districted in the same way by the American Railway Association. The vice-chairman of the electric roads with the vice-chairman of the steam roads and the district military commander will form a committee of three under the War Department to take charge of all transportation matters in that district.

Frank R. Ford then explained what data would be required from each company. The first thing to do is to prepare a map of the company's lines and fill out a data sheet which will be sent to each company by the committee. These maps will all be to the same scale and will show the interurban electric lines, the steam railroads, the locations of power houses, substations, government posts, fortifications, mobilization points, bridges, viaducts, tunnels, whether the clearances are of the American Railway Association standards or not, grades over 2 per cent, safe loading of bridges, transmission lines if other than 600 volts d.c., etc. It is the purpose of the committee to send to each company an outline map of the territory covered by its lines, this map to show coast lines and rivers, and on it the railway data can be indicated by the company. The committee will also send a sample map as a guide to the way in which these maps should be prepared. Such a sample map prepared by The Connecticut Company for the district about New Haven was submitted at the meeting of the committee.

The data sheet which will be sent to each company will call for information concerning minimum headway possible, extent of shop facilities and certain physical features of the property, especially the extent to which the lines can receive steam railroad equipment and steam locomotives. This will indicate whether in the shipment of men and supplies it will be necessary for the government to break bulk in shipment.

At present it is proposed to prepare these maps for lines within 10 miles of the coast, as this is considered by the National Council of Defense the most important information desired. When this is obtained, the committee will get similar information for lines back as far back as 100 miles and then for the entire country.

American Committee on Electrolysis Completes First Stage of Work

Comments of Prominent Engineers in Several Fields Actively Identified with American Committee

THE preliminary report of the American committee on electrolysis, of which Bion J. Arnoid, Chicago, Ill., is chairman, is now before the interests which co-operated in its production, for their consideration and approval. While, of course, the report speaks for itself, the fact remains that it has so far not been given extensive publicity. As the organizations interested have not in general expressed themselves regarding the report the committee does not yet feel justified in publishing it formally. However, it is highly desirable that the electric railway industry be familiar with what the committee has done in order that the results of its work may be utilized. Copies of the report can be procured at $1 each from the secretary of the American Institute of Electrical Engineers, New York City.

In order to obtain for the readers of the ELECTRIC RAILWAY JOURNAL an estimate of the work so far accomplished, a representative of the paper interviewed several members of the committee, one each from the groups most closely related to the electric railways in the solution of electrolysis mitigation problems. Among these was F. N. Waterman, consulting engineer, New York City, one of the A. I. E. E. members of the committee.

MR. WATERMAN'S REMARKS

Mr. Waterman said that he believed that the thought which inspired President R. D. Mershon of the American Institute of Electrical Engineers to propose the formation of a joint committee to investigate the subject of electrolysis was that it should be possible for a body of broad-minded engineers, connected with the affected interests, to agree upon a sufficiently large number of fundamental facts, growing out of their experience; to remove the subject from the field of mere legal controversy and establish it as a definite engineering problem capable of analysis and, therefore, of definite remedial treatment. Such an agreement would point the way for further investigation and accumulation of data and promote that mutual understanding of the divergent points of view which is a necessary prerequisite to co-operation in the application of protective measures.

The report recently submitted represents those statements of fact which the representatives of several organizations have been able to agree upon, and the spirit of friendly co-operation which has been manifested in its preparation is, in itself, evidence of the wisdom of the original thought.

It can no longer reasonably be contended that there is no such problem, that the problem does not arise by reason of stray currents, that the fundamental conditions occasioning it cannot be ascertained, or that the damage cannot be reduced by proper construction of and remedial measures applied to both the current distributing and the affected structures.

The report goes far toward the justification of the original hope that the whole subject might be placed upon a sound engineering basis, that it might be approached in a spirit of co-operation instead of antagonism and that, eventually, it may be possible so far to assemble the facts and principles involved that definite recommendations can be agreed upon as to conditions which should govern construction and remedial measures which may be applied.

A WORD FROM THE WATER-WORKS UTILITY

Alfred D. Flinn, deputy chief engineer Board of Water Supply, New York City, was one of the representatives of the American Water-Works Association on the Committee. In Mr. Flinn's opinion the preliminary report of the committee has not received the general notice which is its due. This report, he stated, is notable for several reasons. It has demonstrated that under proper leadership, with tenacity of purpose, representatives of present-day technical organizations can be brought together to accomplish constructive work; that they can harmonize differences, and that men of ability occupied with many important duties will take time for such service when convinced that the object to be attained is worth while.

On the specialized subject of electrolysis, heretofore much beclouded by incompleteness and inaccuracy of statement, the preliminary report presents a body of facts with a completeness, clarity and accuracy of statement unattainable except by such a co-operation of minds trained and experienced in the consideration of the many sides of this problem. Very naturally, patience, tact, fair-mindedness, prolonged study and honest endeavor to see "the other fellow's side" as well as one's own, were necessary, but the result has justified the hard work and the time consumed. An unusually valuable technical report was unanimously adopted by representatives of interests which, at the outset, were reputed to be so far apart and so antagonistic that they could not be brought to agree, even upon a statement of facts in the case. Even camps so wide asunder as water-works men and electric railway engineers found a basis for co-operation, and have at least begun to see possibilities for the adjustment of their apparently mutually conflicting interests so as to conserve the properties of both at a reasonable cost for protective measures.

It was very clearly established by the committee's conferences that all the services rendered by the various interests represented were demanded by modern communities; that in some instances, one, and in other instances, another of these interests had been the first in the field, and that all depend for their financial success upon the individual and communal prosperity of the inhabitants of the territory served. It became evident that co-operation and mutual fair play are more advantageous to all concerned than the bitter and costly legal contentions arising from disregard of the rights of others or ignorance of remedies for physical difficulties, which have heretofore been too common a feature of the attempts to settle electrolysis troubles. Definition of the rights and control of the practice of the several interests by the community through laws or ordinances, have been shown to be possible and effective.

A firm foundation of fact having been laid in this preliminary report, let the committee proceed courageously in the same earnest spirit of co-operation and fairness to accomplish the remaining portion of its task, namely, the preparation of a report which will set forth reasonable and practical rules for the control of electrolysis and the prevention or mitigation of its ill effects. The preliminary report should be read carefully by all persons interested in any way in the subject of electrolysis.

PROFESSOR GANZ SPEAKS FROM THE GAS INDUSTRY STANDPOINT

Albert F. Ganz, professor of electrical engineering, Stevens Institute of Technology, Hoboken, N. J., was a representative of the American Gas Institute on the committee. In commenting on the matter Professor Ganz called attention to the lecture which he delivered this month before the New England Water-Works Association on the subject of electrolysis troubles and their remedy. He took occasion in this lecture to direct attention to the committee report. In the professor's opinion the committee has already accomplished a great deal toward producing a closer co-operation among the interests owning the electric railways and those owning the underground structures. It is his hope that the future work of the committee will result in the unanimous adoption of recommendations which will reasonably safeguard underground piping systems against electrolysis.

The point of view from which Professor Ganz looks at this matter is that the railway companies in common with the pipe-owning companies are public utilities operating under public franchises and utilizing city streets. It is, therefore, the duty of both of these utilities to co-operate in order that the causes and extent of any danger from stray current can be more readily ascertained. Further, the satisfactory solution of the electrolysis problem is one which requires the co-operation of all the interests concerned. In the past the "red flag" has been waved too much, and some owners of underground property have made unreasonable demands. The result has been that the electric railway companies have hesitated to co-operate for fear that they would be asked to make excessive expenditures.

There is no real reason for this condition, as electrolysis presents engineering problems and can be handled by engineering methods in such a manner that hardship neither need be imposed nor should be imposed on anyone. There is no reason why the negative feeder system should not be laid out along the same engineering lines as the positive feeder system, and if the electric railway companies realized this and the owners of underground properties would co-operate in a practical way, we could obtain a satisfactory and practical solution of the whole problem. As an example he cited the fact that often the judicious installation of a few insulating joints in a pipe line would save a lot of money in railway track feeders and, of course, in such cases the joints should be installed. In view of all of these facts the formation of the joint committee constitutes a most important step toward securing the co-operation which is absolutely necessary to obtain adequate and permanent relief from electrolysis.

MR. TORCHIO MAKES PLEA FOR CONTINUED CO-OPERATION

In the opinion of Philip Torchio, chief electrical engineer New York Edison Company, a representative of the National Electric Light Association on the committee, the fact that the representatives of the several interests concerned have agreed upon it should commend the report to engineers generally. This fact indicates recognition of the principle that electrolysis mitigation is a problem for all concerned. While much has been done the greater difficulties of the work are in the future. To arrive at any conclusions as to what should be done in a particular case, it is necessary that the engineer and the executive shall have before them a complete analysis of the situation and of the relevant existing facts. The interests affected are of such great magnitude that no one would dare to theorize in the matter.

No decisive step can be taken toward complete agreement in all fundamental matters affecting electrolysis mitigation unless all parties have complete confidence that the facts are actually as they appear. They must be sure that the recommendations made will, if followed, be of actual benefit and that the remedies advised will not be too expensive to the railways. From the very magnitude of the work it cannot be accomplished quickly; it will require years. Furthermore, it will require the active financial support of every party involved in providing ways and means for collecting the necessary data. In giving this support they will require complete confidence in those who represent them in the committee. Their representatives must be men thoroughly capable of taking a broad view of the study and of its results.

If the pipe-owning utilities and the electric railways give in the future that degree of co-operation which they have shown in the preparation of the preliminary report, and which have been so essential up to this point, the successful completion of the remainder of the task is assured. In due time there is no doubt that the committee can accomplish work which will save money for all concerned, both in reducing actual losses and in eliminating causes of dispute.

There should be no great difficulty in connection with new construction in the future, but the principal difficulty will be in ameliorating conditions with existing structures. The work of the committee should eventually result in plans for reducing electrolytic corrosion to an economical minimum in ways which will be acceptable to the electric railways, and which will give a result satisfactory to the pipe-owning utilities.

Enemies of Publicity*

Politicians and Public Officers Deny to Corporations an Equal Right of Laying Their Case Before the Public

BY IVY L. LEE
New York, N. Y.

BUSINESS was once done in secret; now corporations are taking their cases to the people in the form of advertising. But this new activity is encountering strange obstacles. Politicians, who once urged publicity in business, now object that corporations are making their publicity effective.

The Bethlehem Steel Company recently advertised its position with reference to its bids for making United States naval shells. It makes no difference whether the case of the company was strong or weak. Any one is free, of course, to comment upon any company's position as he sees fit. But Secretary Daniels, in a public statement, seemed to take exception not only to the company's position itself, but to the fact, as he stated, that the company has "been filling the papers with advertisements," setting forth its position.

The fact was that the company had no thought of criticising Secretary Daniels. The company itself had been under criticism and had simply attempted in this straightforward manner to state its own position to the people. Long before this episode, in a widely published bulletin and advertisement dated April 13, 1916, the company had announced:

"We have allowed irresponsible assertions to be made for so long without denial that many people now believe them to be proven facts. We shall make the mistake of silence no longer. Henceforth we shall pursue a policy of publicity. Misinformation will not be permitted to go uncorrected. It is and has been the policy of our company to deal with the American government in the frankest and most liberal manner. We expect henceforth to place the details of all those relations before the American people."

If any corporation has a story to tell, ought it not to be commended for telling that story frankly and sincerely? Its story may not be convincing, and no one is compelled to agree with it. But is not the policy of at least being perfectly straightforward about a thing something of itself?

In the 5 per cent rate advance case of the railroads in 1913, an aggressive publicity campaign was carried on. The purpose was frankly stated to the Interstate

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*Abstract of address before annual dinner of League of Advertising Women at Hotel Astor, New York, on March 20, 1917.

Commerce Commission before the campaign was undertaken. Every detail of the work was done in the light of day, and everybody knew what was going on. Senator La Follette, speaking in the Senate on May 12, 1914, criticised the fact that "*advertisements* have been run in several of the leading trade journals . . . in the interests of the railroads." Senator La Follette put into the *Congressional Record,* as what he called a "monument of shame," a complete file of the publicity material issued by the railroad in that case, together with the letters and petitions which resulted from the activity of the railroads. In that campaign the entire expenditure of the railroads for publicity amounted to about $12,000. Curiously enough, it cost the people of the United States just about $12,000 to print the material in the *Congressional Record.*

Senator Cummins also violently criticised the railroads for their campaign of publicity. Yet Senator Cummins recently conducted a very active campaign to defeat the reappointment of Mr. Daniels to the Interstate Commerce Commission. Senator Cummins was simply attempting in this way to bring the same kind of pressure —the pressure of public opinion—to bear upon the Interstate Commerce Commission which he had objected to the railroads bringing in their frank campaign of publicity.

PEOPLE ARE ULTIMATE FOUNTAIN OF POWER

The fact is that commissions, Congress, legislatures and courts are under the domination of the people. The ultimate fountain of power in a democracy is, and must be, the people. Corporations should take their case to the people. If their case is sound, the fact that it is presented to the people will secure its approval. If their case is weak, the active presentation of it will but give critics an opportunity thoroughly to bombard it. The people gain in either event. People who attempt to interfere with the progress of advertising in these borderlands of publicity are bound to encounter the same fate as those primeval men who sought to obstruct the progress of civilization in pioneer regions.

The greatest need of the moment is for the railroads, for example, to take their story directly to the people, over the heads of the commissions, legislatures and Congress. If rates are raised, the people must pay the bill, and they will want to know why. Who can determine the adequacy of service except the people themselves? The people are entitled to say what service they want; they are entitled to make it clear to commissions and to Congress that they are willing to pay the cost of providing the facilities which they must have.

Commissions should of course examine all the facts and see to it that everything is "on the level." But is the business discretion of a commission something sacred, embodying a wisdom transcending the wishes of an enlightened public opinion? The fact is that those commissions or the public officers which refuse to accord to the people the right to obtain what they unmistakably desire, are as certain to be overridden by the popular will as the darkness is driven away by dawn.

Nevertheless, railroads and many corporations are to-day reluctant to do that advertising which otherwise they might be inclined to do for fear that they will be criticised by commissions and public officers. They would be accused of trying to buy up the press. They would be accused by commissions of using money to "poison public opinion" which ought to be used in the improvement of service. Yet politicians and public officers, indeed, members of commissions themselves, consider that they have a right without limitation to spread their views before the public and to "sweeten" public opinion.

Newspapers, advertising men and all interested in the progress of democratic institutions—whose ultimate safety must depend upon a fully informed public opinion—should omit no opportunity to make it clear to public officers, commissions, even Congress, that the people want to know. It should, of course, be made equally clear that no one by aggressive publicity methods or by extensive advertising campaigns can expect to secure support for an unsound position. But it should be made so plain that no one can misunderstand that any interest—public or private—which earnestly, sincerely and candidly takes its case to the people shall have strong public support for that fact if for nothing else. In other words, every man is entitled to a full hearing, to his day in the court of public opinion.

COMMUNICATIONS

Safe Tonnage for Wheel Pressing

WHEELING TRACTION COMPANY
WHEELING, W. VA., March 27, 1917.

To the Editors:

From personal observation of broken axles I am convinced that an excessive tonnage used in pressing on wheels is sure to be followed by disastrous results. In all cases of broken axles that have come under my observation the failure has occurred at the wheel seat or gear seat, due to a flaw which was the result of the stress at that point caused by the expansion and contraction of the axle.

Axles of 5-in. and 6-in. diameters are pressed on at tonnages ranging from 150 to 475, and often no means are provided to show what pressure is used. The railway companies should require the manufacturers to press on wheels at tonnages which do not exceed a safe value for the size of axle used, and if the wheels are assembled in the railway shops the wheel press should be equipped with a pressure gage. I have never known of an axle of 0.35 to 0.45 per cent carbon that broke when the tonnage at which the wheels were pressed on was specified.

HARRY BRANSON,
Master Mechanic.

Proposed Conference of Publicity Men

DENVER TRAMWAY COMPANY
DENVER, COL., March 26, 1917.

To the Editors:

A short time ago I had a two-day visit from W. P. Strandborg of the Portland Railway, Light & Power Company, who gave me a wonderful lot of information about what his company was doing in the way of electric railway publicity. About two minutes after we had started talking I had a notebook out and was scratching down about half the things he said, and five minutes after I started to talk he had his notebook out and was jotting down things I said. What were we talking about? Street railway publicity work; nothing more nor less. I was bringing up problems in connection with my work, and he was telling me how he handled those things on his road. He was asking me how we did this and that in Denver and I was telling him, and the information we gave each other was so good and so usable and we got so much of it from each other that we needed notebooks.

I have before me as I write a typewritten summary of the valuable tips, ideas, methods and suggestions he gave me during that two-day convention of two electric railway publicity men, and it covers six sheets, single space. I have been using the information I learned in those two days, and if I had to buy the information outright I'd pay $500 for it.

Some time later this idea occurred to me:

If a two-day "convention" between two publicity men was so valuable to me (and to the other fellow), what would be a four-day conference between all the electric railway publicity men in the country be worth to me as one of them? And what wouldn't it be worth to the other men? And then I thought of the annual conference of the Associated Advertising Clubs of the World at St. Louis during the first week in June and of how tremendously worth while it would be to all of us to sit in a sort of a "round table" of electric railway publicity men in an atmosphere of the big publicity men of the country. And by a round table I do not mean one of these affairs where everybody has a neat little paper to read on some abstract subject. I mean a gathering of men who will split up in twos and threes or quartets and open up wide and discuss their problems and the other fellow's way of doing things in a spontaneous, unreserved manner.

Acting upon this idea I mailed a feeler to a number of other electric railway publicity men and asked them to let me know how such a meeting appealed to them. Twenty of them in as many cities have replied and have promised to be at St. Louis for the proposed conference. This early indication of success of the plan has exceeded any of our hopes. Letters indorsing the whole scheme are coming in at the rate of two to three a day, in nearly every case accompanied by an agreement to attend. A meeting with the American Electric Railway Association at Atlantic City was contemplated, but that suggestion was discarded after discussion with electric railway officials who had attended these conventions. The reasons for this action are best set forth by the following extracts from a letter written by E. E. Soules, publicity manager of the Illinois Traction System:

> Your observation in regard to the American Electric Railway Association is, to my mind, exactly correct. I have been attending the conventions at Atlantic City for three or four years past and in fact have served time as chairman and member of the passenger traffic committee. I am not a traffic man, neither am I an operating man, and I have felt right along that I could be of a lot more good and could get a lot more out of these conventions if allowed to serve on a committee which had under discussion matters of real interest to the publicity man. Even if such a committee existed, which I have advocated for some time, I realize that it would be a matter of a formal presentation of papers and reports on subjects recommended by the executive committee, and we would go away from the convention with very few practical thoughts. And this is not decrying the good or advisability of co-operating with the American Electric Railway Association. The very nature of the street railway business makes that convention about 90 per cent technical.
>
> "With the Associated Advertising Clubs of the World, however, it is different. I have been identified with the work of this organization to some extent also. I was the first president of the Peoria Club, and I believe that the organization is good and alive. Your idea of a round-table gathering is just right. I believe that the utility-publicity man can get a lot of good out of such a meeting. St. Louis is centrally located and easy of access to the majority of fellow publicity men. We can get back in a corner and have a real old-fashioned talk fest that will do us all a lot of good, and, at best, cannot do any harm."

Undoubtedly this is correct. Such a conference as proposed at the Associated Ad Club's gathering would enable us to get a new grip on the public's viewpoint and feeling. The rule in Denver is that the publicity man must be the voice of the public and must never lose the spirit of sympathy with the public's contrariness. In other words—the publicity man ought to keep away from the technique of electric railways.

The electric railway publicity men of the country have never gotten together in such a session, if I am correctly informed. We trust this meeting will be a great success. J. C. DAVIDSON, Publicity Manager.

Setting Trolley Poles with a Rake

SAULT STE. MARIE BRIDGE COMPANY

SAULT STE. MARIE, MICH., March 15, 1917.

To the Editors:

The publication of a letter from C. R. Harte, commenting upon my ELECTRIC RAILWAY JOURNAL article on the desirability of setting poles vertically, leads me to make some further remarks along the same line.

It seems to me that Mr. Harte and many other engineers are prejudiced in this matter, due to the fact that on their roads there are many miles of pole line set with the rake to which I object. As far as the preferences of municipal authorities are concerned, it is my conclusion based on observation that such authorities are far more likely to allow vertical than raked poles to remain on business or residence streets.

Mr. Harte refers to Hogarth's line of beauty as expressed by triangle or arch, but it must be remembered that unless these are plumb they lose their beauty.

J. G. KOPPEL, Electrical Engineer.

Electric Engines Cause Less Delay

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY

BUTTE, MONT., March 29, 1917.

To the Editors:

In the abstract of my paper before the New York Railroad Club, published in your issue of March 24, you make me say in one place that "electric engine failures have caused more delay than steam engine failures." This is an error as the facts are entirely the opposite. Please arrange to publish a correction at an early date. R. BEEUWKES, Electrical Engineer.

[Note.—We are glad to print this correction of our abstract of Mr. Beeuwkes' paper.—EDS.]

AMERICAN ASSOCIATION NEWS

Sub-Committee on Engineering Manual

A meeting of the sub-committee on revision of the Engineering Manual, a part of the committee on equipment of the Engineering Association, met in New York on March 27. Those in attendance were E. W. Holst, chairman, Boston; R. H. Dalgleish, Washington; H. A. Johnson, Chicago; Daniel Durie, Connellsville; W. S. Adams, Philadelphia, and A. L. Broomall, Pittsburgh. The members went over the parts of the Engineering Manual, particularly those on "recommended practice" which seemed to be obsolete or otherwise could be omitted and decided that these parts should be brought up to date and offered to the electric railway press. This plan will reduce the size of the Manual and make it more usable.

Duties and Troubles of the Purchasing Agent

John Fleming, purchasing agent Capital Traction Company, was the principal speaker at the meeting of company section No. 8 held on March 8. Mr. Fleming gave an interesting account of the duties and troubles of a purchasing agent and outlined the system in use by the Capital Traction Company in the purchasing and handling of material and supplies.

President Morrill presided at the meeting, which was attended by sixty-three members and guests. A program of musical numbers, consisting of vocal solos and orchestral selections, furnished entertainment for the section, and at the conclusion of the meeting a buffet luncheon was served.

Practical and Economical Solutions of Problems in

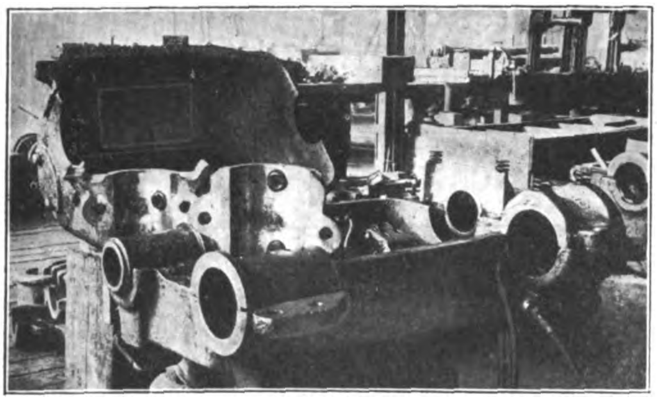
EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Automatic Adjustment to Take Up Wear on Old-Type Armature Bearings Proves Successful

BY G. J. SMITH
Superintendent of Rolling Stock and Shops
Kansas City (Mo.) Railways

In the ELECTRIC RAILWAY JOURNAL for Aug. 26, 1916, page 369, was published a method of eliminating the lubrication difficulties resulting from loose armature bearings in the GE-57 and GE-67 type motors as developed by the Kansas City Railways Company. At the time data for this article were secured, there was no definite information available as to just what was to be gained by this improvement. Such information is now available, however, and it shows such a marked saving as the result of the general use of this device on our cars, that we feel justified in calling attention to the scheme a second time, and in presenting the actual experience.



ARMATURE AND AXLE-BEARING CAPS EQUIPPED WITH SPRINGS TO TAKE UP BEARING WEAR

We have in service 488 GE-57, form H, two-turn motors and 746 GE-67, form A, three-turn motors. The bearings in these are held in position with a cap in which there is a ⅝-in. dowel pin. This dowel pin in time becomes worn on account of the movement of the bearing, and allows the lubrication slot in the bearing to get out of alignment with the slot in the oil or grease box, and thereby permits the oil to pass on outside of the bearing instead of onto the shaft, with resulting lubrication troubles.

Many methods have been resorted to in the past to overcome this result of bearing wear. One method was the insertion of an additional dowel pin, and another, the use of a key or feather in place of the dowel pin. Still another method was to rebore the motor frame with a consequent change of standards in bearing diameters. This latter process, of course, was elaborate and costly, making necessary the use of a large horizontal boring mill. All three methods were more or less temporary in character, since they overcame the trouble for the time being but gave no permanent relief. The method to which we finally resorted and which was described in detail in this earlier issue of the JOURNAL, was the insertion of short coil springs in the armature and axle caps, which would bear against the bronze bearings. Considerable difficulty was encountered in securing the proper spring, but after this was overcome the results in the first few motors in which the experiment was installed were so gratifying that it was decided to equip all motors of these types with the device. By the end of 1916, approximately 90 per cent of the GE-57 and GE-67 motors on our property had been equipped. The following table shows the decreasing number of armature and axle bearings installed during 1915 and 1916, and also the number of armature coils used during the same period, the latter being included for the purpose of showing the reduction in the number of armatures wound and attributed to the better lubrication secured, which prevented hot bearings and armature damage from contact with the pole shoe.

	1915	1916	Reduction
Bronze armature bearings (pairs)	956	392	564
Bronze axle bearings (pairs)	2.056	981	1,075
Armature coils used	27,666	23.965	3,701

The reduction in the number of bearings used is attributable entirely to the use of this spring device for taking up the wear in bearing and dowel pin. As a comparison, our armature failures on motors of a later type which were originally designed for oil lubrication, increased in 1916 over 1915 in approximately the same ratio as the increased mileage made by the motors, while the reductions in the bearings used on the GE-57 and the GE-67 motors was made against an increase in the mileage of the cars equipped with these motors, over the former year.

Heat Box for Calibration of Car Thermostats

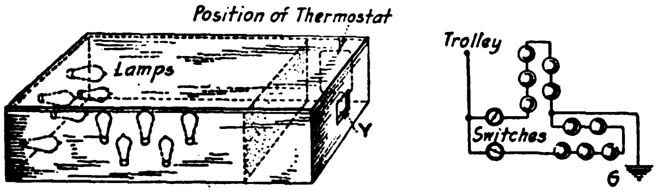
Simple Method of Checking the Performance of Thermostats Without Heating Up the Cars

BY E. D. RANSOM, B.E.

It requires a long time to determine the temperature at which a car thermostat will operate if the whole car has to be heated for this purpose, since it takes about three hours to raise the car temperature to 60 deg. Fahr. when the outside temperature is 10 deg. It is unsatisfactory to apply heat directly to the thermostat if by doing so the rise in temperature is too sudden to permit accurate thermometer readings being taken.

To obviate these difficulties a heating box has been developed which is a great time-saver and gives accurate results. It consists of a wooden box, open at one end and heated by electric lamps which are connected in two circuits, each controlled by a separate switch as shown in the diagram. The box is divided into two compartments, the larger section contains the lamps, and the smaller is placed over the thermostat by fastening the box to the side of the car. The two sections are separated by a strip of thin black cloth which shields the thermostat from the glare of the lamps and at the same time permits radiation of heat.

In testing a thermostat the box is fastened in place and a thermometer is inserted through a small hole in the end of the smaller section of the box. The bulb of the thermometer should touch the mercury column of the thermostat. The lamps in both circuits are then turned on, and the box is heated until nearly the required temperature is reached. The lamps are then turned off and the temperature in the box is allowed to become constant. The set of lamps in the end of the box is then used to raise the temperature slowly to the point at which the thermostat operates. The lamps at the end of the box are used for this purpose since they are more remote from the thermostat and will, therefore, raise the temperature more slowly. Results obtained by this method have checked within ½ deg. of the readings taken during normal heating of the car.



BOX HEATED BY ELECTRIC LAMPS AND USED FOR THE CALIBRATION OF CAR THERMOSTATS

Creosoted Timber vs. Concrete Bridges and Trestles

A.R.E.A. Discussion at Chicago Brings Out Points Favoring the Cheaper Construction

At the recent meeting of the American Railway Engineering Association the discussion on the report of the committee on wooden bridges and trestles emphasized some of the economic features of the use of creosoted bridge timbers and trestles as compared with concrete structures. An abstract of the committee's report was printed in the issue of the ELECTRIC RAILWAY JOURNAL for March 24, page 549. The committee favored the former except when the cost of the concrete structure is less than one and one-half times that of a creosoted wood structure for the same location. One of the hazards of the timber structure which the committee pointed out was the danger from fire, and several men told of their experiences in this connection. None had had any trouble from fire caused from dropping coals and cinders. One railway man said he had more than 300,000 lineal feet of ballast-deck creosoted-timber structures on his line and had never in the history of the road had more than five burn out. Nevertheless this hazard was a possibility which the committee weighed heavily against the wood structure.

A consideration which was of importance to Southern railroads was the fact that the large amount of drainage work being done through the South was lowering the drainage level and making it possible partly to fill in a number of trestles which it had been previously necessary to keep entirely open. Thus it seemed not wholly advisable to spend $33 a foot for concrete or permanent trestle over drainage ways which might in the course of five or six years be safely filled in at least in part. With the temporary wood structure it was more likely that the creosoted stringers could be recovered than could the concrete slab of a permanent structure, and the loss would thereby be much less.

Another item in favor of the temporary structure in this district was the fact that many of the valleys are filling in with sand so that about every ten years it becomes necessary to lift the entire roadbed in order to keep it above the water level. The railway man citing this experience said that it would be distinctly a mistake to build permanent structures where conditions were changing in this manner, for with the concrete structure which could not be raised with the change in water level there would naturally be a greater risk of loss. Some of these sand fills, he said, appear very suddenly at times.

As against the wooden structure and favoring the permanent concrete structure, it was brought out that many things develop in connection with the creosoted timber which introduced a cost in taking care of it, such as cleaning out the vegetable growth beneath the structure, more frequent inspection, etc. These items the committee had apparently not included in their conclusions.

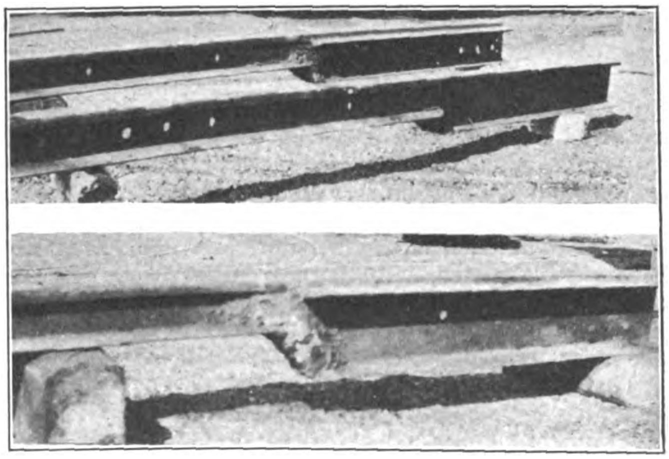
Inasmuch as the committee, in arriving at a definite ratio of economic advantage in the one type of construction over another, had assumed certain figures in the relative life of the two kinds of construction and had made other necessary assumptions which were not brought out in great detail in the report, the association voted to refer this recommendation back to the committee for further consideration.

Compromise Joints Improved by Arc Welding

BY JOSEPH McPHEE

Roadmaster Richmond Light & Railroad Company,
New Brighton, N. Y.

There are a number of locations on our system where sections of T-rail join sections of girder rail. The occurrence of bad and broken joints at these places have been eliminated by making arc-welded compromise joints such as shown in the accompanying illustration. An Indianapolis welder is used, and care is taken to get a good body of welding steel where the rail ends are joined together. After the welding is completed the heads of the rails are ground to a smooth surface.



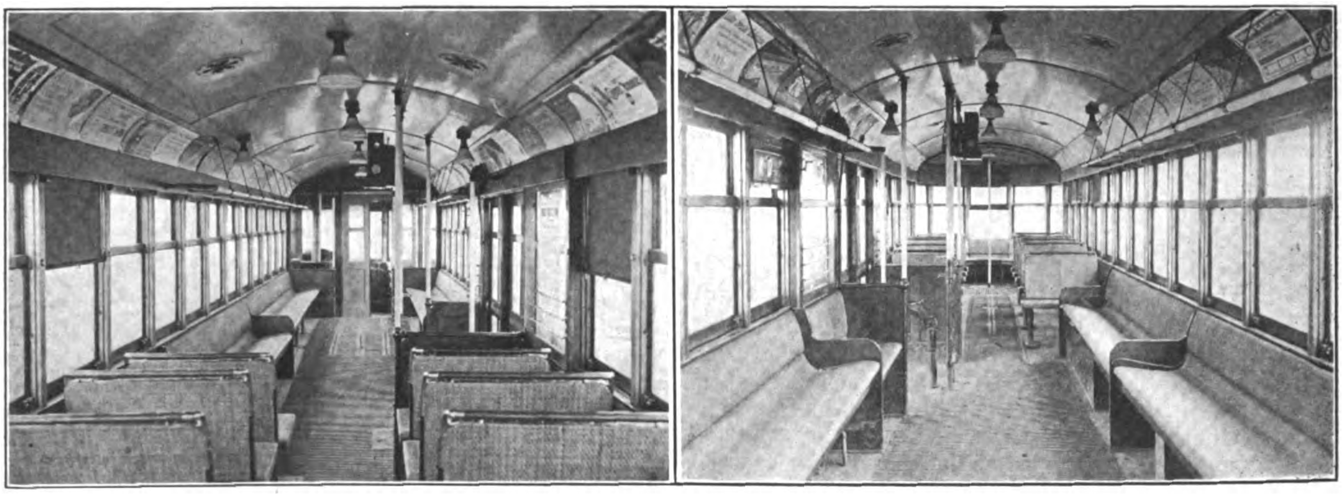
COMPROMISE TRACK JOINTS MADE BY ARC WELDING

The cost of making a welded compromise joint between a Lorain T-rail section No. 47 and a Lorain girder rail section No. 84 is approximately $8, which includes the cost of the welding steel. Several of these joints have been in service for more than two years and are still satisfactory in every respect.

New Interior Views of Toledo Center-Exit Cars

The accompanying views of the interior of one of the sixty front-entrance, center-exit cars, which are giving excellent service in Toledo were recently taken for the ELECTRIC RAILWAY JOURNAL through the courtesy of H. H. Ross, chief engineer. As was explained in articles which appeared in the issue of this paper for Oct. 7, 1916, pages 723 and 738, the interesting feature of these cars is the provision for train control, this being the first attempt at multiple-unit operation with cars of the type designated by the inventor, Peter Witt, as the "Car Rider's Car."

The decision to operate these units was arrived at after experiments had been made with trains in handling crowds from the factories and from the downtown districts of the city during rush hours. Multiple-unit operation, however, was preferred to trailer operation because it was estimated, after studying the traffic, that out of a working day of sixteen hours there would be only about six hours during which two-car trains could be advantageously operated. With motor cars and trailers, therefore, half of the new cars would be idle for ten hours out of the sixteen. Also during this time the remaining new cars would be handicapped in weight and power consumption by the extra capacity of the motors required to haul trailers during the rush hour. With two-motor multiple-unit cars, however, all of the new cars could be kept in service during the entire day, working part of the time as two- or three-car trains and the remainder as single-motor cars. This arrangement, it is expected, will release from service during the non-rush hours a corresponding number of older and heavier cars which are more expensive to operate than the new ones and will thus effect material economies.



INTERIOR VIEWS OF THE FRONT-ENTRANCE, CENTER-EXIT CAR NOW IN USE IN TRAIN OPERATION IN TOLEDO, OHIO

The new cars are designed for single-end operation and they are equipped with two Westinghouse 40-hp. field-control motors and light-weight HL control. Busline receptacles are employed and a train of two or three cars can thus be operated from a single trolley. The principal dimensions of the car provide for a 50-ft. over-all length, a width over side plates of 8 ft. 2 in. and a weight complete of 35,000 lb. The diameter of wheels is 26 in. The seating capacity is fifty-six.

The use of an indirect type of control was adopted not only because of the opportunity that it gave for multiple-unit operation, but also because it enabled all of the main circuits and circuit breaking devices to be located beneath the floor. In this particular instance the control has been supplemented by interlocking the control circuit through contact from the doors so that a car or a train cannot be started until all of the doors in the train are closed. The same arrangement is utilized also to operate a motorman's signal light which is used in place of the customary bell signal.

Car Curtains Renovated and Dyed to Restore Appearance

Method Described and Chemical Formula Given Whereby Curtains May Be Cleaned for About Eighteen Cents

BY WILLIAM A. COLBURN
Master Painter, Auburn & Syracuse Electric Railroad, Auburn, N. Y.

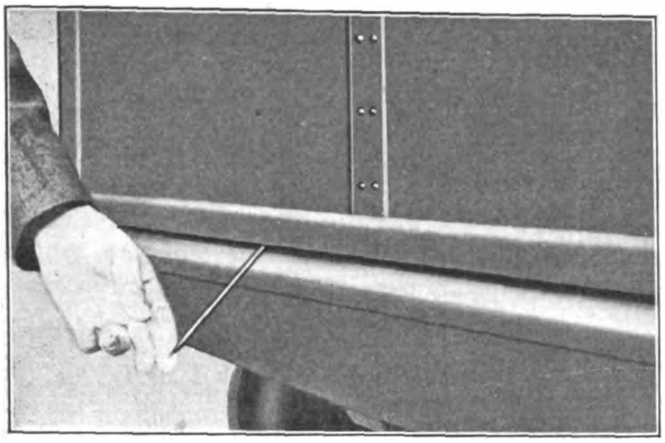
Very frequently car curtains, after being in use for some time, become soiled and faded, and often stained from water. The writer has successfully used a method of renovating curtains composed of fabric with leather ends.

The curtains are first removed and thoroughly whipped, after which they receive a gasoline bath. All water stains are then washed out with soap and water and the curtains are drawn through a vat containing the following mixture, sufficient for the curtains of one ordinary interurban car: 12½ lb. deep chrome green, or any other color desired, in oil; ¾ gal. turpentine; 1 pt. Japan dryer; 1 lb. drop black, in oil; and ¾ gal. raw linseed oil.

The vat is made of sheet iron, with a length 4 in. greater than the width of the curtain, a width of about 10 in., and a depth of about 4 in. The curtain is held by the two ends and the middle is drawn backward and forward through the solution.

After the curtain is thoroughly saturated it is held up edgeways for about two minutes to drain. It is then laid over a bench and brushed thoroughly while the fabric is still wet. This operation raises the nap of the cloth, as well as kills the effects of the linseed oil which would otherwise leave the cloth stiff. The curtain is then hung up with the roller end down for stretching and is allowed to dry for twenty-four hours to avoid the danger of spontaneous combustion. The cost of this process is about 18 cents per curtain.

Curtains made up of leather on one side and fabric on the other are not dipped, the paint being brushed into the fabric while it is laid flat on a bench. The cost of this process is about 13 cents per curtain.



SLOT FOR DRAINING SASH POCKETS

Drainage of Sash Pockets by Slot Above Side Sills

The Memphis (Tenn.) Street Railway has among its older types of cars fifteen of the straight side construction type with sash pockets that formerly had no bottom outlet.

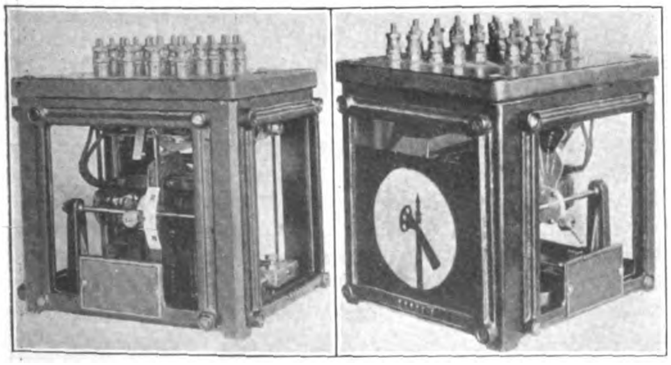
The accompanying illustration shows how drainage and ventilation have been provided at the bottom of the sides of this car by means of a special construction designed under the guidance of A. D. McWhorter, superintendent of equipment and overhead lines. A slot was first cut the full length the side of the car. The outside top corner of the sill was then chamfered off between the posts. After the wood had been thoroughly white-leaded it was shielded with sheet iron lapped over the outside of the sill and laid against the interior lining of the car. In this way this open slot leads directly to the window pockets, and any dirt or water immediately passes out of the slot.

This method of providing drainage and ventilation was installed only after the more simple method of boring holes had been found ineffective due to the stoppage of the holes with refuse.

New Types of Railway Signal Apparatus

The Union Switch & Signal Company, Swissvale, Pa., has developed several new types of relays which make use of their standard Model 15 vane construction.

One of these is the switch point indicating relay shown on the left side in the accompanying illustrations. In this instrument a pointer mounted on the shaft moves over a white enameled scale which is marked to designate the normal, reverse and de-energized positions of the relay. These positions correspond to the normal, reverse and intermediate positions of the switch points.



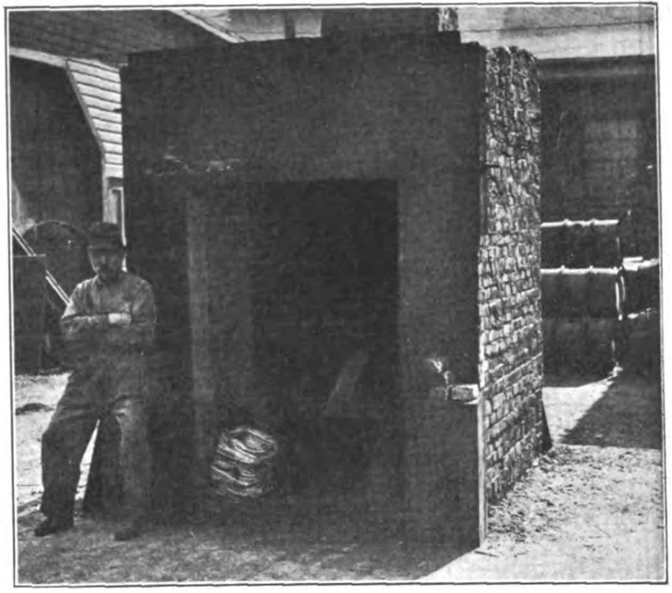
SWITCH POINT INDICATING RELAY AND TOWER-INDICATOR RELAY OF SEMAPHORE TYPE

Another type of the two-position Model 15 relay incorporates a tower-indicator attachment, thus providing a tower indicator with the functions and refinements of a standard relay. It can be furnished as a single or double element, line or track relay. The indicator can be of either the semaphore type which is shown on the right side of the illustrations or the disk type.

The same company has also developed an alternating current crossing warning bell of the electromagnet type. In size and general features it is identical with their direct current crossing bell, the operating mechanisms of the two being interchangeable. An adjustment is provided by which the frequency and the intensity of the strokes can be varied through a wide range.

Furnace for Burning Insulation from Copper Wire

The brick furnace shown in the accompanying illustration is used by the International Railway, Buffalo, N. Y., for burning the insulation from old wire. It consists of a brick chamber, lined with fire brick, about 4½ ft. deep x 5 ft. wide x 7 ft. high, inside dimensions. A brick chimney on the rear projecting about 8 ft. above the roof furnishes the necessary draft.



FURNACE FOR BURNING INSULATION FROM OLD WIRE

A grate is located about 18 in. above the floor, made up of sections of ordinary boiler grate resting upon iron bars attached to the side walls. A sheet-iron door is provided to cover the front opening from the top down to the grate level.

The furnace is charged with field coils, armature coils, line wire, etc., by inserting the grate in sections as required. This method of charging permits the wire to be handled readily. When the furnace is fully charged, its contents are covered with kerosene, the sheet-iron door is put into place and the charge is ignited. The copper is removed perfectly clean, almost as if dipped in an acid bath.

A furnace of this kind provides a convenient place for storing scrap copper wire while a charge is accumulating. It can be built in an out-of-the-way corner of any shop grounds at a very moderate cost.

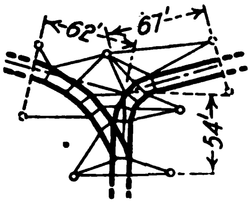
Cost of Erecting Overhead Work—VI

(From the records of a large Eastern company)

The following is the sixth group of a series of diagrams with figures to show the actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. The preceding groups of this series were published in the issues for Jan. 20, page 127; Jan. 27, page 173; Feb. 10, page 260; Feb. 24, page 355; and March 10, page 447.

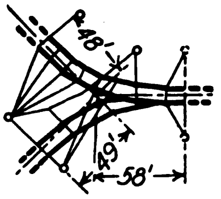
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Double track "Y" branch-off, angle 150 deg.



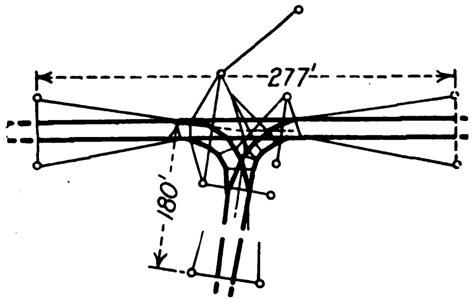
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Truckig	Labor	Trucking
40*	$45.38	$33.00	$54.45	$39.60	$63.53	$46.20

Double track "Y" branch-off, angle 90 deg.



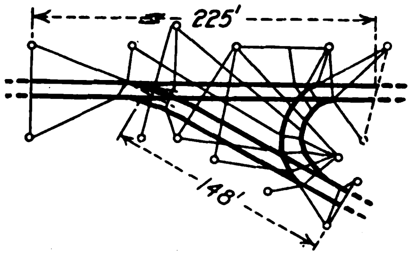
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
41	$35.09	$14.52	$41.47	$17.16	$47.85	$19.80

Double track three-part "Y", angle 180 deg.



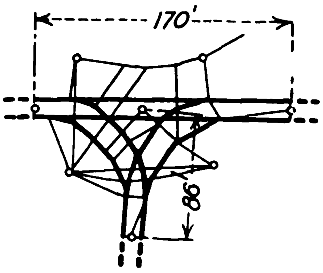
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
42*	$54.45	$39.60	$63.53	$46.20	$72.60	$52.80

Double track right hand branch-off with double track connecting loop angle 30 deg.



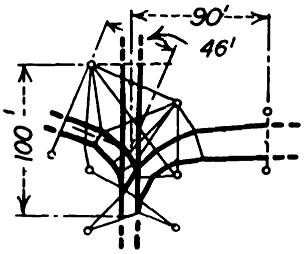
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
43*	$54.45	$39.60	$63.53	$46.20	$72.60	$52.80

Double track three-part "Y"



No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
44*	$54.45	$39.60	$63.53	$46.20	$72.60	$52.80

Double track through "Y", angle 180 deg.



No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
45*	$54.45	$39.60	$63.53	$46.20	$72.60	$52.80

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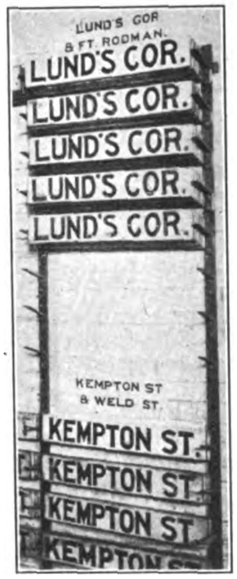
*Trucking includes cost of extra reel truck. None of the figures on this page includes cost of superintendence and engineering.

Compact Sign Rack at New Bedford

A simple but very compact sign rack is in use at the Weld Street carhouse of the Union Street Railway, New Bedford, Mass. As shown in the illustration, it consists of sections of strap iron and angles bolted to the carhouse wall, each pair of angles forming a skeleton shelf holding a half dozen signs. In a wall space of about 12 ft. x 7 ft. approximately 300 signs can be stored for immediate withdrawal for service. The uprights are of 1½-in. x ½-in. iron with sign supports 5 in. long, 1 in. wide and ¼ in. thick, spaced 6 in. apart. The brackets are slightly inclined from the horizontal, thereby holding the signs in place by gravity. Labels painted on the wall denote the different sections and also aid in the rapid selection of a sign.



INCLINED BRACKETS HOLD SIGNS BY GRAVITY

Reduction of Clinker Trouble

Selection of Suitable Furnace Lining, Good Quality of Coal and Proper Handling of Fire Are Essential

In a discussion on the causes and remedies of clinker trouble in boiler furnaces Albert A. Cary, consulting engineer, New York City, called attention to many interesting facts of which the following is an abstract. Clinkers are formed by the fusion of the ash and refuse which remains after the combustion of the coal in the furnace. Where shaking bars are used it is quite essential that the thickness of the ash bed should always be reduced before any attempt is made to break up the fire bed above, otherwise the ash will be thrown up into the bed of fuel and fused into clinker. Too thin fires, carried on the grates, should be avoided, especially with shaking grates, as every fire bed should be of sufficient thickness to allow a proper depth of ash to be carried on the bars to protect them from the intense heat of the burning fuel above them. Excepting these very thin fire beds, it may be said that the intensity of draft required to operate a furnace is, generally speaking, a measure of its clinker-making properties, which is another way of saying that the intensity of the draft required is a measure of the density of the fire bed.

The underfeed type of stoker, in its method of working, simply defies all theories for the reduction of clinker troubles. Very few grades of coal produce ash which will not become fused into more or less of a clinker under the conditions of treatment found in the underfeed stoker. It therefore becomes necessary, where this type of stoker is used, to select a coal which does not run too high in its percentage of ash, and the ash must have the highest fusing temperature possible. By the method of feeding used in this type of stoker, the coal is compactly forced into a more or less condensed mass of burning fuel, which demands the use of heavy forced blast fans, and in order to reduce the amount of clinkering which occurs the operator must use every possible means to keep his fuel bed open and porous. Otherwise the air for combustion will seek every easy passage for escape, and work its way through cracks and holes in the fuel bed, instead of being more uniformly distributed throughout the mass of hot fuel.

This form of stoker has permitted the feeding of more coal per unit of grate area than its predecessors, and this valuable feature largely offsets its clinkering troubles, as the demand of to-day is for a stoker that will burn coal, and lots of it when required, to carry the plant over its troublesome peak loads.

Side walls with this type of stoker should be kept free from accumulations of ash or clinker at very frequent intervals and before the clinker is allowed to cool and harden. By a careful selection of the coal and refractory lining for the furnace the worst effects of clinker trouble can be considerably reduced.

The selection of refractory material for lining furnaces is a matter which has received altogether too little attention by power-plant owners. The common practice of using the same quality of fire-brick for all parts of the furnace is certainly a mistake. The sidewall lining of a furnace should be selected with the use to which it is subjected kept in mind. It is true that these side walls are subjected to the effect of high temperatures, but if the most refractory bricks that can be bought are used for this position, it will be found that they will not stand the severe abrasion to which they are subjected, such as result from the use of the poker, the clinker bar, etc., to free them from the adhering clinker. It is most important to consider the fluxing effect on these bricks from the ash produced from the particular kind of coal used.

The fire-clay brick is now used in nearly all boiler settings, and it is probably the best brick adapted to sudden changes of temperatures, due to its more or less porous structure. The fine-ground, hard-burned brick usually gives the best linings for side walls, while the coarser and more open or porous bricks are better adapted for fire arches. Accumulation of ash or any incipient formation of clinkers on the side walls or bridge walls of the furnace must be promptly removed if destruction of the walls is to be avoided.

The other class of inclined grate stokers have their fuel fed from coal magazines placed in each side wall. At the bottom of the V, formed where the two sets of inclined grates from each side wall come together, there is provided a set of clinker bars which are supposed to remove the ash and clinker automatically as soon as they reach this position, but there is always an accumulation of incandescent ash, clinker and some small amount of fuel at the bottom of this trough. This builds up especially in the presence of large clinkers formed in the fire bed, and where this lower part of the fuel bed comes in contact with the end walls there is a tendency to build up clinker or erode.

In the chain-grate type of stokers with a very slow motion of the burning fuel on the grates, there is a tendency, with certain coals, for fusion of the ash to take place, and when this comes in contact with the side walls, due to the slow rate of travel, clinkering often occurs there. Such trouble is increased when the movement of the grate is stopped for considerable periods of time. Efforts have been made to reduce the destructive action to side walls in furnaces, where this type of stoker was used, by substituting metal faces in the furnace walls to replace the fire-brick lining, back of which faces a water circulation was maintained. Besides the clinker or erosive troubles in stokers of this type, there is added the abrasion caused by the constant rubbing of the fuel bed against the side walls. Notwithstanding the occurrence of such troubles in certain plants using this type of stoker, there are many hundreds in use where fire-brick linings are used in their furnaces, and it is claimed that the cost of repairs for these linings is not excessive, and that it is no higher than in other stokers doing similar service.

News of Electric Railways

Traffic and Transportation
Financial and Corporate
Personal Mention
Construction News

New Albany Storm Damage

Damage to Railway Lines Very Slight—Service Rendered Quickly by Them to the General Public

Comparatively little damage was suffered by the street railway system, in New Albany, Ind., by the tornado which skirted the northern and western extremities of the city on the afternoon of March 23. Altogether, according to W. L. Foreman, trainmaster of the Louisville & Northern Railway & Lighting Company and the Louisville & Southern Indiana Traction Company, about 2 miles of overhead construction was destroyed. It chanced that this fell on two ends of the State and Vincennes Street line, which terminates at each end in the storm devastated area. A portion of the Vincennes Street carhouse was unroofed and a corner of the wall blown down. Between New Albany and Jeffersonville, the interurban line of the Louisville & Northern Railway & Lighting Company was put out of commission for a time by wire trouble, but this damage was speedily repaired and service continued. There was no interruption on the direct Louisville & Northern line to Louisville via the Kentucky & Indiana Bridge. No cars were damaged.

All Power Shut Off

Power was shut off from all lines immediately after the storm broke, so as to eliminate danger of damage from live wires. All wire systems in the storm area were twisted into tangled masses. Mr. Foreman immediately sent crews out to patrol the lines not seriously affected and to cut the wires on the line affected at Cherry Street on one end and Charter Street at the other. On the following morning full service was resumed, except over the 2 miles of line in the devastated area.

After ascertaining that there was no chance of further direct damage by the storm, the United Gas & Electric Company and the two companies mentioned previously gave their attention to the needs of their own employees and their families. Fourteen of the railway men had homes in the area affected. Some of them lost relatives in the total of thirty-seven deaths.

The repair forces of the companies served to take care of immediate requirements to the system. Some trolley wire was obtained from the Louisville Railway, but outside of that no aid was needed. Salvage of the wire system material will be slight. Permanent repairs will be made as soon as the members of the National Guard, who were rushed to service in the emergency, are removed and the storm district opened again.

The force of the storm was spent 1 mile from the river front where the principal improvements of the steam railroads are concentrated. The total property damage is estimated up to $1,500,000.

Across the river, service was interrupted on the Prospect line of the Louisville & Interurban line railway, but the damage to that property was slight.

Traffic Demand Great

An interesting feature for several days following the storm was the heavy demand on the Louisville & Northern and the Louisville & Southern Interurban lines, reaching from New Albany to Louisville. Sightseers and relief workers taxed the capacity of the company's lines from the outset and on the half holiday on Saturday, March 24, and on the Sunday following, people stormed the cars for accommodations. Every piece of rolling stock that the electric railways had available was pressed into service. Free carriage was provided for relief supplies from Louisville.

New Force in Washington

Company Rebuilding Its Car Personnel—Violence by Strike Sympathizers—Terms of Individual Contract

The drive being made by the Washington Railway & Electric Company, Washington, D. C., against its former employees and members of the Amalgamated Association now on strike is having a telling effect. An entirely new force carefully selected with a view to permanent employment by the company has been engaged and is fast becoming acquainted with the requirements of service in Washington.

The strikers and other sympathizers, realizing that the strike is lost, are resorting to desperate tactics, which indicate the collapse of whatever defense they may have had. Among the first of the threatened acts of reprisal on the company was the talk of boycott mentioned in the Electric Railway Journal for March 24. The company met this issue squarely by announcing that it proposed to appeal to the courts for protection of its rights.

In the last few days threats made previously of damage to the company's property were actually carried out. On March 27, after overpowering the crew of a car, the perpetrators of disorder turned on the current and the car ran wild on the public streets until derailed. This act was the logical sequence of inflammatory talk and speeches. It had the effect, however, of strengthening the determination of the company to have nothing to do with the Amalgamated Association. In fact, the company promptly offered a reward of $1,000 for information which would result in the arrest and conviction of the person or persons responsible for the attack on the crew and the destruction of the car.

The company is resting its case with the public on the basis of service offered. and within the last few days has gone directly to the public with announcements only in the matter of the reward offered for the apprehension of the perpetrators of the wreck previously mentioned, and where statements emanating from union headquarters have so grossly misrepresented the facts or the company's position that it felt the statements should not be allowed to go uncontradicted.

Contents of Individual Contracts

The individual agreement made between the company and each of its men contains eight clauses. The first specifies the rates of pay and provides that in addition all car service men shall be entitled to their share of any bonus or profit-sharing plan which the company may adopt. In the second the man agrees to abide by the rules of the company as they are now or may from time to time be established, that the business of the company shall be conducted on the open-shop principle, that the present practice in assigning runs will be continued and that the hours shall be as specified.

The third clause provides that any grievances will be taken up with the management on the second or fourth Tuesday of each month at the office of the superintendent, that a man may appeal from the decision of the superintendent to the president and that the Public Utilities Commission of the District shall be the final arbitrator. The fourth provision is to the effect that the commission may decide the conditions under which its decisions shall take effect and to whom they shall apply, that either party may apply for a modification or review of such decision and that the decision of the commission shall be in harmony with the express terms and provisions of the contract. Clause 5 provides for hearings in the same way for any man discharged, with final appeal to the Public Utilities Commission.

Under the sixth clause the men agree not to strike or to hamper or obstruct the company in the discharge of its duties as a common carrier, and if they wish to leave the service of the company they will do so peaceably, singly and without confederation, and the company agrees on its part that it will not declare a lockout or cease operation or to refuse to employ and keep in its employ a force of suitable and competent men who are willing to abide by the terms of the agreement and that it will not discharge men without cause.

The seventh clause provides that any presentation of agreements or arbitration under contracts shall proceed only in the name of and under the direct charge of the complaining employee or employees or committee thereof. Clause 8 provides that the contract shall be for three years.

The contract is about 1500 words in length, and space is provided in it for the signature of the trainman and for the signature of the president of the company.

Toledo Negotiations Resumed

Negotiations between the Street Railway Commission of Toledo, Ohio, and Henry L. Doherty of the Toledo Railways & Light Company, over the franchise, were resumed during the week ended March 24. Forfeiture clauses in the proposed community plan were first discussed in detail. Mr. Doherty declared two of them so drastic that he could under no circumstances accept them.

A number of details were agreed upon. The rate of cash fare was also discussed. Mr. Doherty holds that this should be 5 cents, since it is paid almost entirely by transients. He also objected to firemen and policemen riding free. It was finally agreed to leave this matter in the hands of the city.

On March 21 considerable time was spent in discussion of the proper manner of arriving at the value of the plant when the city is prepared to purchase the property. Commissioner Johnson Thurston insisted that it should be valued on the basis of actual cost, plus the cost of repairs and minus depreciation. Mr. Doherty, however, argued that the market value at the time should govern the price paid. He suggested that the other commissioners, who were absent, consider this point before further discussion of it.

On March 22 Mr. Doherty suggested that the people would be more willing to agree to a fair settlement if the fare was advanced now. He also expressed doubt as to the wisdom of the course that has been taken in endeavoring to compromise the franchise matter.

At a meeting with Councilmen and other city officials in Mayor Milroy's office on March 22, Mr. Doherty refused to bind the company to pave between its tracks on an unlimited number of streets, where the city wishes to make improvements, subject to the discretion of Council. He did, however, propose to pave this space on a list of streets submitted by Service Director Goodwillie, on a five-year basis, provided Council would agree not to order the removal of the company's tracks from Huron and other streets.

Agreement on Franchise

An agreement was reached on March 22 between Mayor Minshall of East Cleveland, Ohio, and the Cleveland Railway on the terms of a new franchise which will go into effect on the approval of the East Cleveland Council, unless a referendum vote is demanded. It is to cover a period of twenty-five years, and provides for a cash fare of 5 cents, with free transfers to any part of the city of Cleveland, and six tickets for 25 cents, with free transfers on crosstown lines in the suburb, and a cent charge for transfers on Cleveland crosstown lines. The company agrees to extend the Superior Avenue line from 123d Street to Euclid Avenue, and build a crosstown line in the suburb between Euclid Avenue and St. Clair Avenue, the route to be selected later. The agreement also provides for the kind of service which is to be furnished for East Cleveland patrons. Mayor Minshall insisted for some time upon a straight 3-cent fare for rides within the city of East Cleveland. Fielder Sanders, street railway commissioner of Cleveland, asserts that the company has been losing $250 or more a day on the East Cleveland business. Mr. Sanders will prepare a draft of the proposed franchise.

Dishonest Conductors Apprehended

Men Who Operated in Atlantic City and Other Places Under Indictment

Guy Brinsfield, under indictment for conspiracy to defraud the Atlantic City & Shore Railroad, Atlantic City, N. J., for which he worked as a conductor last summer, was caught in Maryland on March 25. Brinsfield was locked up in the county jail pending disposition of his case in the Quarter Sessions Court. Brinsfield and William G. Gilbert secured employment in Atlantic City last summer as conductors, representing themselves to be brothers and giving their names as George and William Maddox. In applying for work they gave as reference the names of Paul Osier and William J. Windsor. Letters about their standing, written to addresses furnished by the men, came back to the company containing high recommendations for the pair. Windsor, in one of the references, was represented to be cashier of a national bank in Oldgrove, Del., but subsequent inquiry revealed that there was no such institution there. Both Osier and Windsor were indicted with Brinsfield and Gilbert. The latter was arrested following the revelation that fares were being withheld from the company. He is under bonds for trial. Brinsfield was located in Bridgeport, Conn., but eluded arrest at the time, although Windsor was apprehended in the same city at the time as noted in the ELECTRIC RAILWAY JOURNAL of Feb. 24, page 360.

Bus Extensions Recommended

Extension of motor-bus lines in New York City is recommended in a report submitted by the committee on franchises to the Board of Estimate on March 22. The report says that a comprehensive motor-bus system at the rates of fare now proposed will not injuriously affect the earnings of the existing or proposed transportation facilities. such as the dual subways in which the city is interested.

The committee has also considered bids submitted by the Fifth Avenue Coach Company and the New York Motor Bus Company, Inc., and has concluded that new offers should be requested from these companies upon routes which have to some extent been amended since the hearings. The report ends with the statement that the committee is about to ask for new offers from the companies, and will present another report to the Board of Estimate as soon as a satisfactory contract has been submitted.

New "Seven Sisters" Law

Governor Edge of New Jersey on March 29 signed two Senate bills amending the "Seven Sisters" anti-trust laws. passed during the administration of President Wilson as Governor of New Jersey, making them conform to the federal Clayton act. Under the amended laws New Jersey corporations may acquire stock in other corporations.

Suppressing Reckless Autoists

Trainmen of the Bay State Street Railway Are to Report Careless Automobilists

The Bay State Street Railway Company, Boston, Mass., has issued instructions to car service men to report to their division superintendents the license number of any automobile which passes a standing car in such a manner as to jeopardize the safety of the passengers. These numbers will be reported by the company to the Massachusetts Highway Commission, which has jurisdiction over all automobiles registered in the State, so that in the event of a report an admonition will be issued. More severe measures will be taken by the commission upon receipt of a second report on the same automobile. The Massachusetts statute provides that in approaching a standing street car which has been stopped to enable passengers to alight or to embark, the operator of every motor vehicle shall slow down and, if necessary for the safety of the public, bring the vehicle to a full stop. Through the co-operation of the board, the company hopes to reduce the number of accidents due to failure to observe the above regulation.

Brotherhood for Denver Tramway

Expansion of the Former Mutual Aid Association—Benefit Features for Its Members

It has been decided to enlarge the Tramway Mutual Aid Association of the Denver (Col.) Tramway employees by organizing a brotherhood known as The Tramway Brotherhood of Denver, Col. The principle underlying this organization is mutual co-operation among the employees and the officials and management of the Denver Tramway and affiliated companies. All the employees of the company, numbering about 1400, will constitute the membership of the brotherhood. According to the preamble of the organization, it is based on the belief on the part of the employees that they are capable of managing their own interests without affiliation with any outside organization. Its objects are: to provide death benefits and give relief to its members in case of disability, to promote good fellowship among the members and secure possible business benefits by cooperating with the company officials, and to aid in the education of the members in things concerning railway operation and thus make the business mutually advantageous to the brotherhood and to the company.

The management consists of a board of trustees of nine persons. The general manager of the Denver Tramway is president of the brotherhood and the auditor of the company is treasurer. The president and treasurer, together with seven members of the brotherhood, selected from the mechanical, engineering and power departments, and the four divisions of the transportation department, constitute the members of the board. The members are divided into three classes, according to their average monthly earnings, and the dues per month are 50 cents, 75 cents and $1 for the respective classes. The weekly indemnities in case of total disability are $5, $7.50 and $10 and the death benefits for the different classes are $500, $750 and $1,000.

The company pays from its own treasury all death benefits up to the amount required by the American experience table of mortality, expenses of management and for the litigation and adjustment of death claims, and also agrees to loan to the brotherhood without interest for a year any deficits which may occur in its funds.

Philadelphia Proposal Criticized

City Transit Director Urged That Construction Be Limited at Present—Fare Increase May Be Necessary

An analysis by W. S. Twining, transit director of the city of Philadelphia, of the proposal submitted to the city by the Philadelphia Rapid Transit Company for the lease and operation of the city-built high-speed lines was transmitted to the Council by the Mayor at a special session on March 29 called for its reception and also for action upon the ordinance providing for the construction of a subway in Chestnut Street. Mr. Twining said in a letter which prefaced his report that the study by his department of the company's proposal showed it to be wrong in principle, unfair and costly to the city and faulty in detail. He said that, shorn of technicalities, the proposal aimed not to lease the city's property to the company, but to lease the company's property to the city at a fixed rental of $1,500,000 a year, the company remaining in charge of operation without a proper degree of responsibility.

The objections of Mr. Twining to the company's proposal are summarized in twenty-three separate paragraphs. The director added to his objections and recommendations a summary of the transit situation in which he discussed at length the question of fares. He asserted it must be evident that the authorized and established rate of fare would not meet the demands of the present system and carry the city's construction as well. In conclusion he recommended that the program of immediate construction of rapid transit lines be cut as nearly as practicable to the amount of the appropriation; that the construction of such portions of the proposed lines as would not interfere with the value of the rapid transit system to be deferred until a period of lower prices; that such part as practicable of the abnormal increases of taxes on real estate caused by rapid transit development be devoted to the payment of fixed charges on the city's investment in rapid transit, and that if there should still remain a deficit in the payment of the city's interest and sinking fund charges on the cost of construction the fare should be increased in order to make the undertaking self-supporting; first, by a charge for transfers between high-speed and surface lines; or, second, if this were not sufficient, by charging 6 cents on the high-speed lines with a 5-cent fare on the surface lines, or by charging a uniform 6-cent fare on both the high-speed and the surface lines.

Electric Line to Open in May.—May 15 has been fixed tentatively as the date for the Southern Pacific Railway to begin electric train service from Whiteson, 42 miles to Corvallis, thus completing the electrification of the West Side line from Portland, Ore.

Car Purchase Referred to Committee.—At the regular meeting of the City Council of Cleveland, Ohio, on March 19, Councilman Reynolds' resolution authorizing the Cleveland Railway to purchase 100 new motor cars and 100 trail cars was referred to the committee on street railways.

Toledo Plant Guarded.—The Toledo Railways & Light Company, Toledo, Ohio, is flooding its river front plant with light every night and guards patrol the space about it as a precautionary measure to prevent any possible attempt at injury to the plant by sympathizers with any of the belligerents in the war.

Fire Destroys Hagerstown Carhouse.—Fire destroyed the carhouse of the Hagerstown & Frederick Railway recently, along with nine cars and a quantity of freight, entailing a loss of nearly $100,000. The loss was covered by insurance and steps will be taken immediately looking to the rebuilding of the structure.

Bill Legalizing Utility Bonds for Savings Bank Unlikely to Pass.—The efforts are regarded as very unlikely to succeed which have been made to secure the passage of a bill in the New York Assembly, legalizing for the investment of funds of savings banks in public utility bonds that meet certain requirements.

Tulsa Reaches 50,000.—Under the franchise granted by the city of Tulsa to the Tulsa Street Railway when Tulsa attains a population of 50,000 the company is to pay to the city 2 per cent of its gross revenue. Tulsa now claims a population of more than 50,000, and a special census has been asked of the government.

New Pay System.—The Louisville & Southern Indiana Traction Company, New Albany, Ind., has put into effect the plan of paying off through depositing wages in a bank to the credit of the employees. By this plan a great deal of labor is saved for the office force, the memorandum of amounts due being merely handed to the bank, which credits each employee accordingly.

Employees Refuse to Sign Wage Agreement.—On March 22 it was announced that employees of the local line of the Cincinnati, Dayton & Toledo Traction Company at Hamilton, Ohio, had refused to sign the new wage agreement, because of some further differences that have arisen. Split runs are causing trouble and there has been a misunderstanding in regard to pay for overtime.

Mutual Welfare Association for Employees.—The employees of the Manhattan & Queens Traction Corporation, New York, N. Y., have organized a mutual welfare association which affords its members sick benefits, death benefits to the extent of $500 and special hospital fees. An association physician is provided and any member who leaves the employ of the company may continue in good standing, receiving all benefits with the exception of the death benefit.

New Jersey Commissioners to Designate Train Crews.—By the signing of a bill repealing the full crew railroad law heretofore operative in New Jersey, by Governor Edge, the Board of Public Utility Commissioners, effective on July 1, will prescribe the necessary train crews for railroads in the State. It is intended that the board shall hold hearings before taking action in the different classes of operation before rendering decisions as to the number of trainmen necessary to comprise respective train crews.

Cleveland Track Renewal Reduced.—At the meeting of the City Council of Cleveland, Ohio, on the evening of March 26, the Cleveland Railway was authorized to spend $517,000 in the renewal of tracks on twelve streets, instead of the $1,273,000, which the company had asked to spend. In addition, renewals can be made on nine other streets with funds that were to have been used last year, amounting to $458,000. Only a small part of the program arranged for last year was carried out. The renewals granted are for the most part on streets which are to be repaved.

Third-Tracking the New York "L."—The Interborough Rapid Transit Company, New York, N. Y., has issued "How a Twenty-Million Dollar Railroad Was Built in Mid-Air," a twenty-eight page booklet 6 in. x 8 in., describing and illustrating the third-tracking of the New York elevated lines. The contract for the third-tracking was let on Feb. 13, 1914, the work was begun thirty days later and was finished by Jan. 1, 1916, and on Jan. 17, 1916, the new express service was begun. The longest single interruption to traffic while the work was in progress was twenty minutes.

Increase in Wages on Missouri Short Line.—The Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., the Missouri Short Line, has announced a new wage scale, as a result of the response of the trainmen to programs of safety efficiency. Heretofore the scale has been as follows: first six months, 26 cents; second six months, 26½ cents; second year, 27 cents; third year and thereafter, 28 cents. The new scale is as follows: first six months, 26 cents; second six months, 27 cents; second year, 27½ cents; third year, 28½ cents; fourth year, 29 cents; fifth year, 29½ cents; sixth year and thereafter, 30 cents.

Paving Requirement to Be Imposed.—The City Commission of Dallas, Tex., has announced that it will order the repaving of Jefferson Avenue from Lancaster Avenue to the city limits, requiring the consolidated company that takes over the lines of all the companies in the city to pave between its tracks. It is estimated that the total cost of the paving will be about $500,000, and that the company will have to pay about $200,000 of this. This sum will be deducted from the amount required for improvements the first year under the service-at-cost franchise. The order will be issued as soon as the consolidation plan is worked out and this issue settled.

Technically Trained Men Urged for Public Positions.—D. A. Hegarty, president of the Texas Gas & Electric Company, Houston, Tex., in an address delivered recently before the engineering assembly of the Agricultural and Mechanical College at College Station, Tex., urged the employment of technically trained men for city, state or national positions of a technical nature. He cited examples of wastefulness in road, pavement and bridge construction supervised by men elected from other fields of endeavor, who were not capable of directing the work efficiently. Mr. Hegarty also said that sane regulation of privately owned enterprise meant the greatest efficiency and economy to the public.

Further Consideration of Norfolk Ordinances.—The proposed Virginia Railway & Power Company ordinances were discussed by the Aldermen of Norfolk, Va., on March 14, when the question of appropriating an additional $500 for the employment of an expert by the city came up. The Council had previously appropriated $600 for the purpose, but when it was found that an additional $500 would be required, the board reversed itself and declined to make the appropriation. It is stated now that the committee will take no further action until it has disposed of the resolution recently adopted instructing it to ask the Virginia Railway & Power Company if it is willing to submit or consider a proposition.

Increase for Youngstown Men.—Effective on April 1, the wages of the motormen and conductors employed by the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, will be automatically increased, according to the provisions of the wage scale agreed upon last year. Under the new scale the men will be paid as follows: 35 cents an hour for those in the service two years or longer; 32 cents an hour for those with the company one and two years; and 28 cents an hour for those employed less than one year. During the past year the men have worked under the following scale: 33½ cents an hour for those employed more than two years; 31 cents an hour for those working from one to two years, and 28 cents for the men employed less than one year.

Rhode Island Company Renews Its Plea.—Trustees of the Rhode Island Company, Providence, on March 22, in conference with Mayor Joseph H. Gainer, told him that there is a possibility of the company's holdings, most of which are leased, reverting back to the United Traction & Electric Company. Increasing operating costs and constantly advancing charges on the company's earnings by the city under the 1912 franchise, were cited as among the things that were gradually but steadily tending to embarrass the company. About a year ago the federal trustees appointed under the New Haven Railroad dissolution agreement appealed to the city for relief. Hearings were held on the matter, but no action has as yet been taken looking toward extending relief to the company.

Advertising Bill Opposed.—The International Railway, Buffalo, N. Y., through Porter Norton, of Norton, Penney, Spring & Moore, of counsel, is protesting against the enactment of the Marsh bill by the New York Legislature. The bill authorizes cities to tax billboards, signs and other public advertising mediums. At a hearing before the Assembly cities committee Mr. Norton declared that the company paid a tax to the city and to the State and that receipts from street car advertising entered into the gross revenues upon which the company was already taxed. He charged that the bill would mean a double tax and suggested that it be amended so that it would not apply to public service corporations subject to payment of a tax on special franchises or gross receipts.

New York Employees Return from Border.—T. P. Shonts, president of the Interborough Rapid Transit Company and the New York Railways, has announced that all the employees of the two companies who answered President Wilson's call last June, and who did National Guard duty on the Mexican border, have returned and resumed their former positions. While the men were away serving their country they were carried on full pay, and their places were kept open for them. The number of Interborough employees on duty varied from time to time, the greatest number at any one time being 149. The total amount in salaries or wages paid these men while in military service was $61,800. Seventy-six employees of the New York Railways did military duty on the border, and the total amount paid them by the company during their absence was $34,212.

Newport Ordinance Null and Void.—The initiated franchise ordinance, adopted by the voters of Newport, Ky., at the 1916 election, was held to be null and void by Circuit Judge Otto Wolff recently in overruling the demurrer to the petition filed recently by Attorney Frank V. Benton, representing W. L. Glazier, W. A. Paterson and John J. Fischer, Newport business men. Attorney Benton attacked the ordinance because, he alleged, it had not been properly advertised, that it conflicted with an ordinance adopted by the City Commissioners of Newport and with the rights of the Cincinnati, Newport & Covington Traction Company under a franchise for the crosstown line in 1906. Attorney Benton declared that sections of the ordinance conflicted with other franchises and that since the grant had been adopted under the initiative and referendum clause of Kentucky no one had power to change it except the voters. The arguments concluded, the court issued an order overruling the demurrer to the petition. Solicitor Spence declined to plead further and announced that the case would be carried to the Court of Appeals at once in order to get an early decision.

Program of Association Meeting

Iowa Electric Railway Association

The next meeting of the Iowa Electric Railway Association will be held at Des Moines, Ia., on May 24 and 25.

Financial and Corporate

Insurance Holdings Analyzed

Utility Bonds Increase Nearly $75,000,000, or 67 Per Cent, from 1904 to 1914—Stocks Fall Off $6,800,000, or 34 Per Cent

Orlow H. Boies, statistician Association of Life Insurance Presidents, has made an interesting analysis of life insurance investments during the decade 1904-1914. The data collected show that railroad and public utility bond holdings made a large gain in per cent during the ten years, but that the stock issues of such corporations showed a falling off. The detailed results of the study are presented in the accompanying table.

For 1904 an analysis was made of the investments of sixty-three insurance companies, these being 67.75 per cent of the number of companies then in existence but holding more than 99.5 per cent of the total admitted assets for that year. For the last year in the decade a study was made of the investment of 116 companies, or 46.5 per cent of the total, these representing, however, 97.9 per cent of the total admitted assets of all American companies.

The investments shown in the accompanying table are divided into fourteen classes, some of which need a word of explanation. Class 5 includes bonds of "railroads" so called and recorded by the Interstate Commerce Commission, while Class 7 includes the bonds of street railways and interurban electric railways. Class 7 also includes the bonds of all gas, electric light, power, water, telephone and telegraph and other companies generally included in the public utility group. Class 6 covers national and state bonds as well as bonds of every minor civil division, such as county, municipal, levee and drainage districts, school districts, etc. Class 9 includes stocks of companies of the same character as Class 5, while Class 10 covers the stocks of corporations in Class 7.

The most notable group in the whole statement is Class 6—state, county and municipal securities. This class showed the highest rate of increase of all investments over which the insurance companies have control, the securities therein having increased from $163,194,690 in 1904 to $534,607,399 in 1914, or 227.59 per cent. Only policy loans showed a more rapid rate of growth. As the amount of money invested by life insurance companies in national and state bonds is comparatively small, the great bulk of this increase was in municipal bonds. During the decade the insurance companies increased their investments in such bonds by nearly double the rate of increase in municipal indebtedness and took more than one-fifth of the total new securities of this character.

To consider now Class 5 or steam railroad bonds, it will be noted that these issues increased $505,331,933, or 67.32 per cent during the decade. This investment, however, fell short of keeping up with the increase in the total amount of railroad bonds in the country, which during the period amounted to 68.28 per cent. The proportion of the total bonded indebtedness of the railroads held by life insurance companies fell a trifle, as in 1904 they held 10.92 per cent of the total outstanding bonded debt, while in 1914 they held 10.86 per cent. Moreover, the proportion of admitted assets invested in railroad bonds decreased from 30.16 per cent in 1904 to 26 per cent in 1914.

During the decade the investment in public utility bonds increased $74,638,500, or 67.11 per cent. This percentage increase, it will be observed, was only a trifle lower than that for the steam railroad bond increase. No statistics were presented to show how the utility securities were divided according to the class of service rendered. For the whole group there was a reduction in the percentage of utility bonds to total assets from 4.47 per cent in 1904 to 3.84 per cent in 1914.

In contrast to the various classes of bond issues, the stock investments of insurance companies decreased about $50,000,000 in the decade. The largest reduction ($28,892,929, or 51.61 per cent), was in stocks of banks and other financial institutions, railroad stocks coming second and public utility stocks third. The railroad stocks showed a marked decline not only in relation to other investments but in amount. They decreased $12,570,051, or 27.52 per cent, during the decade, and were in 1914 only 0.68 per cent of the total assets as compared to 1.83 per cent in 1904. Public utility stocks showed a falling off of $6,853,182, or 34.64 per cent, the percentage to total assets dropping from 0.79 per cent to 0.26 per cent. All other stocks decreased 33.31 per cent and represented 0.04 per cent of the total assets in 1914.

ANALYSIS OF SECURITY HOLDINGS OF INSURANCE COMPANIES FOR DECADE 1904-1914

Classes of Assets	Assets, Dec. 31, 1904	Per Cent of Total 1904	Per Cent of Total 1914	Assets. Dec. 31, 1914	Change in Investments in 1914, Compared with 1904	Amount	Per Cent
1. Real estate	$178,425,828.15	7.17	3.40	$164,547,316.69	—	$13,878,610.46	— 7.78
2. Mortgage loans	681,017,925.88	27.37	34.46	1,660,168 266.09	+	979,119,342.21	+143.76
3. Collateral loans	42,332,616.87	1.70	0.39	18,984,766.48	—	23,347,850.39	— 55.15
4. Policy loans and premium notes	187,644,831.22	7.54	14.94	722,406,573.67	+	534,761,740.45	+284.98
5. Railroad bonds	750,668,349.33	30.16	26.00	1,256,000,282.46	+	505 331,933.13	+ 67.32
6. State, county and municipal bonds	163,194,690.20	6.57	11.06	534,607,399.84	+	371,412,809.64	+227.59
7. Public service bonds	111,209 859.14	4.47	3.84	185,848,359.57	+	74,638,500.43	+ 67.11
8. All other bonds	17,470,168.18	0.70	0.61	30,113,643.97	+	12 643,475.79	+ 72.37
9. Railroad stocks	45,681,425.92	1.83	0.68	33,111,374.04	—	12,570,051.88	— 27.52
10. Public service stocks	19,779,115.45	0.79	0.26	12,925,933.36	—	6,853,182.09	— 34.64
11. Stock of banks, trust companies, etc	55,983,962.05	2.24	0.56	27,091,032.48	—	28,892 929.57	— 51.61
12. All other stocks	3,158,848.14	0.12	0.04	2,106,703.18	—	1,052,144.96	— 33.31
13. Non-ledger assets less non-admitted assets	130 641,641.21	5.24	1.80	87,308,951.86	—	43,332,690.35	— 33.17
14. Cash in bank	101,791,372.83	4.08	1.95	94,933,919.43	—	6 857,453.40	— 67.36
Total admitted assets	$2,489,030,634.57	100.00	100.00	$4,830,154,523.12	+	$2,341,122,888.55	+ 94.05

Annual Report

Ottawa Traction Company, Ltd.

According to the annual report of the Ottawa (Ont.) Traction Company, Ltd., the gross receipts of the operating company, the Ottawa Electric Railway, for the twelve months ended Dec. 31, 1916, totaled $1,154,912, as compared to $1,041,100 for the preceding year, an increase of $113,812, or 10.9 per cent. The total expenses, including mileage payments, taxes and interest, were $776,587 for the last year, as compared with $742,123 for the year preceding, an increase of $34,464, or 4.5 per cent. As a result the net income for the last year at $378,324 represented an increase of $79,348, or 26.5 per cent. The net earnings after operating expenses and maintenance, increased $100,789, or 26.2 per cent. The percentage of operating expenses to receipts for 1916 was 58 per cent, as compared to 63.2 per cent in 1915.

The net result of the year was that the company paid the usual quarterly dividends of 3 per cent, and a bonus of 3 per cent, all totaling $281,535. It also paid as a war tax $21,143, wrote off $65,000 for depreciation, and placed $31,789 to the credit of profit and loss. The balance at the credit of the profit and loss account on Dec. 31 was $249,504.

During 1916 a total of 27,093,778 passengers was carried, as compared with 24,361,867 in 1915, an increase of 2,671,911. The only expenditure of importance in the way of new work or renewals carried out in 1916 was for reconstructing a section of track on Rideau Street, and replacing the old rail with heavy girder rail. No extensive renewal work is contemplated during 1917, but with traffic increasing in the present ratio, it is said, the company in the near future will be required to make a substantial increase in rolling stock equipment.

Electric Railway Statistics

Returns for the Year Ended Dec. 31, 1916, Compared with Those for 1915 and 1914, Indicate an Improvement Over 1915

A comparison of electric railway statistics for the twelve months ended Dec. 31, 1916, with figures for the corresponding period of 1915 and 1914, made by the information bureau of the American Electric Railway Association, indicate an improvement in the electric railway business of the United States over that done in 1915, together with some improvement over the year 1914. In the Eastern district the improvement over 1914 was greater than over 1915, while the reverse was true of the Southern district. Returns from the Western district indicate that 1916 was not so good a year as 1914 though an improvement over 1915. In all districts increasing expenses and taxes accompany the advance in net earnings and net income. Data for the twelve months representing 7910 miles of line of companies scattered throughout the country indicate an increase in operating revenues of 6.34 per cent over 1915 and of 4.49 per cent over 1914, in operating expenses of 6.86 and 4.86 per cent respectively and in net earnings of 5.78 and 3.88 per cent. Data representing 7497 miles of line indicate an increase in the amount of taxes paid of 7.94 per cent over 1915 and of 7.32 per cent over 1914, while the operating income increased 5.24 per cent over 1915 and 4.48 per cent over 1914.

OPERATING RATIO INCREASED

The operating ratio of the United States as a whole increased from 62.03 in 1914 to 62.25 in 1916. The experience of the past few months would seem to indicate, however, that in spite of all possible economies an increase is to be expected in the future. In the Western and Southern districts the operating ratio was somewhat higher during the year 1915 than during either 1914 or 1916, while the reverse was true of the Eastern district.

The number of revenue passengers carried by companies representing 5412 miles of line increased 9.71 per cent over 1915 and 5.20 per cent over 1914, while the number of transfer passengers increased 5.97 per cent over 1915 and 5.41 per

TABLE I

REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR TWELVE MONTHS ENDING DECEMBER 31, 1916. COMPILED FROM MONTHLY RETURNS OF ELECTRIC RAILWAYS TO THE AMERICAN ELECTRIC RAILWAY ASSOCIATION

Account	United States			Eastern District			Southern District			Western District		
	Amount, 1916 (in thousands)	Increase over 1915, per cent	Increase over 1914, per cent	Amount. 1916 (in thousands)	Increase over 1915, per cent	Increase over 1914, per cent	Amount, 1916 (in thousands)	Increase over 1915, per cent	Increase over 1914. per cent	Amount, 1916 (in thousands)	Increase over 1915, per cent	Increase over 1914, per cent
Operating revenues	$207,520	6.34	4 49	$148,162	6 26	7.02	$11,987	10.57	*0 33*	$47,371	5 56	*1.58*
Passenger revenues	196,738	6.18	4 50	139,234	6.01	7 17	11,472	10.99	*0 29*	46,032	5.55	*1 72*
Other railway operating revenues	10,782	9.32	4.31	8,928	10 32	4.76	515	2.03	*1.24*	1,339	5,78	3.55
Operating expenses	129,187	6.68	4.86	91,478	7.53	6.66	6,898	7 28	*2 07*	30,811	4.09	1.40
Net earnings	78,333	5.78	3.88	56,684	4.26	7.61	5,089	15.38	2.12	16,560	8.40	*6.69*
Operating ratio, per cent 1916	62.25	.....	.....	61.74	.....	.....	57.55	.....	.....	65 04	.....	......
Operating ratio, per cent 1915	62.05	.....	.....	61 01	.....	.....	59.32	.....	.....	65.96	.....	......
Operating ratio, per cent 1914	62.03	.....	.....	61.95	.....	.....	58 57	.....	.....	63.13	.....	......
Average number of miles of line represented	7,910	.....	.....	5,303	.....	.....	778	.....	.....	1,829	.....	......

COMPANIES REPORTING TAXES

Account	United States			Eastern District			Southern District			Western District		
Operating revenues	$201,100	6.26	4.87	$147,975	6.26	7 03	$9,103	9 46	*1.37*	$44,022	5.62	*0.55*
Operating expenses	125,158	6.60	4.82	91,397	7.54	6.66	5,066	5.77	*5.99*	28,694	3.88	1.32
Net earnings	75,942	5.69	4.95	56,578	4.25	7.62	4,037	14.46	5.11	15,328	9.05	*3.89*
Taxes	12,825	7.94	7.32	9,185	9.23	6.70	718	6.28	12.30	2,922	4.44	8.11
Operating income	63,117	5.24	4.48	47,393	3.33	7.80	3,319	16.40	3.68	12,406	10.20	*6.34*
Operating ratio, per cent 1916	62.24	.....	.....	61.77	.....	.....	55.65	.....	.....	65.18	.....	......
Operating ratio, per cent 1915	62.03	.....	.....	61.03	.....	.....	57.59	.....	.....	66.28	.....	......
Operating ratio, per cent 1914	62.27	.....	.....	61.98	.....	.....	58.39	.....	.....	63.97	.....	......
Average number of miles of line represented	7,497	.....	.....	5,250	.....	.....	571	.....	.....	1,676	.....	......

NOTE.— Figures in *italics* indicate decrease.

TABLE II

DETAILS OF OPERATING EXPENSES OF ELECTRIC RAILWAYS FOR THE YEAR ENDING DECEMBER 31, 1916

Account	United States			Eastern District			Southern District			Western District		
	Amount, 1916 (in thousands)	Increase over 1915, per cent	Increase over 1914, per cent	Amount, 1916 (in thousands)	Increase over 1915, per cent	Increase over 1914, per cent	Amount, 1916 (in thousands)	Increase over 1915, per. cent	Increase over 1914, per cent	Amount, 1916 (in thousands)	Increase over 1915, per cent	Increase over 1914, per cent
Operating expenses	$92,205	9.03	6.52	$54,496	12.28	10.92	$6,898	7.28	*2.07*	$30,811	4.09	1.40
Way and structures	10,531	8.84	0.75	6,203	14.01	5.66	840	13.08	*2.97*	3,488	*0.11*	*6.14*
Equipment	8,372	7.98	4.66	4,493	11.14	13.06	753	19.11	2.54	3,125	1.54	*5.02*
Total maintenance and renewal*	24,634	9.41	4.64	14,910	12.68	10.16	1,593	15.85	*0.44*	8,130	2.82	*3.29*
Power	14,492	10.31	8.02	8,504	13.94	10.07	861	4.22	*1.47*	5,127	5.77	6.46
Conducting transportation	38,995	9.01	8.26	23,275	11.89	12.51	3,259	4.82	*2.98*	12,461	5.05	4.09
Traffic	398	*5.48*	1.02	162	*21.57*	*16.27*	47	32.41	*0.31*	189	5.65	23.27
General and miscellaneous	13,731	7.61	4.10	7,645	11.91	9.37	1,138	4.97	*2.21*	4,948	2.13	*1.75*
Transportation for investment — Cr.	*45*	.....	.....	....	.....	.....	....	.....	.....	*44*	.....	......
Average number of miles of line represented	7,208	.....	.....	4,601	.....	.....	778	.....	.....	1,829	.....	......

* Contains an amount not apportioned between "Maintenance of Way and Structures" and "Maintenance of Equipment."

cent over 1914, the revenue car mileage 4.11 and 2.13 per cent and the revenue car-hours 3.40 and 0.20 per cent respectively.

In general there are apparent decreases in the number of express, freight, mail, etc., car-miles and car-hours run as well as in the number of free passengers carried. The average fare per revenue passenger decreased 0.40 per cent over 1914 and 0.60 per cent over 1915, while the average fare per passenger, including transfers, decreased 0.25 per cent over 1914. Both of these figures, however, are based upon the combined returns of both city and interurban electric railways.

The average number of revenue passengers per passenger car-mile increased 2.89 per cent over the year 1914 and 5.38 per cent over 1915. The returns from the city and interurban electric railway companies, as shown in detail in the appended tables, have all been classified according to the geographical grouping indicated in table V, viz.: Eastern District—east of the Mississippi River and north of the Ohio River. Southern District — south of the Ohio River and east of the Mississippi River. Western District—west of the Mississippi River.

WHAT TABLE I SHOWS

Table I shows the revenues, expenses and net earnings of over 110 electric railways in the United States as well as the operating income of a slightly smaller number of companies reporting taxes. Difficulty in obtaining 1914 data, together with the limited time after the close of the calendar year 1916 available for tabulation, made it impossible to include a greater number of companies in this summary. It is believed, however, that data here given are fairly representative of conditions as a whole. Of the three groups shown on this table, returns for the Western indicate that it has as yet apparently failed to recover from the effects of the unregulated jitney competition of the past two to three years. Though net earnings for 1916 show some improvement over 1915, they were still 6.69 per cent below those of 1914. Returns for the Southern group show considerable improvement over 1915 and very slight improvement over 1914,

TABLE III

TRAFFIC STATISTICS OF ELECTRIC RAILWAYS FOR THE YEAR ENDING DECEMBER 31, 1916

ACCOUNT	United States			Eastern District			Southern District			Western District		
	Amount, 1916 (in thousands)	Increase over 1915, per cent	Increase over 1914, per cent	Amount, 1916 (in thousands)	Increase over 1915, per cent	Increase over 1914, per cent	Amount, 1916 (in thousands)	Increase over 1915, per cent	Increase over 1914, per cent	Amount, 1916 (in thousands)	Increase over 1915, per cent	Increase over 1914, per cent
Car miles — total	$411,290	4.12	2.18	$215,042	4.26	1.66	$36,503	5.90	4.20	$159,744	3.54	2.43
Passenger car miles	404,165	4.20	2.22	210,733	4.32	1.59	35,960	6.05	4.54	157,472	3.65	2.58
Other revenue car miles	4,632	*3.07*	*5.12*	3,280	*3.81*	0.35	327	6.54	*19.77*	1,024	*3.43*	*15.04*
Non-revenue car miles	2,493	4.52	10.00	1,029	22.77	26.59	216	*14.88*	*3.64*	1,248	*3.50*	1.53
Car hours — total	44,228	3.23	0.18	23,019	3.61	*0.13*	4,126	5.28	1.67	17,083	2.25	0.25
Passenger car hours	43,466	3 45	0.42	22,589	3.79	0.10	4,049	5.86	2.34	16,828	2.46	0.40
Other revenue car hours	499	*5.75*	*15.54*	327	*7.57*	*13.87*	51	5.08	*18.37*	120	*4.80*	*18.60*
Non-revenue car hours	263	*12.55*	*3.63*	103	3.61	*0 14*	26	*43.07*	*34.28*	135	*13.88*	2.84
Passengers — total	2,948,359	8.85	4.81	1,559,216	11.59	10.61	199,248	17.68	3.79	1,189,895	4.20	*1.76*
Revenues passengers	2,295,434	9.71	5.20	1,275,051	11.84	10.85	162,172	17.87	3.53	858,212	5.37	*1.93*
Transfer passengers	624,589	5.97	5.41	270,451	10.85	14.55	32,433	17.26	5.26	321,704	1.24	*1.19*
Free passengers	28,336	5.33	*26.25*	13,714	4.61	*41.32*	4,643	14.09	2.90	9,979	2.65	*5.30*
Average fare per passenger												
Per revenue passenger	5.02¢	*0.60*	*0.40*	5.00¢	*0.20*	.....	4.98¢	*3.12*	*2.55*	5.07¢	*0.20*	*0.40*
Per passenger (including transfers)	3.95¢	0.25	*0.25*	4.12¢	*0.25*	*0.73*	4.15¢	*3.04*	*2.81*	3.68¢	0.54	*0.81*
Average number of revenue passengers per passenger car mile	5.68	5.38	2.89	6.05	7.27	8.81	4.50	10.83	*1.10*	5.45	1.67	*4.39*
Average number of miles of line represented	5,412	.....	.....	3,251	.....	.....	588	.....	.....	1,573	.....	.....

NOTE.— Figures in *italics* indicate decrease.

TABLE IV

OPERATING REVENUES AND EXPENSES OF ELECTRIC RAILWAYS PER REVENUE CAR MILE, YEAR ENDING DECEMBER 31, 1916

ACCOUNT	United States			Eastern District			Southern District			Western District		
	Amount, 1916 (in cents)	Increase over 1915, per cent	Increase over 1914, per cent	Amount, 1916 (in cents)	Increase over 1915, per cent	Increase over 1914, per cent	Amount, 1916 (in cents)	Increase over 1915, per cent	Increase over 1914, per cent	Amount, 1916 (in cents)	Increase over 1915, per cent	Increase over 1914, per cent
Per revenue car mile:												
Operating revenues	29 43	4.80	2.68	31.53	6.99	9.14	22.95	7.29	*3.21*	28.08	1.30	*4.72*
Operating expenses	17.66	2.97	2.55	17.91	5.48	6.73	13.69	3.01	*2.00*	18.22	*0.11*	*1.88*
Net earnings	11 77	7.68	2.88	13.62	9.05	12.47	9.26	14.32	*4.93*	9.86	*4.01*	*9.62*
Revenue car miles*	408,796	.....	.....	214,012	.....	.....	36,288	.....	.....	158,496	.....	.....
Average number of miles of line represented	5,412	.....	.....	3,251	.....	.....	588	.....	.....	1,573	.....	.....

OPERATING REVENUES AND EXPENSES OF ELECTRIC RAILWAYS PER REVENUE CAR HOUR, YEAR ENDING DECEMBER 31, 1916

	(In dollars)			(In dollars)			(In dollars)			(In dollars)		
Per revenue car hour:												
Operating revenues	2.73	5 79	4.59	2.94	7.30	10.94	2.03	7.41	*0.98*	2.63	2.73	*2.59*
Operating expenses	1.64	3.79	4.45	1.67	5.69	8.44	1.21	3.42	.....	1.70	0.59	.....
Net earnings	1.09	8.91	4.80	1.27	9.48	14.41	.82	13.89	*2.38*	92	4.55	*8.00*
Revenue car hours*	43,965	.....	.....	22,916	.....	.....	4.101	.....	.....	16,948	.....	.....
Average number of miles of line represented	5,412	.....	.....	3,251	.....	.....	588	.....	.....	1,573	.....	.....

* The last three figures are omitted.

NOTE.— Figures in *italics* indicate decrease.

the latter being probably due to rigid economy and the introduction of such money-saving devices as the one-man car. The Eastern district, where during 1914 there was considerable business stagnation and unemployment, shows an increase in the net earnings of 1916 over those of 1914 of 7.61 per cent. On the other hand for this section of the country 1915 was a better year than 1914 and therefore the net earnings of 1916 increased over those of 1915 but 4.26 per cent. All groups indicate an increase in the amount of taxes paid, the greatest percentage increase over 1914 occurring in the Southern district and over 1915 in the Eastern.

Table II shows the details of the operating expenses of companies represented by 7208 miles of line. An examination of this table indicates considerable increases in all items of expense except "traffic" both over 1914 and 1915. The Southern district, however, shows some decreases over 1914, and this is also in a measure true of the Western district.

Table III gives the traffic statistics of companies represented by 5412 miles of line. All groups indicate increases over 1915 in the number of passengers carried and car-miles and car-hours run. All but the Western show similar increases over 1914, the Western showing a decrease of 1.76 per cent in the number of passengers carried. The Southern district shows the greatest percentage increase over 1915 in the number of transfer passengers carried; the Western, the least. A large number of companies keep no record of free passengers, or "deadheads" as they are popularly known, and the records of free passengers as shown on the table are, therefore, somewhat smaller than the actual figures. Available data, however, indicate a considerable decrease in all but the Southern district, in the number of such passengers carried. The average fare per revenue passenger has decreased in all districts. This is also in part true of the average fare per passenger, including transfers. The average number of revenue passengers per passenger car-mile has increased in all districts as compared with 1915 and in the Eastern as compared with 1914. The increase for the United States as a whole is one of 5.38 per cent over 1915 and one of 2.89 per cent over 1914.

In Table IV there are shown the revenues. expenses and net earnings per revenue car-mile and per revenue car-hour, together with the per cent increase or decrease over the corresponding figures for 1915 and 1914. There are also given the number of revenue car-miles and revenue car-hours involved with the last three figures omitted. The net earnings per revenue car-mile increased 7.68 per cent over 1915 and 2.88 per cent over 1914, while there were similar increases per revenue car-hour of 8.91 and 4.80 per cent respectively. As compared with 1914, the Southern and Western groups show decreases in net earnings per revenue car-mile of 4.93 and 9.62 per cent respectively and similar decreases per revenue car-hour of 2.38 and 8 per cent respectively.

In Table V is given the monthly comparison for the month of December, 1916.

TABLE V—REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR DECEMBER 1916

	Companies Not Reporting Taxes		Companies Reporting Taxes	
	Amount	Per Cent Increase	Amount	Per Cent Increase
*United States**				
Operating revenues	$17,074,794	6.86	$15,980,564	6.59
Operating expenses	11,116,981	11.95	10,473,383	12.13
Net earnings	5,957,813	†1.50	5,507,181	†2.56
Taxes	....	...	1,026,164	7.03
Operating income	....	...	4,481,017	†4.52
Operating ratio, per cent:				
1916	65.11	...	65.54	...
1915	62.15	...	62.30	...
Miles of line represented	9,057	...	8,153	...
*Eastern District**				
Operating revenues	$11,036,964	6.03	$10,923,518	5.96
Operating expenses	7,519,094	17.24	7,464,572	17.34
Net earnings	3,517,870	†11.96	3,458,946	†12.38
Taxes	....	...	694,995	16.08
Operating income	....	...	2.763,951	†17.47
Operating ratio, per cent:				
1916	68.13	...	68.33	...
1915	61.61	...	61.71	...
Miles of line represented	5,644	...	5,440	...
*Southern District**				
Operating revenues	$1,405,785	8.79	$798,884	8.90
Operating expenses	769,051	7.81	403,918	4.55
Net earnings	636,734	10.01	394.966	13.73
Taxes	....	...	66.033	†6.12
Operating income	....	...	328.933	18.77
Operating ratio, per cent:				
1916	54.71	...	50.56	...
1915	55.21	...	52.66	...
Miles of line represented	1,002	...	534	...
*Western District**				
Operating revenues	$4.632,045	8.29	$4,258.162	7.81
Operating expenses	2,828,836	.91	2,604,893	.48
Net earnings	1,803.209	22.32	1,653.269	21.82
Taxes	....	...	265.136	†8.48
Operating income	....	...	1,388,133	30.05
Operating ratio, per cent:				
1916	61.07	...	61.17	...
1915	65.54	...	65.64	...
Miles of line represented	2,411	...	2,179	...

*Groupings are as follows: *Eastern District*—East of the Mississippi River and north of the Ohio River. *Southern District*—South of the Ohio River and east of the Mississippi River. *Western District*—West of the Mississippi River.

†Decrease.

American Cities Company, New York, N. Y.—New officers have been elected for the American Cities Company as follows: Francis T. Homer, New York, president; H. J. Pritchard, New York, secretary-treasurer; Hugh E. Vincent, New Orleans, assistant secretary-treasurer. Lee Benoist. New Orleans, and E. G. Connette, New York, were re-elected vice-presidents. The new directors of the company are Arsene Perrilliat and A. B. Wheeler, both of New Orleans. Walter J. Schwenk, heretofore with the American Cities Company, has been made assistant secretary of the New Orleans Gas Light Company. L. F. Barbier, former secretary and statistician of the American Cities Company, has been made statistician of both companies. H. J. Jumonville, auditor of the American Cities Company, retires on April 1.

Boston (Mass.) Elevated Railway.—In an order issued on March 24 the Massachusetts Public Service Commission authorized the West End Street Railway to issue 11,694 shares of common stock to pay for additions and improvements to its property made by the Boston Elevated Railway, the lessee. The West End Street Railway petitioned for authority to issue 18,000 shares, but the commission pointed out that there was in the company's treasury more than $33,000, representing excess on bonds issued under authority of previous orders. The commission found that there was due from the West End Street Railway to the Boston Elevated Railway on account of improvements to the former company's property the sum of $618,248. The sale of the 11,694 shares authorized by the order made on March 24, together with the excess now in the treasury of the West End Street Railway, will provide the amount required to liquidate the West End Company's indebtedness to the Boston Elevated Railway.

Central California Traction Company, San Francisco, Cal.—Bondholders of the Central California Traction Company have received from the company agreements which they are asked to sign binding themselves to relinquish a claim to 5 per cent interest on the $1.400,000 of first mortgage bonds and accept instead 2 per cent interest for the coming three years. The agreement also waives the sinking fund provision which is demanded by the deed of trust.

Chicago, Aurora & De Kalb Railroad, Aurora, Ill.—Claims to the amount of $70,000 against the Chicago, Aurora & De Kalb Railroad are reported to have been settled by six out of seven claimants accepting bonds for the full amount of their claims and by the other claimant being satisfied with cash. As a result the receivership has been lifted. A syndicate headed by H. H. Evans is said to be negotiating to take over the property.

Monongahela Valley Traction Company, Fairmont, W. Va.—The Kanawha Traction & Electric Company and Monongahela Valley Traction Company have concluded an arrangement whereby the Monongahela Valley Traction will take over the Kanawha Traction & Electric Company. The preferred and the common stocks of the Monongahela Valley Traction Company will be converted into stock of par value of $25. The Monongahela Valley Traction Company's 5 per cent preferred stock will be exchanged for 6 per cent preferred stock on the basis of eighty-four shares of new stock for 100 shares of the present 5 per cent stock. The Kanawha Traction & Electric Company will receive practically 44,000 shares of preferred and 44,000 shares of common stock, par value $25, which will be distributed by that company to the present stockholders.

Dividends Declared

Athens Railway & Electric Company, Athens, Ga., quarterly, 1¼ per cent, preferred.

Bangor Railway & Electric Company, Bangor, Me., quarterly, 1¾ per cent, preferred.

Capital Traction Company, Washington, D. C., quarterly, 1¼ per cent.

Chicago (Ill.) City Railway, quarterly, 2 per cent.

Cities Service Company, New York, N. Y., monthly, one-half of 1 per cent, common and preferred; one-half of 1 per cent on common payable on stock.

Elmira Water, Light & Railroad Company, Elmira, N. Y., quarterly, 1¾ per cent, first preferred; quarterly, 1¼ per cent, second preferred stock.

Houghton County Traction Company, Houghton, Mich., 3 per cent, preferred.

Louisville & Northern Railway & Lighting Company, Louisville, Ky., quarterly, three-quarters of 1 per cent.

Louisville (Ky.) Traction Company, 2½ per cent, preferred; quarterly, 1 per cent, common.

Monongahela Valley Traction Company, Fairmont, W. Va., quarterly, 1¼ per cent, common.

New York State Railways, Rochester, N. Y., quarterly, 1¼ per cent, preferred; quarterly, 1 per cent, common.

New Orleans Railway & Light Company, New Orleans, La., quarterly, 1¼ per cent, preferred.

Omaha & Council Bluffs Street Railway, Omaha, Neb., quarterly, 1¼ per cent, preferred; quarterly 1 per cent, common.

Philadelphia & Western Railway, Upper Darby, Pa., quarterly, 62½ cents, preferred.

Porto Rico Railways, Ponce, P. R., quarterly, 1¾ per cent, preferred.

Republic Railway & Light Company, New York, N. Y., quarterly, 1½ per cent, preferred; quarterly, 1 per cent, common.

Electric Railway Monthly Earnings

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

Period		Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan.,	'17	$107,049	*$75,444	$31,605	$32,660	†$1,055
1 " "	'16	101,420	*63,311	38,109	28,855	9,254
12 " "	'17	1,241,252	*835,578	405,674	360,129	45,545
12 " "	'16	1,107,434	*730,834	376,600	357,268	19,332

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO.

Period		Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan.,	'17	$36,436	*$22,134	$14,302	$11,436	$2,866
1 " "	'16	30,900	*18,308	12,592	11,061	1,531

CITIES SERVICE COMPANY, NEW YORK, N. Y.

Period		Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb.,	'17	$1,681,868	$31,813	$1,650,055	$303	$1,649,752
1 " "	'16	673,406	18,357	655,049	44,186	610,863
12 " "	'17	12,309,710	256,359	12,053,351	172,408	11,880,943
12 " "	'16	5,002,685	183,453	4,819,232	495,485	4,323,747

HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.

Period		Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb.,	'17	$497,800	*$231,327	$266,473	$216,203	$50,270
1 " "	'16	472,259	*210,864	261,395	213,307	48,088
2 " "	'17	1,039,095	*465,660	573,435	432,434	141,001
2 " "	'16	967,818	*422,149	545,669	426,704	118,965

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

Period		Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb.,	'17	$2,205,349	$1,274,258	$931,091	$813,678	$117,413
1 " "	'16	2,036,166	1,150,743	885,423	816,738	68,685
8 " "	'17	18,490,282	10,363,493	8,126,789	6,514,716	1,612,073
8 " "	'16	16,607,058	9,311,215	7,295,843	6,529,309	766,534

PUGET SOUND TRACTION LIGHT & POWER COMPANY, SEATTLE, WASH.

Period		Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan.,	'17	$787,869	*$471,237	$316,632	$191,925	$124,707
1 " "	'16	669,593	*431,271	238,322	182,651	55,671
12 " "	'17	8,225,647	*5,160,961	3,064,686	2,222,257	842,429
12 " "	'16	7,558,290	*4,764,384	2,793,906	2,184,496	609,410

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO.

Period		Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb.,	'17	$357,645	*$251,654	$106,001	$78,685	‡$28,301
1 " "	'16	310,459	*180,245	130,214	64,930	‡39,719
2 " "	'17	737,428	*508,748	228,679	157,410	‡73,097
2 " "	'16	628,774	*362,810	265,964	132,217	‡134,393

TWIN CITY RAPID TRANSIT COMPANY MINNEAPOLIS, MINN.

Period		Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb.,	'17	$827,373	$576,858	$250,515	$135,612	$114,903
1 " "	'16	810,420	523,051	287,369	136,345	151,024
2 " "	'17	1,725,306	1,189,020	536,286	284,975	251,311
2 " "	'16	1,640,703	1,066,250	574,453	282,296	292,157

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

Hearing on One-Man Cars

Two Companies Apply to Massachusetts Commission for Privilege to Use One-Man Cars—Birney Design Favored

Petitions of the Boston Elevated Railway and the Brockton & Plymouth Street Railway, Plymouth, Mass., for authority to use one-man cars on certain lines were heard by the Massachusetts Public Service Commission at Boston on March 23. H. B. Potter, assistant to the president, appeared for the Boston Elevated Railway. He stated that the company had ordered one car of the Birney type seating thirty passengers for use on the Maverick Square-North Ferry Line in East Boston. The headway on this line was fifteen minutes, and the traffic was correspondingly light. Mr. Potter said that it appeared that two such one-man cars would give more frequent service and probably at a lower cost than a double-end car seating fifty-two passengers and operated by two men. The speaker declared that better service with no increase in cost was a necessity and the cost of the one-man cars was about $35 per seat less than a semi-convertible car of the latest type.

One-Man Cars on the Coast

A. Stuart Pratt, president of the Brockton & Plymouth Street Railway, said that an increased demand for one-man cars in the Puget Sound District was expected following a recent decision of the Supreme Court of the State of Washington, which, it was expected, would prove a death blow to the jitney. He spoke also of a meeting held recently at Fort Worth, Tex., which was attended by Stone & Webster car experts from all parts of the country with a view toward standardizing this type of rolling stock so far as practicable on the Stone & Webster properties, and thereby secure a reduction in cost of this equipment. The Brockton & Plymouth Company desired to operate two Birney cars on its line from Pilgrim Hotel, Plymouth, to Kingston in place of two single-truck cars of an old type. The details of fare collection in zones had not yet been worked out.

Mr. Pratt said that it was proposed to have the door of the permanent car design at each end at the right of the motorman. The same construction would be used for single-end cars, except, of course, in the matter of controllers, etc. If the commission authorized the use of these cars, they could be purchased at $4,000 each by the Brockton & Plymouth Company, but at least a 10 per cent higher price would apply to future purchases. Mr. Pratt said further that unprofitable lines had been greatly improved by the use of one-man cars.

P. J. Murphy, of the Boston division of the Amalgamated Association, opposed the use of one-man cars on the ground that none of the members of the association had experience in their operation. Chairman McLeod characterized this opposition as theoretical and stated that until the board had an opportunity to observe the operation of the cars, it was difficult to judge satisfactorily their fitness for the proposed service.

George H. Martin of the Westinghouse Traction Brake Company next described the emergency features of the door and brake control mechanism of one-man cars. He stated that standard air fittings were used and that the chances of failure were no greater than with other long-tried braking equipment. Other safety features of one-man cars were pointed out by John Lindall, superintendent of rolling stock and shops of the Boston Elevated Railway. He particularly emphasized the fact that easy access was a natural result of the reduced height.

M. A. Cavanaugh, general manager of the Norfolk & Bristol Street Railway, Foxboro, Mass., testified that safe operation is possible with one-man cars. The hearing was then closed.

Eliminating Foreign Cars

Mr. Dana Explains Policy of Boston Elevated in This Connection at the Hearing on Through Service at Boston

At a recent hearing before the Public Service Commission of Massachusetts upon the grant of a location to the Bay State Street Railway in Arlington to permit the operation of through car service from Winchester to Harvard Square subway station, Cambridge, Edward Dana, manager of surface transportation of the Boston Elevated Railway, discussed the policy of his company relative to the elimination of foreign cars from the system. Mr. Dana pointed out that within the last few years cars of foreign roads had in general been withdrawn from entry into Boston and passengers required to change at the boundaries of the Boston Elevated system. This policy had enabled a more uniform and better spaced service to be rendered within the Boston area, and had enabled the Boston Elevated Railway to make the most of existing station and track facilities through the use of co-ordinated rolling stock.

The demands made to the Boston Elevated Railway for the operation of through cars into such terminals as Harvard Square had come from residents of territory lying laterally with respect to the trunk lines, but the service as a whole had been bettered by confining through service as far as practicable to such trunk lines. The tendency was toward the use of two-car trains and ultimately three-car trains on surface lines radiating from important subway terminals. Mr. Dana said that in the Winchester case, the community virtually lay within the northern rapid transit zone tributary to Sullivan Square terminal, and that the deflection of traffic from Winchester through Arlington would impose additional burdens on Cambridge and Arlington trunk lines already hard pressed to handle the travel in these growing communities. The speaker held that it would be better to increase the present Boston Elevated Arlington-Harvard Square service than to operate the desired through foreign cars from Winchester.

Six-Cent Fare for Boston Elevated

President Brush Advocates Higher Unit Fare as Essential for Relief and Invites Public Investigation

That the 6-cent fare on the Boston (Mass.) Elevated Railway must come as the ultimate solution of its financial problem in relation to transportation development in the Boston metropolitan district was declared by President Matthew C. Brush at the final legislative hearing, March 20, on the company's economic status. Mr. Brush spoke briefly before the committee on metropolitan affairs, supplementing his previous testimony regarding the company's needs. Many places on the system, he stated, should be changed over at once to provide bodily transfer areas, especially where the cost of such a change is relatively small.

With reference to attacks on salaries, Mr. Brush pointed out that all the salaries of the officers are on file at the offices of the Public Service Commission, with all the contracts in force on Sept. 14, 1915, and those since entered into, as well as the list of stockholders. Every detail in the operation of the road, the speaker declared, is open to the public, and anyone seeking information is urged to call at his office.

Referring again to the transfer situation, Mr. Brush said that not another street railway in the world, except the Interborough Rapid Transit Company of New York, N. Y., issues 100,000,000 tickets annually, and this number of transfer checks, which is issued annually at Boston, is greater than the number of passenger tickets issued by the New Haven Railroad. The company received 85,000,000 paper transfers last year. The cost of making up a transfer case in the courts averages $300, and the work is beset with the utmost difficulties. It has been suggested that the company trace the transfer in the way a bank check is handled, but the cost of such a check would be prohibitive. Mr. Brush said that if the public would do less "knocking" and would co-operate more in the interests of safety, the results would be remarkable. The annual outlay for damages is now $800,000, an expenditure which, in the speaker's opinion, does no good to anyone.

Representative Ammidon intimated that the public interest was discouraged by the reception given to suggestions which were deemed impracticable by the management. Mr. Brush emphatically declared that there had been no such attitude since he came to the Boston company. He said he had entertained suggestions whether they came from railroad men or newsboys and that he would guarantee to put any suggestion into effect or prove that it was impracticable.

Mr. Brush said that he personally favored a single fare system in view of the class discrimination effected by the zone system. To permit a man to ride farther for his nickel than he is entitled to is unfair to the man who rides the usual distance for 5 cents.

In closing, Mr. Brush emphasized the fact that the relief sought is the improvement of transportation facilities at Boston, a consideration which weighed heavily in the message sent by Governor McCall to the Legislature when the Boston Elevated investigation was suggested.

City Upheld in Jitney Case

Supreme Court of New Jersey Confirms Authority of Atlantic City to Regulate Its Traffic

The power of the City Commissioners to regulate jitney bus traffic in Atlantic City, N. J., was confirmed in a decision handed down on March 23 by the Supreme Court in the case of William H. Irwin, who attacked the regulating ordinance passed by the commission on the ground that the State jitney law of 1916 had taken the regulation of jitneys out of the hands of municipal authority. In the opinion of the court this right was not taken away, and the city's right to regulate the use of its streets is concurrent with the State's power from the standpoint of public safety.

The points on which the appeal was based and which the court regarded to be without substance were: That the city had no authority over the jitney except in the matter of granting licenses and as provided in the act of 1916; that it was without the right to regulate jitney fares, to demand that a jitney furnish indemnity insurance, to fix a jitney route or to compel a jitney to display a route card; that it was without power to revoke a jitney license for failure to pay a judgment or tax lien, to compel a jitneur to carry policemen and firemen free of charge, or to impose a penalty for violation of such provisions.

Irwin was the only jitney operator who would not submit to the city authorities and cover the routes specified in the ordinance. He attempted twice previously to have the ordinance made inoperative pending results of the trial and also attempted to have forty other jitney men made parties to his action in order that they, too, might be relieved from compliance with the ordinance pending the decision.

Railway Advertises Mobile

The Mobile Light & Railroad Company, Mobile, Ala., is advertising in the leading trade journals of the country, representing those trades which it thinks would do well in Mobile by reason of the supply of raw material near at hand, and on account of the advantageous position of Mobile as a distributing center, not only for a large part of the United States, but also for Cuba, the West Indies, Central and South America. The company is advertising in the furniture journals because it believes Mobile would be a good place for the manufacture of furniture, refrigerators, caskets, and anything else made from oak, ash or gum timber. There is much of such timber adjacent to the river system which flows into the Gulf at Mobile. The company also thinks Mobile would be a good place for the building of motor boats, and even for a ship-building plant. In addition to advertising in a large number of trade journals, the company is also advertising in the dailies of the leading tourist headquarters of the South, calling attention of visitors to the South to the wonderful undeveloped resources of Mobile.

Interstate Fare Increase Allowed

In a recent decision issued by the Interstate Commerce Commission the Shore Line Electric Railway, Norwich, Conn., which controls the Norwich & Westerly Traction Company, operating in Connecticut and Rhode Island, and the Groton & Stonington Street Railway, operating in Connecticut, was granted certain increases in its interstate fares according to a proposed tariff filed with the commission to become effective on Nov. 1, 1915. This tariff, in part, provided as to intrastate traffic that school tickets should be sold in books of 300 tickets for $3, but proposed to cancel in respect of interstate traffic certain provisions pertaining also to commutation ticket books.

Complaints against the proposed changes were filed charging unreasonableness of fares between Westerly, R. I., and points on the Groton & Stonington line in Connecticut. The defendant companies asserted that the increases were compelled because of the insufficient return derived from their former rates and submitted financial statements in considerable detail.

Complaints were also filed at the same time with the Public Utilities Commission of Connecticut relative to the intrastate fare, and this commission, in its decision handed down on May 17, 1916, ruled that the returns afforded by the new schedule were not excessive. The Interstate Commerce Commission, after careful consideration, found that the increased interstate fares, being constructed upon a similar basis, were also reasonable, and the complaints were ordered dismissed.

Investigation of New Orleans Problems

The Commission Council of New Orleans, La., has adopted a resolution suggested by Commissioner Lafaye in a special report, to appoint a committee to investigate the traffic problems of the railways, as proposed by the New Orleans Railway & Light Company recently. The resolution of the Council reads in part as follows:

"Be it further Resolved, That said committee be requested and instructed to make a thorough investigation, and report with respect to transportation conditions in New Orleans, and advise and recommend the steps that should be taken to improve said conditions, whether it be by existing instrumentalities or the inauguration of auxiliary services, such as bus lines, jitneys, etc."

The committee is to report within ninety days to the Council. On the report will depend the final decision of the Council. In the meantime, the jitneys cannot operate unless they give a $5,000 indemnity bond; the proposition before Council has been to amend the jitney ordinance to allow the jitneys to operate under a $5,000 insurance bond which they can readily furnish.

Hearing Closed on Vestibules

Public Service Commission of New York Takes Matter of Inclosed Vestibules Under Advisement

At a hearing held on March 27 by the Public Service Commission of New York, First District, in regard to the establishment of an order requiring fully inclosed vestibules for surface cars, final arguments were presented by the attorneys of several of the interested railways, and at their conclusion Commissioner Whitney, who presided, declared the case closed. From the nature of the statements made by the railways' representatives there appeared to be no very vigorous objections to the promulgation of such an order.

On behalf of the New York Railways and the several other properties in Greater New York controlled by the Interborough-Consolidated Corporation it was stated that there was no intention to resist the proposed order, but that a period of three years would be required to complete the necessary alterations on the companies' cars, provided no change in the labor situation occurred.

The New York Railways was already proceeding with the installation of folding doors and steps, but not a control-interlock, on 439 cars. It was the company's understanding that its center-entrance storage-battery cars which already had entrance doors, but no control interlock, would be excepted from the terms of any such order because of the position of the conductor where he could oversee the door operation, and that 196 small single-truck cars would be excepted because they were obsolete and would be scrapped as soon as possible.

E. A. Maher, Jr., vice-president of the Third Avenue Railway, stated that all of his company's cars in New York City were already equipped with folding doors and steps and interlocked control.

On behalf of the Second Avenue Railroad it was argued that all of that company's cars were very old and that, since they were to be replaced as soon as capital for modern cars could be raised, their remodeling would not be desirable. It was said also that accidents on the Second Avenue's cars were few in number.

No argument was submitted by the Brooklyn Rapid Transit Company at this hearing.

Jitneys File Rates

Nearly 400 passenger autobus lines in California have filed tariffs with the Railroad Commission of that State, in accordance with the ruling recently established by the Supreme Court placing jitneys under the commission's jurisdiction. Fifteen hundred blank forms were sent out by the commission, and only 400 replies have been received. This is partly because some of the former jitneys have ceased to operate and because associations have filed one tariff for all its members. About 150 notices have been returned unclaimed by the post-office department, and fifty replies came from buses that do a "for hire" business only. The commission's investigation shows that jitneys are operating in every section of California and range in size from the individual operator of one small machine to the corporation with fifty expensive cars, each carrying from twenty to forty people. Passenger rates vary from 2½ to 4 cents a mile in level sections, where competition with electric and steam roads exists, to 8 to 15 cents a mile in mountainous sections where roads are poor and there is little or no competition.

More One-Man Cars for Seattle.—The Puget Sound Traction, Light & Power Company has requested authority of the Council of Seattle, Wash., to use on other lines twenty-five one-man cars similar to those now in use on the Bellevue-Summit line.

Rochester Fare Case Started.—Action has been brought in the equity term of the Supreme Court of the State of New York by a stockholder of the Rochester Electric Railway in appeal from the decision of the Court of Appeals denying an increase in fares to the New York State Railways between the Rochester city line and Charlotte territory. The city and the two companies are made defendants. The trial was started on March 20 and was continued during the day, at the close of which adjournment was taken until March 27.

Extension of City Fare Zone Refused.—The Harrisburg (Pa.) Railways have filed with the Public Service Commission an answer to the complaint of T. H. Bogar and others who want the city 5-cent fare zone extended. The company contends that the 5-cent zone runs from Market Square to more than half a mile beyond the city limits, or a distance of 3.28 miles, while the whole Rockville Division is but 5.82 miles long. It is pointed out by the company that persons living on that division have extensive transfer privileges and also that, though the cost of operation has materially advanced, the 15-cent round-trip tickets to Rockville are still maintained.

Employees to Cultivate Right-of-Way.—Officials of the Alton, Granite & St. Louis Traction Company, Alton, Ill., and the East St. Louis & Suburban Railway, East St. Louis, Ill., have announced a plan whereby their employees may plant gardens on the right-of-way. The two systems own about 60 acres of surplus right-of-way, some of which is very fertile. The acreage has been divided and the oldest employee will be given first choice of the sections. The employees are under no obligations. They will plant what they desire and will retain full ownership of the crop. During the summer the gardens will be inspected by disinterested persons, and in the fall five prizes, totaling $200, will be awarded. The employee with the best garden will receive $100.

Trainmen Rewarded for Safe Operation.—The Texas Electric Railway, Dallas, Tex, has inaugurated a plan whereby trainmen will be rewarded for extra care in avoiding accidents. Announcement of the plan was made at a recent meeting of the Texas Traction Company Employees' Benefit Association. There will be five teams of ten men each on the interurban lines, and the team causing the smallest amount of money to be paid out in claims will receive a cash bonus of $150 at the end of the year. The second team will receive $100. For the teams on city lines there will be a first prize of $75 and a second prize of $50. The city-line teams will be six in number, each composed of five men. An individual cash prize of $5 will be given to each trainman who has been responsible for no accident during the year. The plan goes into effect on April 1.

"Calf Clubs" to Increase Freight Traffic.—Three "calf clubs," as a means of increasing freight business, have been organized at Dearborn, Ferrelview and Camden Point, Mo., along the line of the Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., by J. F. Holman, general freight agent of the company, in co-operation with E. K. Slater of the educational department of the Blue Valley Creamery Company, who is manager of the cream territory. Local bankers were induced to buy calves which will be sold to boys of the district, who give 6 per cent interest-bearing notes indorsed by their parents. In the fall the calves will be sold at auction, the bankers receiving the amounts advanced with interest and the boys receiving the increment. It is expected that many of the calves will remain on the farms where they were cared for during the summer, and that in this way the cream production for transportation from the territory will be increased. The first consignment of sixty dairy calves was received at Dearborn on March 19.

Grade Crossing Auto Accidents Considered.—In the discussion of the report of the committee on signs, fences and crossings at the meeting of the American Railway Engineering Association in Chicago, Ill., during the week commencing March 19, it was brought out that during a recent month on one of the railroads there had been twenty-three cases where automobiles had actually run into trains at grade crossings. One case was also cited which had caused the death of the engineer and fireman, after which the company had brought suit against the automobile owner. Great stress was laid on the importance of this subject and the committee was urged to give special consideration to the possibility of providing special signs and means of preventing this form of accident, which, outside of injury claims, was a great menace to the railways. It was also brought out that the Railroad Commission of California was at the present time engaged in a study of the conditions as to why automobiles failed to observe the crossing signs and that some interesting data would probably be made public on the completion of their investigations.

Improvements Suggested in Transit Service.—In reply to notices posted in the subway and elevated trains of the Interborough Rapid Transit Company, New York, N. Y., inviting suggestions for improvements in the service, the committee on city traffic of the Merchants' Association has forwarded to Theodore P. Shonts, president of the company, a number of suggestions received from various sources. The abolition of dead-end elevated terminals at South Ferry is suggested and the substitution of loop tracks for a continuous interchange between the east and west side elevated trains. This, it is said, would make trains more frequent by eliminating switching delays and would provide better distribution of traffic by passengers not being directed to the subway at some points. Stairways and entrances to elevated stations of greater capacity than at present are recommended and also sliding or folding instead of swinging gates for the elevated cars. It is pointed out that the existing over-congestion at the Grand Central subway station is due largely to the interchange of express and local passengers at this point and that the elimination of the stops of local trains during the rush hours would relieve the situation. The carrying of large packages, especially in the subway cars, causes much delay and discomfort to passengers, and it is suggested that some other means of transportation might be provided for baggage in excess of a certain size, which in some cases at present is essentially merchandise.

Personal Mention

H. J. Pritchard has been appointed secretary-treasurer of the American Cities Company, New York, N. Y.

Charles Hoopes, secretary and auditor of the Oklahoma Railway, Oklahoma City, Okla., has been appointed assistant general manager of the company.

C. M. White, dispatcher on the Chicago, South Bend & Northern Indiana Railway, has been appointed chief dispatcher with headquarters at South Bend, Ind.

B. T. Gifford has terminated his connection with Kelsey, Brewer & Company of Grand Rapids, Mich., to become associatd with S. W. Cheney as consulting engineers in that city.

L. F. Barbier, former secretary and statistician of the American Cities Company, New Orleans, La., has been made statistician of that company and the New Orleans Gas Light Company.

Herman Pappert has been promoted to the position of track foreman on one of the lines of the Wheeling (W. Va.) Traction Company to succeed George E. White, who resigned from railway service.

E. R. Kelsey, manager of publicity of the Toledo Railways & Light Company, Toledo, Ohio, was elected district governor of the Rotarians at the convention held at Wheeling, W. Va., on March 23.

J. C. Schott, chief clerk of the claim department of the Public Service Railway, Newark, N. J., has resigned, after ten years of service with the company, to enter the automobile business in Newark.

H. J. Childs, engineer of power and lines of the United Traction Company, Albany, N. Y., has resigned. Mr. Childs was presented with a gold watch by the employees with whom he has been associated.

N. I. Garrison, formerly auditor and assistant manager of the Fort Smith Light & Traction Company, Fort Smith, Ark., has been appointed manager of the El Reno Gas & Electric Company, El Reno, Okla.

Edward Dana, manager of surface transportation of the Boston (Mass.) Elevated Railway, was a candidate for the office of Selectman of Belmont, Mass., in a recent election. He was defeated by only thirty-four votes.

Henry C. Hall, a member of the Interstate Commerce Commission, has been elected chairman of the commission for the ensuing year, according to the custom of selecting the chairman by rotation in the order of seniority.

George R. Sheldon, formerly vice-president and treasurer of the North American Company, New York, N. Y., has been appointed chairman of the board of directors. Mr. Sheldon has been succeeded as vice-president by Henry H. Pierce, but will retain his position as treasurer.

C. G. Reed, chief dispatcher of the Chicago, South Bend & Northern Indiana Railway, located at South Bend, Ind., has been transferred to Elkhart, Ind., where he will have charge of the city lines of Elkhart and Goshen as well as the interurban traffic between those cities.

Walter Coakley, formerly plant superintendent of the Toledo Railways & Light Company, Toledo, Ohio, and recently on temporary detail at the Niagara Light, Heat & Power Company, Tonawanda, N. Y., has been appointed general superintendent of the Knoxville (Tenn.) Gas Company.

Clifford Thorne, formerly chairman of the State Railroad Commission of Iowa and president of the National Association of Railway Commissioners, has resumed the practice of law involving rates, cost analyses and appraisal of railroads and public utilities, with offices in Chicago.

William Kambs, an interurban conductor for the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., has been promoted to the position of superintendent of the city lines of Michigan City and Laporte and the interurban service between those cities, succeeding John Cash, who has been transferred to South Bend.

L. K. Langdon, Lebanon, Ohio, has resigned as a member of the Public Utilities Commission of Ohio. Mr. Langdon was counsel for the commission a few months before his appointment as a member of the commission in 1915. His term expired on Feb. 1, but he has remained on the commission since that time at the request of Governor Cox.

S. W. Cheney, who recently resigned his position with Kelsey, Brewer & Company of Grand Rapids, Mich., is a member of a firm of consulting engineers just organized in Grand Rapids. Mr. Cheney was graduated from the University of Wisconsin in 1904 and was identified with public utilities until 1913, when he was appointed assistant engineer of Kelsey, Brewer & Company.

N. G. Day, formerly electrician for the Massachusetts Northeastern Street Railway, Haverhill, Mass., and the Dover, Somersworth & Rochester Street Railway, Dover, N. H., was recently presented with a fine mahogany chair by the employees with whom he has been associated. Mr. Day has accepted a position as commercial manager with the Rockingham Light & Power Company, Portsmouth, N. H.

G. C. Estill, chief engineer of the Cumberland County Power & Light Company, Portland, Me., and the York County Power Company, has in addition been appointed chief engineer of the Lewiston, Augusta & Waterville Street Railway and the Westbrook Electric Company, which are controlled by the Cumberland County Power & Light Company. In a previous report of his appointment Mr. Estill's name was incorrectly spelled.

Frank H. Warren, formerly assistant claim adjuster for the Union Traction Company of Indiana, Anderson, Ind., has been appointed to succeed James Harmon of Indianapolis, who is transferred to a position with the bureau of safety of the Middle West Utilities Company, with headquarters in Chicago. Mr. Harmon was safety agent for the Interstate Public Service Company, Indianapolis, Ind., and other subsidiary properties of the Middle West Utilities Company.

William Clayton, vice-president and managing director of the San Diego (Cal.) Electric Railway, who was shot and seriously wounded March 12 by an Italian, was reported as being practically out of danger on March 20. According to the railway company's records, Lorenzo Bellomo, the assailant, was injured on July 11, 1914, when he jumped from a moving car. Witnesses asserted that the company was in no way to blame for the accident, but the company paid his hospital bills and gave him $50 when he left the hospital. Later he was employed by the company, but was discharged because he was unsatisfactory as a workman.

H. C. Hoagland, general manager of the Muskogee Gas & Electric Company, Muskogee, Okla., has resigned to accept the position of president and general manager of the Central Oklahoma Light & Power Company, with headquarters in Oklahoma City. Mr. Hoagland formerly was manager of the Fort Smith Light & Traction Company, Fort Smith, Ark., for three years, and was succeeded a few months ago by D. C. Green. Mr. Hoagland has been general manager of the Muskogee plant for seven years, holding that position while residing in Fort Smith and serving as manager of the Fort Smith Light & Traction Company.

John G. Sullivan, president-elect of the American Railway Engineering Association, was born in 1863 at Bushnells Basin, N. Y. He was graduated from Cornell University with the class of 1888 and began railroad work as a rodman on the Great Northern, later becoming assistant engineer. Since 1900 Mr. Sullivan has been connected in various capacities with the Canadian Pacific Railroad with the exception of two years, which he spent in Panama after accepting the position of assistant chief engineer for the Isthmian Canal Commission in 1905. He was advanced to the position of chief engineer of the Canadian Pacific, Lines West, in 1911, the position he now holds. Mr. Sullivan is the builder of the Connaught Tunnel, the longest railway tunnel of the western continent.

E. W. Holst, mechanical engineer of the Bay State Street Railway, Boston, Mass., has resigned from that position to take effect on April 1 and will open an office as a consulting engineer in Boston. Mr. Holst's service with the Bay State Street Railway and its predecessors date from 1904 when he joined the staff as superintendent of car repairs. He had received part of his early technical training with the General Electric Company and part in Norway, the country of his birth. In 1907 he was appointed superintendent of equipment of the Bay State system, and on May 4 of last year to his present position as mechanical engineer of the company. A biographical sketch of Mr. Holst with portrait appeared in the ELECTRIC RAILWAY JOURNAL of March 18, 1916, page 584.

E. Burt Fenton, who for two years has been publicity manager of W. S. Barstow & Company, Inc., has resigned. The first Barstow property with which he became connected was the Sandusky Gas & Electric Company, Sandusky, Ohio, for which he did publicity work during two municipal ownership campaigns, and he also prepared some good-will advertising articles at that time. Mr. Fenton was for several years editor of the Sandusky *Star-Journal* and has also been connected with newspapers in Pittsburgh, Pa., and Columbus, Toledo and Zanesville, Ohio. He wrote "Snuggling Up to John Smith," a paper on public relations, and "The Missing Link," dealing with the question of municipal ownership. Both papers were read at annual conventions of the Ohio Electric Light Association and have attracted much favorable comment from public utility operators.

P. D. Kline, general manager of the Ogden, Logan & Idaho Railway, Ogden, Utah, has resigned, effective April 1. Mr. Kline was at one time connected with the contracting department of the Allis-Chalmers Company and for four years was superintendent of transportation of the Sheboygan Light, Power & Railway Company, Sheboygan, Wis. He then became general superintendent of the Falkenau Electrical Construction Company, Chicago, Ill., in charge of all field construction. He supervised the installation of several large railway and lighting systems and a number of power stations for that company, after which he became general superintendent of the Ogden (Utah) Rapid Transit Company in 1913. Four months later he was appointed general manager for this company and retained this position with its successor, the Ogden, Logan & Idaho Railway until the present time.

L. W. Jacques, who recently was appointed master mechanic of the East St. Louis & Suburban Railway, East St. Louis, Ill., began his railroad career with the Baltimore & Ohio Railroad, which he served fourteen years, finally becoming roundhouse foreman at South Chicago, Ill. He next became foreman of the Thirty-first Street shops of the Twin City Rapid Transit Company, Minneapolis, Minn., where he remained for three years, after which he was for about five years master mechanic of the Fort Wayne & Wabash Valley Traction Company. This company was absorbed by the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., and in June, 1911, Mr. Jacques resigned to become master mechanic of the Rockford & Interurban Railway, Rockford, Ill., which he served until 1914. He has since been associated with M. E. Cooley, consulting engineer, Ann Arbor, Mich., working on valuations of street and interurban railway properties.

Obituary

Charles S. Braddock, Jr., formerly chief medical adviser to the government of Siam and later medical examiner for the Interborough Rapid Transit Company, New York, N. Y., died at his home in Haddonfield, N. J., on March 23 from the effects of paralysis, with which he was stricken last November. Dr. Braddock was known throughout the medical world as a writer on medical subjects and a leading expert on cholera and smallpox. He began his work in Siam in 1901, and a year later was appointed chief medical inspector. He led the fight against diseases which were depopulating the country, succeeded in stamping out the plague and received a diamond-studded medal for his services. In 1907, still suffering from the effects of tropical fevers, he returned to the United States after having written the health and sanitation laws now in effect in Siam. Dr. Braddock was formerly an officer in the New Jersey National Guard, later a lieutenant in the United States Navy and took an active part in the naval battle of Santiago in 1898.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

Milwaukee (Wis.) Western Railway.—Incorporated in Delaware as a holding company to take over the control of the Milwaukee Western Electric Railway, which proposes to construct a line from Milwaukee to Fox Lake, via Hustisford, Juneau and Beaver Dam, with a branch from Sussex south to Waukesha, via Pewaukee, about 74 miles. Capital stock, $2,750,000. The directors include A. P. Keltzsch, W. O. Vilter, and H. C. Kelling, Milwaukee; J. E. Steel, Olderly; A. F. Ryder, Juneau; G. Meissner, Oconomowoc; and J. H. Bach, Chicago. [Jan. 27, '17.]

FRANCHISES

Hartford, Conn.—The Connecticut Company has asked the Board of Street Commissioners for permission to construct additional tracks on Charter Oak and Huyshope Avenues and double tracks on Albany and Blue Hills Avenues, Hartford.

Springfield, Ill.—The Springfield Consolidated Railway has filed a petition with the Railroad Commission of California asking that the commission issue a certificate of convenience and necessity authorizing the company to extend its line from Fourteenth and Germania streets into Bunn Park.

Jamestown, N. Y.—The Panama Traction Company has asked the City Council for a franchise to construct a line in Jamestown. D. L. Davis, Jamestown, general manager. [March 3, '17.]

Columbus, Ohio.—The City Council has, as a committee of the whole, approved the proposed franchise granting the Columbus Railway, Power & Light Company the right to build a line connecting the Chittenden and Eleventh Avenue lines, on the payment of $5,000 to the city.

Youngstown, Ohio.—The franchises for extensions of the Mahoning Avenue, Poland Avenue and Steel Street lines of the Mahoning & Shenango Railway & Light Company, after lengthy discussion at a recent Council meeting, were referred back to the legal department to be rewritten. New drafts will also include a number of suggestions made by members. One of them is that the Poland Avenue and Steel Street extensions be double-tracked.

Juniata, Pa.—The Altoona & Logan Valley Electric Railway has received a franchise from the Borough Council to construct an extension on Fourth Avenue to East Altoona and through the Juniata Park district to the silk mill. The franchise will be submitted to the Public Service Commission of Pennsylvania for its approval.

Pennsburg, Pa.—The Norristown Traction Company has asked the City Councils of Pennsburg, East Greenville and Red Hill for franchises granting the company right-of-way through these towns. The proposed line will extend from East Greenville to Lederach, where it will connect with the Norristown-Harleysville line.

Olympia, Wash.—The Thurston County Commissioners at Olympia recently granted the Tacoma Railway & Power Company a franchise to construct power lines from the Pierce County line to the A. L. Brown farm, near Nisqually, and to extend its lines along county highways near Nisqually, to serve farmers in that district. As a result of the franchise, it is expected that the company will extend its lines still further in Thurston County in the future. While it is unofficially reported the company plans the extension of an electric interurban line from Tacoma to Olympia, nothing definite has been announced, the primary purpose of obtaining the franchise for lighting and power being to supply current to a large farming district near Nisqually.

TRACK AND ROADWAY

Visalia Electric Railroad, Exeter, Cal.—Preliminary surveys are being made by the Visalia Electric Railroad for further extensions of its lines into the foothills east of Porterville, to connect with the Porterville Northeastern Railroad at Adobe station. If built, the line will serve three magnesite mines, and two granite quarries, all under operation at the present time.

Municipal Railways of San Francisco, San Francisco, Cal.—A contract for the connection of the Market Street and Van Ness Avenue section with the Sixteenth and Church Streets section has been let to the Western Motor Draying Company, San Francisco, by the Board of Public Works, for $74,431.

Chicago & Joliet Electric Railway, Joliet, Ill.—This company reports that it expects to renew considerable track work during the coming season on account of paving to be done by the City of Joliet. The company has sufficient materials on hand for this work.

Quincy (Ill.) Railway.—New improvements planned by the Quincy Railway for this year include the building of loops at the ends of several lines, including the Soldiers' Home, Tenth Street, Broadway and the Depot Lines. The company will also lay new ties, repair tracks generally, lay new pavement and make improvements to the roadbed.

***Fruitdale, Ind.**—The construction of an electric railway from Fruitdale to Brownstown, via Nashville, is contemplated. W. J. Davis, chief engineer of the Tipton-Frankfort Traction Company, Tipton, is reported interested.

Orleans-Kenner Electric Railway, New Orleans, La.—Construction will soon be begun by the Orleans-Kenner Electric Railway of its proposed extension from Kenner to Rost, about 6 miles.

Bay State Street Railway, Boston, Mass.—As the result of a conference between Mayor Benson, City Solicitor Chaple of Salem, and James F. Jackson, counsel for the Bay State Street Railway, it was announced that the bill providing for a two years' extension of time in which the Bay State Street Railway must put certain of its wires under ground in Salem has been withdrawn by the company. The city officials have agreed, through the Mayor, to allow the road another year in which to comply with the law requiring them to remove their overhead wires in the business district of the city. In return for this concession, the company will remove its tracks from Charter and Federal Streets within a reasonable time. The City Council has endorsed the action of the Mayor.

Worcester (Mass.) Consolidated Street Railway.—This company will extend its tracks in Shrewsbury and Albany Streets, Worcester.

Kansas City (Mo.) Railways.—Bids will soon be asked by the Kansas City Railways for extensions as follows: Troost Avenue, from Forty-eighth to Fifty-fifth Streets, the estimate on which is $77,000; Thirty-ninth Street, the estimate on which is $64,000; Indiana Street, the estimate on which is $63,000; Twenty-seventh Street, the estimate on which is $25,000. The company has completed excavating on Thirteenth Street, Kansas City, Kan., and Littlefield, Fry & McGovern have begun work under their contract for the extension on Twenty-fifth Street, from Grand to Troost Street.

Southwest Missouri Railway, Webb City, Mo.—This company is now constructing an extension from Galena to Baxter, about 9 miles.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has recently awarded an order for special work to the Ramapo Iron Works, New York, consisting of frogs and switches to be used on the elevated portions of the Pelham Park extension of the Lexington Avenue subway. The contract price was $41,801. The commission has also under consideration, awaiting award, three bids on another portion of special work for use in the Eastern Parkway subway, in Brooklyn, on which the lowest bidder is the Bethlehem Steel Products Company, New York, whose figure was $34,136.

Cincinnati, Dayton & Toledo Traction Company, Hamilton, Ohio.—This company will relocate its track to conform to the proposed improvement of Hamilton Pike, a part of the Dixie Highway.

Oklahoma & Northern Traction Company, Bartlesville, Okla.—The W. K. Palmer Company, Kansas City, Mo., engineers for the Oklahoma & Northern Traction Company, reports that arrangements are substantially completed for the north division of this system, consisting of lines from Miami, Okla., to Columbus, Kan., with a branch to Baxter Springs, Kan., which will probably be continued to Galena and into the city of Joplin. The south division consists of a line west from Miami to Bartlesville, Okla. Engineering locations and surveys are completed. Plans and specifications and estimates are ready and arrangements for the construction funds have been made for the north division. It is expected that contracts will be let shortly. [Feb. 24, '17.]

Sand Springs Railway, Tulsa, Okla.—This company, which operates a part steam and part electric railway between Tulsa and Sand Springs, will soon let contracts for an extension from Sand Springs to Hominy, and thence to a point on a proposed extension of the Atchison, Topeka & Santa Fe Railway. The grading, bridging and concrete work will be let by contracts, but track laying and other work preparatory to operation will be done by the company's own forces.

St. Thomas (Ont.) Street Railway.—The City Council of St. Thomas plans to construct an extension of the street railway line to Queen and Center Streets.

Southern Pacific Company, Portland, Ore.—It is reported that this company proposes to construct a new steel bridge at Oregon City, at a cost of about $14,000.

Altoona & Logan Valley Electric Railway, Altoona, Pa.—A report from this company states that it expects to construct a 1½-mile extension during the summer.

***Derry, Pa.**—Surveys have been made and work will soon be begun on the construction of an electric railway from Derry to Blairsville, via Millwood, Hillside and Ridgeview Park. It is stated that the line will connect with the Indiana County Street Railway at Saints Rest. Robert Doty, Derry, is interested.

Shamokin & Mount Carmel Transit Company, Mount Carmel, Pa.—It is reported that this company contemplates the construction of an extension from Centralia to Ringtown and thence to Shenandoah, about 14 miles.

Philadelphia, Pa.—Work on the Frankford elevated line of the city's new high-speed transit system has been resumed. The superstructure is completed to Ontario Street, and work has been begun there. Work was stopped in December last because weather conditions would not permit the laying of concrete bases on which the supporting columns of the L structure rest. This concrete work, for which Vare Brothers have contracts, will be begun at once, and the McClintic-Marshall Company, contractors for the structural steelwork, have notified Director Twining of the City Transit Department that they will resume the erection of steel column supports by April 2.

Rhode Island Company, Providence, R. I.—This company will double-track its line on Chalkstone Avenue, from Smith Street to Lisbon Street, this spring.

***Ship Channel Transportation Company, Houston, Tex.**—This company has been organized with a capital stock of $60,000 to construct an interurban line from Houston to Goose Creek. Ed Kennedy, Houston, and L. B. Mitchell, Chicago, are reported interested.

Virginia Railway & Power Company, Richmond, Va.—In connection with its rerouting at Richmond, the Virginia Railway & Power Company is building 2 miles of additional track, chiefly in double-tracking. As part of existing track is being removed, the net increase is only 1 mile. The company is also reconstructing 6000 ft. of single track. The rail for these jobs consists of new 116-lb., 7-in. Lorain section 434, or reused 107-lb., 9-in. Pennsylvania section. All work is on white oak in crushed-stone ballast and concrete paving.

Seattle (Wash.) Municipal Railway.—The Council of the city of Seattle has under consideration the construction of an extension of the Seattle Municipal Railway from Nickerson Street and Thirteenth Avenue to the north city limits in Ballard and the acquirement of common-user rights on Fourth Avenue between Stewart Street and Jefferson Street.

Capital Interurban Company, Milwaukee, Wis.—The Wisconsin Railroad Commission has dismissed the petition of the Capital Interurban Company for a permit to construct a line from Blooming Grove to Janesville. Gustav Pickhardt, Milwaukee, president. [July 29, '16.]

SHOPS AND BUILDINGS

Connecticut Company, New Haven, Conn.—Work will be begun within a month by this company on the construction of its new carhouse at Waterbury. The structure will be of the latest and most approved type of carhouse, and the present buildings will be razed to make way for the construction. The layout of the tracks in front of the building will be changed so as to eliminate all exterior switching. The switching, with the completion of the carhouse, will be done on the inside.

Pekin City (Ill.) Municipal Railway.—Work will soon be begun by the Pekin City Municipal Railway on the construction of an addition to its carhouse.

Hagerstown & Frederick Railway, Hagerstown, Md.—The carhouse of the Hagerstown & Frederick Railway at Virginia Avenue and Howard Street, Hagerstown, containing nine cars, was recently destroyed by fire. The loss is estimated at $50,000.

Interborough Rapid Transit Company, New York, N. Y.—Plans have been prepared by the Interborough Rapid Transit Company for the construction of a new carhouse to be erected in the Long Island Railroad yards, a short distance from the terminal of the Queensboro tunnel at Hunterspoint Avenue. The carhouse will be used for cars operated in the subway between the Grand Central Terminal, Manhattan, and the elevated lines in Long Island City.

POWER HOUSES AND SUBSTATIONS

Birmingham Railway, Light & Power Company, Birmingham, Ala.—Within the next few months this company plans to install three new 1000-kw. rotary converters, the output of which will be sold to the Birmingham, Ensley & Bessemer interurban lines.

Capital Traction Company, Washington, D. C.—An order has been placed by the Capital Traction Company with the Electric Storage Battery Company for a sixty-four-cell chloride accumulator to furnish exciter current at its Georgetown power plant. It has also ordered two small substation batteries from the U. S. Light & Heating Company.

Athens Railway & Electric Company, Athens, Ga.—This company reports that it is installing a 2000-kw. turbine.

Chicago, Ottawa & Peoria Railway, Ottawa, Ill.—This company is overhauling and reequipping its power plant at La Salle at a cost of $200,000. The plant is being enlarged and new machinery is being installed. This plant will be used as an auxiliary whenever the power fails at Marseilles because of high water or clogging of the gates with anchor ice. Both the La Salle and Ottawa plants are held in reserve to answer emergency purposes.

Ottumwa Railway & Light Company, Ottumwa, Iowa.—Preparations are being made for improvements to the power plant of the Ottumwa Railway & Light Company, including the installation of a 1250-kw. turbo-generator and auxiliaries.

Eastern Wisconsin Electric Company, Grand Rapids, Mich.—This company has purchased a 7500-hp. steam turbine and auxiliary equipment at a cost of about $150,000.

Columbus Railway, Light & Power Company, Columbus, Miss.—This company has recently overhauled both its gas and electric light plants, having installed modern machinery and equipment.

Butte (Mont.) Electric Railway.—This company reports that it expects to build two substations of 500 kw. and 1500 kw. capacity.

Manufactures and Markets

Discussions of Industrial Conditions
A Department for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Business Announcements Trade Literature

Purchasing Problems Discussed

Government to Become a Big Factor in Material Market—Embargoes Paralyze Construction Work—Contracts for Material Broken on Account of Car Shortage

By FRANK J. PETURA
Purchasing Engineer, Henry L. Doherty Company

The purchasing problems of the large utility companies are becoming more and more difficult each day with no immediate relief in sight. The possibility of war does not brighten the situation any for the reason that the government which so far has been comparatively a small buyer will now be in the market for enormous quantities of materials. Although the orders for the Allies, many of which were very large, are now about completed, the amount of material needed by this government will be far in excess of that required for shipment to the Allies. If these materials cannot be obtained in the open market, the only course left open to the government would be to requisition whatever is required. Corporations would still continue to operate their plants, but the government would requisition all of the products until further notice. This, of course, would make the situation in regard to raw materials more acute than at present. It is not now a question of price in obtaining materials but one of deliveries.

Prices generally are just about all that the traffic will bear, and in some cases a little bit more. For instance, this company purchases annually 400.000 tons of coal. Before the war this coal, which is usually run-of-mine, or No. 1 slack, was obtained for about $1 a ton at the mine with fairly prompt delivery. However, it is now about $3.50 a ton, and the large coal companies in the Central West are not particular at all whether they make contracts for their output or not. In a number of cases contracts have been canceled by the coal operators on account of the car shortage. If a certain contract calls for 20,000 tons of coal per month, the coal company after delivering 10,000 tons of coal has been known to notify the purchaser that on account of embargoes, car shortage, etc., no further deliveries could be made on contract, but that perhaps half the remaining amount would be sold to the purchaser at the current prevailing price which would be considerably in excess of the contract price. Unless the purchaser wanted to take the matter into the courts or to shut down his plants, he had no other recourse than to buy the coal outright at the higher rate. Again, it is almost impossible to make contracts for coal to be delivered at a future date. This company has in the process of construction additions which, when completed, will increase the amount of coal used about 100,000 tons, and this makes the fuel supply problem all the more difficult.

EMBARGOES HOLD UP CONSTRUCTION WORK

That construction work is being paralyzed by the embargoes recently placed into effect on many of the railroad lines is shown by the following illustration. All the railroads entering Warren, Ohio, recently had an embargo placed on them. In order to complete a boiler installation it was necessary for this company to use two carloads of firebrick which were en route from a nearby point in Kentucky. As the terminal lines refused to accept these cars the work had to be shut down until other arrangements could be made to get the firebrick delivered, and the completion of the power plant was delayed considerably. In addition to furnishing the railway load in Toledo, Ohio, energy is also furnished to the Overland automobile factory. The Overland people, however, are unable to ship the completed machines in standard cars, and if they were unable to get flat cars, production would probably be curtailed and the power company's load would fall off.

At the present time any kind of electrical equipment is in great demand, and about twenty months' delivery is the best that can be had on turbines of more than 2000 kw. For the smaller units, the General Electric and Westinghouse are quoting about fourteen or fifteen months, while the Allis-Chalmers is able to make delivery in eight or nine months. As it takes three months to build a turbine of this small size, it is evident that the companies are merely taking orders and perhaps do not commence actual work on the turbine for nearly a year after they have received the order. Formerly boilers ordered from Babcock & Wilcox Company, the Connelly Company, or from the Bigelow-Hornsby people could be obtained in ninety days, but six to seven months is the best that can be expected at the present time, on account of the scarcity of the seamless tubing and plates used in making the water tubes. These products have increased 150 per cent in value, and are not available even at that price except for long deliveries. Tubing of this kind is used in making shells and the munitions people have had their orders placed well in advance of the other lines.

It is generally believed that the manufacturers are making enormous profits off of some of their products, but the truth is that they are not making nearly as much as the prices would indicate. The raw material manufacturers, producers and middlemen are making the enormous profits.

CONDITIONS AFTER THE WAR

Anything that can be said regarding the conditions after the war is merely a guess. I believe, however, that there will be a big reaction and that labor conditions will be very unsettled. Our present trade without competition will have plenty of competition after the war. For instance, pig iron at the present time is selling for $38 a ton. With the mines working at an over-load capacity in Europe they will easily be able to cut this price in two. This may not only cut off the exports from this country, but cause a decrease in our domestic trade. Again, the foreign governments have power to fix prices, and this will tend to make American manufacturers sell their products at much less than they are now being sold in order to compete with the foreign market.

Loose-Leaf Literature vs. the Big Catalog

BY ALLEN BOND
Advertising Manager Ohio Brass Company

I have read with considerable interest the article on uniform catalog size on page 372 of your issue of Feb. 24, and the comments on page 467 of the issue of March 10. There is no doubt but that a standard size catalog is to be desired for several reasons, both on the part of the buyer and the seller. However, it is doubtful if one size of catalog can be selected as suitable for all the different classes of products that are used in the industry. If two or three sizes are adopted as standard, any manufacturer will be able to adapt his publications to one of these sizes.

The loose-leaf catalog is fine in theory, but it does not work out satisfactorily in practice. Among the recipients of manufacturer's catalogs, a considerable percentage has no office organization that makes it a practice to properly file loose-leaf material as it is received from the manufacturer and as a consequence much loose-leaf material sent out fails to reach the proper file and is lost.

Better a solidly-bound catalog that is known to be six months or a year old than a loose-leaf affair whose up-to-dateness is unknown to either the owner or the manufacturer that supplied it.

International Commercial Outlook

According to O. P. Austin, Statistician of the National City Bank, international trade after the war will be about the same as before the war. There seems little reason to believe that nations now at war with each other will prolong the struggle after peace has been declared into an industrial war. Statistics show that after all great struggles trade between the warring nations was greater than before the struggle. Furthermore, there is no good reason to believe that European buyers are going to buy anywhere but in the most favorable markets. It is evident, therefore, that there is little occasion for American manufacturers to believe that after the war German markets will be closed to English and French goods and that English, French and Russian markets will be closed to German and Austrian goods.

Furthermore, statistics show that so far as labor is concerned Europe is in a better position to-day, and will be after the war, to make progress industrially than before the war. The net increase in male population of the countries now at war is greater than the number of males killed or maimed to an extent to be unfit for industrialism.

There is little likelihood that the destruction of vessels will in any way curtail foreign trade after the war is over, for according to the latest estimate, only about 10 per cent of the world's tonnage has been destroyed so far, while the production of new ships in the meantime has been fully half as much as the tonnage of those destroyed, so that the net loss it may be assumed is not more than 5 per cent. With this loss distributed all over the world, it is not likely to prove of much account in post-war trade.

A Disturbing Factor in Car Building

Prominent Car Builder Points Out That Pullman Company's Bids for Car Building Are Made on a Non-Commercial Basis

The acceptance by the Interborough Rapid Transit Company, New York, of the Pullman Company's bid for 377 motor car and 140 trail car bodies (noted on page 529 of the March 17 issue of the ELECTRIC RAILWAY JOURNAL) naturally has aroused considerable comment in electric railway circles. The fact that the Pullman Company could underbid electric railway car builders by margins ranging from $295 to $1,125 was a cause of astonishment to those unfamiliar with the conditions. The following comment from a leading car builder on the situation should prove of interest in this connetcion.

The Pullman Company, he points out, is organized primarily to operate cars built in its own shops. When its facilities are not drawn upon heavily for its own work, it seeks miscellaneous business in the steam field and large orders in the electric field. Its facilities for manufacturing economically are no better than those of most electric car builders. Furthermore, the Interborough contract was taken subject to contingencies in the delivery of material which proves that the Pullman Company also had to figure on buying material at current market prices.

The only reason, then, why the Pullman Company can underbid the electric car builders is that it makes no perceptible allowance for profit or overhead. Its price covers little more than labor and material. A careful audit of the Pullman books would probably show that the company makes no money from manufacture, whereas it does make large profits from operation. In other words, the benefits that accrue to a Pullman client here and there come out of a charge on the general public.

While the individual electric railway can hardly be censured for buying in the cheapest market, there is no question that competition of this kind is highly demoralizing. In the present state of the electric car business, the division among four or five builders of an order like the Interborough's would have proved a splendid stabilizer for the industry. By giving such orders to an outsider who insists upon an all or none policy, the legitimate car builder is not only deprived of business, but placed in a false position as to price when soliciting smaller orders from railways which the Pullman Company does not care for.

Metal Tickets for Several Properties

A Saving in Ticket Cost Is Gained and Complete Registration Is Easily Possible

The use of metal street-car tickets is not new, but at this time their popularity seems to be growing rapidly. The Johnson Fare Box Company of Chicago has on hand a number of orders for such tickets. They are in use in Evansville, Ind.; Mobile, Ala., and Racine, Wis., and the United Railways of St. Louis recently ordered 200,000 of them. By the use of metal in place of paper, it is possible to give a registration and a bell for every fare received. Transfers are rung on a separate register.

The metal tickets used in the cities mentioned are being used in connection with the Johnson fare box, but the standard size 5-cent metal ticket is suitable for registration in any fare box. Some of the properties in addition to the 5-cent fare, have special-size metal tickets for passes, for low-rate fares and for school tickets. In Mobile the boxes separately register four classes of fares, each class having its own totalizing indicator.

The metal tickets are made of German silver, are hard, and will last for years. They are engraved with a geometrical design, and by means of dies a large identification letter is silhouetted in the center of each ticket. The metal used for the tickets is so hard that a cutting die is said to last for but 50,000 impressions. These tickets can be resold many times, and thus the final cost is much lower than that of paper tickets.

CURRENT PRICES FOR MATERIALS

Quoted Wednesday, March 29

Copper (electrolytic)	New York,	35½ cents per pound
Rubber-covered wire (base)	New York,	42 cents per pound
No. 0000 feeder cable (bare)	New York,	42 cents per pound
No. 0000 feeder cable (stranded)	New York,	39¾ cents per pound
No. 6 copper wire (insulated)	New York,	39½ cents per pound
No. 6 copper wire (bare)	New York,	42 cents per pound
Tin (straits)	New York,	55⅞ cents per pound
Lead	New York,	9½ cents per pound
Spelter	New York,	10¾ cents per pound
Rails, A. S. C. E., O. H	Mill,	$40 per gross ton
Rails, A. S. C. E., Bess	Mill,	$38 per gross ton
Wire nails	Pittsburgh,	$3.20 per 100 pounds
Railroad spikes, 9/16 in. and larger	Pittsburgh,	3.65 cents per pound
Steel (bars)	Pittsburgh,	3¾ cents per pound
Sheet iron (black, 24 gage)	Pittsburgh,	4.85 cents per pound
Sheet iron (galv., 24 gage)	Pittsburgh,	6.55 cents per pound
I-beams over 15 in	Pittsburgh,	10 cents per pound
½-in. galv. extra high strength steel wire,	New York,	$7.04 per 100 ft.
⅜-in. galv. high strength steel wire	New York,	$3.52 per 100 ft.
⅜-in. galv. Siemens-Martin wire	New York,	$2.60 per 100 ft.
5/16-in. galv. Siemens-Martin wire	New York,	$2.00 per 100 ft.
Galvanized barb wire and staples	Pittsburgh,	4.05 cents per pound
Galvanized wire (ordinary)	Pittsburgh,	3.85 cents per pound
Cement (carload lots) with rebate for sacks,	New York,	$2.02 per barrel
Cement (carload lots)	Chicago,	$2.06 per barrel
Cement (carload lots)	Seattle,	$2.60 per barrel
Sand in large lots	New York,	50 cents per ton
Waste, No. 1 white	New York,	14 cents per pound
Linseed oil (raw, 5-bbl. lots)	New York,	$1.01 per gallon
Linseed oil (boiled, 5-bbl. lots)	New York,	$1.02 per gallon
White lead (100-lb. keg)	New York,	10¼ cents per pound
Turpentine (bbl. lots)	New York,	45 cents per gallon

OLD METAL PRICES

Copper (heavy)	New York,	29 cents per pound
Copper (light)	New York,	24¾ cents per pound
Red brass	New York,	20 cents per pound
Yellow brass	New York,	19 cents per pound
Lead	New York,	8 cents per pound
Zinc		8 cents per pound
Steel car axles	Chicago,	$38 per net ton
Iron car wheels	Chicago,	$22 per gross ton
Steel rail (scrap)	Chicago,	$27.50 per gross ton
Steel rail (relaying)	Chicago,	$34 per gross ton
Machine shop turnings	Chicago,	$9.50 per net ton

Signals for Illinois Traction

The Illinois Traction System is planning the installation this summer of 20 miles of track-circuit controlled automatic block signals, using the Union Switch & Signal Company's style B mechanism, and the Illinois Traction standard control circuits. With this 20-mile additional protection, the Illinois Traction System will have approximately 200 miles of track under block-signal control. The material for this installation, which will be located near Edwardsville, Ill., has been on order for some time. The work of installation will be under the charge of John Leisenring, superintendent of signals and overhead, Illinois Traction System, Springfield, Ill.

Branding Treated Lumber

One of the features of the annual convention of the American Wood-Preservers' Association, which was held recently in New York, was the manner in which the association took up the problem of branding treated lumber. Companies treating lumber were urged to brand their creosoted or otherwise treated timber and then to advertise their brand extensively. This is part of a national movement for the branding of products in order that the consumer may secure a guaranteed quality. The cypress manufacturers have already started branding their lumber, only members of the association being authorized to use the brand, thus placing the entire association back of the quality of lumber sold by members. The only difficulty in the way of making this a universal practice has been to secure an effective machine to brand each end of every piece of timber manufactured.

ROLLING STOCK

Columbus (Ohio) Railway & Light Company are reported to be in the market for ten city cars.

Hagerstown & Frederick Railway, Frederick, Md., is reported to have lost nine cars in a fire which caused a total damage of about $50,000.

Oklahoma Union Traction Company, Tulsa, Okla., are preparing specifications for seven one-man and three interurban cars.

Carbon Transit Company, Mauch Chunk, Pa., lost five summer cars in a fire which recently destroyed its carhouse in Upper Mauch Chunk.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has ordered twenty Peter Witt cars from the G. C. Kuhlman Company.

Stone & Webster Management Association, Boston, Mass., noted in last week's issue as being in the market for twenty-four double-end, one-man cars for its Bellingham and Tacoma properties, has placed the order with the American Car Company.

Illinois Traction System, Peoria, Ill., has on order with the St. Louis Car Company forty-four city cars to be distributed as follows: Fifteen to Wichita, three to Atchison, six to Oskaloosa, two to Ottawa, and eighteen to Peoria. In addition, one interurban car was ordered for the main line of the system.

Wilmington & Philadelphia Traction Company, Wilmington, Del., noted in the ELECTRIC RAILWAY JOURNAL of Feb. 24 as reported to have purchased ten cars from the J. G. Brill Company, have specified the following details for this equipment:

Number of cars ordered	15
Date of order	Feb. 27, 1917
Date of delivery	July, 1917
Builder of car body	Brill
Type of car	Semi-convertible
Seating capacity	44
Weight (total)	30,600 lb.
Bolster centers, length,	17 ft. 6 in.
Length over bumpers	41 ft.
Length over vestibule	40 ft.
Width over all	8 ft. 4 in.
Rail to trolley base	11 ft. 4 in.
Body	All steel
Roof, arch or monitor	Arch
Air brakes	General Electric
Control type	K
Door operating mechanism	Brill
Motors	4 G.E.-258
Motors	Inside hung
Seats, style	Brill reversible
Seating material	Rattan
Trucks, type	Baldwin Arch Bar
Wheels	26-in. cast iron

Wheeling (W. Va.) Traction Company, noted in the ELECTRIC RAILWAY JOURNAL of Feb. 17 as ordering fourteen prepayment car bodies from the Jewett Car Company, has specified the following details for this equipment:

Type	Low floor—end entrance
Seating capacity	52
Weight (total)	38,000 lb.
Bolster centers, length	22 ft. 0 in.
Length over bumpers	49 ft. 0 in.
Length over body	34 ft. 0 in.
Width over all	8 ft. 10 in.
Rail to trolley base	10 ft. 9 in.
Body	All steel
Interior trim	Cherry
Headlining	Agasote
Roof, arch or monitor	Arch
Air brakes	Westinghouse
Axles	Heat treated
Bumpers	Rico anti-climber
Control, type	K
Couplers	Tomlinson automatic
Curtain fixtures	Fabrikoid
Curtain material	Ring fixture
Designation signs	Hunter
Door mechanism	Nat'l pneumatic
Fare boxes	International R-5
Fenders	H.B. life guards
Gears and pinions	Nuttall
Hand brakes	Peacock
Heaters	Truss Plank
Headlights	Crouse Hinds
Journal boxes	Symington
Lightning arresters	West.
Motors	4 West. No. 532
Motors	Inside hung
Seats	Hale & Kilburn, No. 300
Seating material	Rattan
Step treads	Feralun
Trolley retrievers	Knutson
Trolley base	U. S. 14
Trucks, type	Baldwin, Type K
Ventilators	Jewett Car Company
Wheels	Davis 26 in.

Montreal Tramways, Montreal (Que.), Canada, noted in the ELECTRIC RAILWAY JOURNAL of March 10 as being in the market for fifty cars, has placed this order with the J. G. Brill Company.

Cleveland Southwestern & Columbus Railway, Cleveland, Ohio, noted in the ELECTRIC RAILWAY JOURNAL of Dec. 23, 1916, as ordering six interurban cars from the G. C. Kuhlman Car Company, has specified the following details for these cars:

Type of car	Single-end, steel frame, smoking and pass. interurban cars
Seating capacity	78
Weight (total)	52,150 lb.
Bolster centers, length	36 ft. 0 in.
Length over bumpers	61 ft. 6 in.
Length over vestibule	60 ft. 6 in.
Width over all	8 ft. 6 in.
Rail to trolley base	12 ft. 6½ in.
Body	All steel
Interior trim	Statuary bronze
Headlining	Agasote
Roof, arch or monitor	Arch
Air brakes	Westinghouse
Axles	Brill
Bumpers	Kuhlman
Car trimmings	Kuhlman
Conduits and junction boxes,	West. steel conduit junction boxes.
Control type	Westinghouse H-L.
Curtain fixtures	Curtain supply
Curtain material	Pantasote
Designation signs	Ry. standard
Door mechanism	Nat'l pneumatic
Fenders	Providence
Gears and pinions	Westinghouse
Hand brakes	Kuhlman
Heaters	Peter Smith
Headlights	Crouse-Hinds Luminous-Arc
Journal boxes	Brill MCB
Lightning arresters	West.
Motors	West. 548-C.
Motors	Outside hung
Paint	Sherwin-Williams
Registers	Ohmer Fare Register
Sanders	Nichols-Lintern
Sash fixtures	Brill Renitent
Seats, style	Brill pressed steel
Seating material	Green Chase "X" plush (pass.), black Pantasote (smokers)
Springs	Brill
Step treads	Mason or Universal
Trucks, type	Brill 27-MCB-3-X
Ventilators	American Automatic
Wheels	37-in. rolled steel

International Railway, Buffalo, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of Jan. 27 as being in the market for fifty cars, has specified the following details for this equipment:

Number	50
Date of order	Feb. 15, 1917
Date of delivery	Aug. 1, 1917
Builder	Kuhlman
Type	Peter Witt
Seating capacity	56
Weight (total)	36,000 lb.
Bolster centers, length	24 ft. 6 in.
Length over bumpers	50 ft. ¼ in.
Length over vestibule	49 ft. ¼ in.
Width over all	8 ft. 2 in.
Rail to trolley base	11 ft. 2 in.
Body	Steel
Interior trim	Natural cherry
Headlining	Nevasplit
Roof	Arch
Air brakes	Westinghouse
Axles	4¾ in. AERA Standard
Bumpers	Rico anti-climber
Car trimmings	Kuhlman
Control	K-11 not pneumatic
Couplers	Brill
Curtain fixtures	Curtain Supply
Curtain material	Pantasote
Designation signs	Hunter Ill.
Door mechanism	Nat'l pneumatic
Fenders or wheelguards	HB
Gears	Columbia Machine Co.
Handbrakes	Peacock-National
Heaters	Peter Smith
Headlights	Golden Glow
Journal boxes	Brill
Lightning arresters,	Shaw insulator
Motors	2 GE 57-2 turn
Motors	Outside hung
Paint	Acme white lead
Varnish	Kay & Ess
Sanders	West. Type C
Sash fixtures	Kuhlman
Seats, style	Brill
Seating material	Cane
Springs	Brill
Step treads	Feralun
Trolley catchers or retrievers	QP
Trolley base	U. S. No. 14
Trucks, type	Brill 39-E-2
Ventilators	Nichols-Lintern
Wheels	33 in. and 22 in. American Car & Foundry
Special devices, etc.	Nichols-Lintern selector switches for lighting

TRADE NOTES

Ohio Brass Company, Mansfield, Ohio, announces that it has received an order from the Boston Elevated Railway for 4800 trolley ears.

Gold Car Heating & Lighting Company, New York, N. Y., has received an order for fifty thermostatic control and electric heater equipments from the Public Service Railway, Newark, N. J., to be used on the fifty cars being built by the Cincinnati Car Company. This makes a total of 180 equipments in use by this company.

Edwin G. Hatch, consulting engineer, New York City, is arranging to have a large quantity of nickel-steel turbine buckets manufactured in this country for the South African plant of the Victoria Falls & Transvaal Power Company, Ltd. These buckets were originally supplied by the Allgemeine Elektricitäts Gesellschaft of Germany.

Vanadium-Alloys Steel Company, Pittsburgh, Pa., announces that arrangements have been completed whereby the following firms will represent the company in the sale of its high-speed and alloy and carbon tool steels: E. T. Ward's Sons, 44 Farnsworth Street, Boston; Geo. Nash Company, 304 Hudson Street, New York; Field & Company, Inc., 721 Arch Street, Philadelphia, and Geo. Nash Company, 646 Washington Boulevard, Chicago.

Edison Lamp Works of the General Electric Company, Trenton, N. J., has under construction a four-story reinforced-concrete addition to its plant on Sussex Street, 135 x 193 ft., estimated to cost $300,000. The company also has had plans prepared for a three-story addition, 93 x 152 ft., to its plant in the vicinity of Ampere, N. J., to cost about $100,000.

Willis M. Deming has resigned from the General Electric Company and will spend some time on the Pacific Coast in rest and recreation, for which he has long felt the need. He has been in the service of the General Electric Company for the last twenty-eight years, having entered the employ of the Thomson-Houston Company at West Lynn in 1888. On the evenings of March 8 and 13 he was tendered farewell dinners by his associates of the General Electric Company and other friends in Schenectady.

Holden & White, Inc., Chicago, Ill., announce that they have been incorporated under the Illinois State law and have changed their name from the partnership firm name of Holden & White to that of Holden & White, Inc. They will continue as general sales agents to handle car equipment specialties, such as Perry-Hartman side and center bearings, Anderson slack adjusters, Garland ventilators, Wasson trolley bases, Watson car-lighting regulators and Reliance air sanders. They will also act as Chicago representative for the Drew Electric & Manufacturing Company, Columbia Machine Works & Malleable Iron Company, the Lincoln Bonding Company and the Miller Trolley Shoe Company.

Julian Beggs Signal Company, Terre Haute, Ind., has closed a contract with the Chautauqua Traction Company to equip that company's line between Lowe Avenue at Lakewood and Westfield, an approximate distance of 25 miles, with the Julian Beggs cab signal and train control system. It is expected that the system will be in operation some time during the coming summer. Under the auspices of the Beggs Company, officials of the Chautauqua Traction Company were in attendance at a test made of the train control system at Cincinnati on March 12. The system is installed on 20 miles of the Queen & Crescent Railroad between Erlanger and Christy, Ky., and consists of twenty blocks. The demonstration train consisted of a locomotive equipped with cab signals and three passenger cars.

ADVERTISING LITERATURE

Wayne Oil Tank & Pump Company, Fort Wayne, Ind., has prepared an illustrated leaflet descriptive of its oil tanks and pumps.

Standard Scale & Supply Company, Pittsburgh, Pa., has issued catalog Y-125 on its standard low-charging concrete mixers.

National X-Ray Reflector Company, Chicago, Ill., has issued a bulletin announcing its nationwide campaign for x-ray lighting.

Electric Storage Battery Company, Philadelphia, Pa., is distributing bulletin No. 164, descriptive of its storage batteries for stationary and semi-portable types for railway signal service.

Wendell & MacDuffie Company, New York, N. Y., is distributing in bulletin form a series of reprints, "Better Public Relations," showing how these conditions are brought about by the use of HB. lifeguards and Providence fenders.

Sprague Electric Works of the General Electric Company, New York, N. Y., has issued bulletin No. 41,514 on its type BSS single-phase motors. This is a varying speed motor and is made in sizes up to 7½ hp.

Protective Signal Manufacturing Company, Denver, Col., will shortly move to its new factory which will afford greatly increased manufacturing capacity now demanded by this company's growing business in highway crossing signals and other forms of protective apparatus.

Doehler Die Casting Company, Brooklyn, N. Y., is distributing a carefully prepared and well-illustrated book, the title of which is "Creating an Industry." This book reviews the history of casting metals from the early Egyptian periods up to the present time.

Hess & Son, Philadelphia, Pa., have issued a bulletin on "Epicasitt" for tin, lead or zinc coatings. This new material is a metal powder mixed with a liquid carrier and is applied with a brush. It is used for protecting iron, steel, copper, brass, etc., against rust, corrosion or oxidation.

New Publications

Crane Construction and Safe Practices. National Safety Council Safe Practices Leaflets, No. 4. Council headquarters, Chicago, Ill. Fourteen pages. Price 10 cents.

This leaflet is one of the series mentioned in the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 10, 1917, page 278.

Preliminary Mathematics. By F. E. Austin, professor of electrical engineering, Dartmouth College, Hanover, N. H., published by the author. 172 pages. Cloth, $1.20.

In this little manual Professor Austin has endeavored to explain the principles of elementary algebra in a practical way. There are numerous problems, many of which are solved and in other cases the answers are given.

Alternating Currents. By H. R. Kempe. D. Appleton & Company, New York, N. Y. Seventy-nine pages. Cloth

In this book the elements of alternating currents are explained without the use of hyperbolic functions. It is written for students, and deals principally with the development and application of formulas. Numerous diagrammatic illustrations are given. A large portion of the book is devoted to telephonic transmission problems.

The Co-operative System of Education. By Clyde W. Park, University of Cincinnati. Government Printing Office, Washington, D. C., Bureau of Education, Department of the Interior, bulletin, 1916, No. 37. Forty-eight pages. Paper. Twenty cents per copy.

This is a comprehensive, illustrated description of the co-operative system of education as developed in the College of Engineering of the University of Cincinnati, under the direction of Dean Herman Schneider. Appended to it is a complete bibliography of the co-operative system.

English and Engineering, a Volume of Essays for English Classes in Engineering Schools. By Frank Aydelotte, Professor of English in the Massachusetts Institute of Technology. McGraw-Hill Book Company, Inc., New York. 390 page. Price $1.50.

Under this title Professor Aydelotte has collected twenty-seven essays by prominent writers and has grouped these essays under six heads, namely: writing and thinking, the engineering professor, aims in engineering education, pure science and applied, science and literature, literature and life. Wordsworth, Ruskin, Carlyle, Bennett and Lounsbury are among those quoted. The purpose of this collection is primarily to help technical students to express themselves better in writing and speaking and to broaden their outlook on life. The book is indicative of the greater attention which is being paid to the study of English in our technical schools. While one cannot learn to write simply by reading, reading encourages thinking, and thought is the necessary precedent to interesting writing. The essays seem well selected to give every engineer, old or young, a broader idea of his profession, and to encourage him to impart his ideas to others in clear, concise language.

Engineering of Power Plants.. By Robert H. Fernald, Ph. D.; Whitney Professor of Dynamical Engineering, University of Pennsylvania, and George A. Orrok, M. E., Consulting Engineer, New York, N. Y. McGraw-Hill Book Company, Inc., New York, N. Y. 569 pages. Cloth, $4 net.

The scope of this book is broader than its title indicates. It deals with the transformation and uses of energy, an interesting subject for students and engineers in all branches of the profession. The topics are presented with comparisons and applications from a practical point of view. Cost figures have been given to introduce the commercial side of engineering, a field not emphasized in most engineering courses. The book gives information on the following subjects: Comparative values of fuels; construction, equipment and operation of steam power plants; chimneys; smoke and its prevention; electric generators and power transmission; cost of power; variable load economy; heating systems; gas producers; oil and gas engines; efficiencies and operating costs of different types of power installations; air compressors; refrigerating machinery, and hydraulic power. The book is well illustrated and gives actual operating data in diagrammatic and tabular forms.

Electric Railway Journal

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PROPERTY PROTECTION IN WAR TIME

Although there is some division of opinion as to the need for special means to safeguard public utility property against damage by cranks or German fanatics, now that a state of war with Germany has been recognized, we feel that such provisions should be made by the electric railway industry. The probability of attacks will, no doubt, be remote unless the German government sees fit to make some dramatic display of strength on either side of the ocean. But if this kind of encouragement is lent, the appeal to unbalanced minds may be enough to start upon public utility property generally a series of minor outrages wherein the electric railways may suffer if they are not prepared. The cost of precautions similar to those taken by a number of companies, as outlined on another page, is not heavy, and the consensus of belief is that, after the lapse of one or two months, most of the danger will automatically cease, thus limiting the time during which this special protection must be maintained. In any event, no electric railway should fail to get in touch at once, through its local municipal police, with the federal secret service. Co-operation of this kind has already worked out very satisfactorily in several instances, and it is obvious that by the interchange of information, rather than by independent action, a much closer surveillance may be accorded to misguided employees and others who might be tempted to commit acts of violence because of the international situation.

PROPOSED CINCINNATI ORDINANCE

The long contemplated plan of modern electric railway development for Cincinnati has at last reached its final stage for, as we are describing elsewhere this week, only one more step is required, the favorable vote of the general electorate on April 17. As the period for the revision of the city franchise occurred last year, the opportunity was taken to deal with the entire transportation situation as a whole. Hence the proposed ordinance provides for a rapid-transit line and the interurban entrance so sorely needed in Cincinnati, and it also constitutes a revision of the existing surface franchise. The result is a possibility of unified operation on a scale that would place Cincinnati among those far-sighted American cities which have realized the close connection between transit development and municipal prosperity and growth. In agreeing to the proposed terms of the franchise revision, the company has been very liberal, especially in regard to surrendering control and in retaining a 5-cent fare for the next fifteen years, when many other companies are talking of a 6-cent rate. In view of the fare fixed, the city could not in justice have refused to agree to a preferential for the company to protect its present investment, but the city transit officials are to be commended for the unusual emphasis with which they have supported this feature. We hope that the ordinance will be passed, not simply because an unfavorable vote would destroy absolutely the work of years, but more because it would prevent the city from adopting a program that meets a present need in a constructive and equitable way.

SUPERIOR RIGHTS OF CARS ON STREETS

Although the tremendous increase in the number of automobiles during the last few years has greatly increased street congestion there are some ameliorating conditions, one of which is the growing better recognition of the superior rights on the streets possessed by electric cars. Of course, there is every reason why the cars should have superior rights. Principal among them are the facts that they are bound down to a definite route, that they carry a larger number of persons per square foot of street occupied than any other kind of vehicle, and that they are a public means of transportation. Sight has often been lost of these fundamentals, however, in both municipal ordinances governing street traffic and in judicial decisions. Evidences of the better understanding are given by the general rule that automobiles shall not pass a standing car discharging passengers unless they provide a clearance of 6 or 8 ft., and by the restrictions in many cities on parking automobiles in streets occupied by tracks, especially near corners. One of the latest evidences of the improved condition of affairs is shown in the recently issued traffic regulations of Oakland, Cal., which definitely say that street cars have the right of way over other vehicles at all intersecting highways not controlled by traffic officers, and that in all places drivers shall not "unnecessarily hinder or delay" their operation. Another section of the ordinance prohibits "jay walking," or the cutting of corners by pedestrians. These provisions are logical in view of the constantly growing pressure on our streets and might well serve as a model in other cities.

AN OPPORTUNITY FOR THE PURCHASING AGENT

Never in the history of electric railroading has there been a time when it was more desirable for purchasing agents to get together for conference than it is this year. With the increases in costs of supplies and prices for scrap, the office of the purchasing agent becomes most important. That a number of purchasing agents recognize this situation is shown by the interviews this week in our department, "Manufactures and Markets." If a large enough number of others feel the same way the time is ripe for the culmination of the plan which already has the sanction of the executive committee of the Engineering Association, for the appointment of a committee of and for the purchasing agents of the association membership. Such a committee could do much in the way of arranging for conferences at the annual convention, of studying and formulating the problems of the purchasing department, including the handling of stores, and of interesting the association membership generally in the work of this important department. It is essential that the electric railway purchasing agents' work be related closely to the electric railway industry and in no way can this be do done more effectively than through the association. We have heard some suggestions to the effect that an affiliated association of electric railway purchasing agents might be desirable. This may come in time as a natural outgrowth of the successful work of a special committee, but it seems to us that, for the present at least, as good results can be obtained with much less organization machinery through a vigorous and competent committee. There is no doubt that a committee will be appointed by the association if there is a real demand for it. Let every purchasing agent who wants such a committee appointed write to Secretary Burritt to that effect without delay.

COUNTING THE COST The "high cost of living" scourge has not been at all selective in the matter of victims, and the railways of the country have suffered quite as seriously as anyone else. Labor and materials both have been scarce and costly. Because of these conditions power tools and other time-saving and economy-promoting devices have gained rapidly in popularity. While in most instances there can be no question as to the saving in operating expenses affected by the use of such tools or devices, in the past there has been a tendency on the part of some to overlook the matter of fixed charges. These charges accumulate whether work is being done or not, and where the tool is used but seldom, they may amount to a surprisingly high hourly charge. For example, let it be assumed that the initial cost of a tool is $1,200 and that the fixed charges, interest, taxes, insurance, if any, and depreciation total 15 per cent of the first-cost. On this basis the annual charge would be $180. If the tool were used but ten hours per year the hourly charge would be $18 and important indeed would have to be the job to justify such an expense in addition to the cost of operation. On the other hand, if the tool were used ten hours per day for 300 days of the year, the fixed charges would amount to only 6 cents per hour, a charge that in all probability would be insignificant when compared with the savings affected by the use of the tool. And the economics of the situation are the same whether the tool in question is a derrick or railbonder for the way department, a wheel press for the motive power department or a computing machine for the auditing department. It is with a great deal of satisfaction, therefore, that we note the tendency, as evidenced in several articles written by operating men and published in recent issues of this paper, to put increased emphasis on the matters of correct cost accounting and true economics in connection with the purchase and operation of machine tools and other labor saving devices.

TIME FOR ACTION

The hour has struck, and whatever the next few weeks may bring in heavy weight of military preparations, they are beginning now, and now is the time for the electric railway men to make good on their splendidly patriotic offers of assistance and to help in carrying out the program for aid in mobilization for which the first call was sounded in these columns more than a year ago. As the issue stands to-day the main work in which the electric roads can be of special help is not the immediate moving of large bodies of men, but the quick transportation of small forces and ample material. In the long stretch of broken coast from Eastport to Galveston, there is the utmost need of being able to land rapid-fire guns and their crews promptly, not to repel invasion, but to form a defense against the sneaking U-boats that are about the only immediate source of anxiety on this continent. There is many a quiet cove or estuary along the coast where a hostile craft lying low in the water might lurk, or where a horde of spies could anchor stores of gasoline and provisions to replenish the marauders' supplies. It is of no little importance to be able to place a platoon or so with a rapid-fire gun almost anywhere along the coast to cut off the retreat of men or boat and co-operate with the patrol boats of the navy.

In such skirmishing work as this the electric roads which reach down seaward and run along the coast can be, if properly equipped, of the utmost service, and we hope that this branch of their usefulness will be followed up. For quick getting about the ever-ready motor truck is invaluable, yet an electric car capable of carrying a field piece and its crew can relieve the motors of a heavy task of patrol duty wherever the tracks run. Already there are well-defined rumors of traitorous activities at various points along the shore and of U-boats hanging around under shelter waiting for the time to strike. Many of these rumors are probably baseless, but the chances are that some have a foundation in fact. To the electric railway the need of careful compilations of their resources in cars, power and connections, as planned by the association's committee on national defense, is most important. Long stretches of shore could be well patrolled in this way, leaving to the permanent posts and motor trucks the remainder of the shore local defense. There are many points which must be protected outside the fortified ports, for a good deal of damage can be done to industries within range of the water even by so small a raiding force as a U-boat with a 3-in. or 4-in. gun, and the European experience has shown that the commanders of the aforesaid expeditions are by no means squeamish about their methods of warfare and may be reasonably expected to indulge in wanton destruction of life and property for sheer terrorism. It is up to the railway men to be prepared for this patrol work as well as for the heavier tasks of carrying if necessary large bodies of troops. This means thorough preparation in the way of material for carrying light artillery and its equipment and clearing the way on lines leading to and along the shore, so that on extremely short notice ordinary traffic can be sidetracked and patrol cars started out, a problem somewhat different from the general one of mobilization and consequently requiring study right now.

A CONVENTION OF PUBLICITY MEN

The plan to assemble the publicity men of electric railways at the forthcoming St. Louis convention of the Advertising Clubs of the World is worthy of all support. The art of publicity as yet has few traditions. It is all so new that many people don't know what it really is. Gerald Stanley Lee in his book "We" described it as "helping millionaires to think." Its real purpose is to interpret the corporation to public opinion and to interpret enlightened public opinion to the corporation.

The St. Louis convention will give the men a fine chance to study public opinion, the effective approaches to the popular mind and what the experience of different companies has shown as to the best methods of doing these things. There is such a real community of interest between electric railway companies in all these matters that a frank interchange of experiences should be widely useful.

But the publicity men should go further. They need to know the electric railway business as well as the public. They should, therefore, plan to meet not only at St. Louis but with the executives of the electric railway companies themselves at the annual convention in October. A day or at least a session of that convention should be set apart to discuss publicity and public relations; the speakers should be the publicity men and the executives. That was a most helpful and suggestive discussion which followed Ivy L. Lee's address at the convention last year. There should be a more detailed consideration of this vital problem.

In addition, there might well be an exhibit of publicity material which has been issued by the different companies. Indeed, if a prize could be offered to that company making the best exhibit and report upon its publicity activities, it would probably stimulate a rivalry which would prove both healthy and helpful.

The electric railway public relations problem is so vital and pressing as to demand the earnest and immediate study of every man having the welfare of this industry at heart. Unless the public can see the problems of the industry as they are and meet those problems fairly and constructively, one must take a despairing view of the future. That we do not do. We believe the public is fair; we believe that proper publicity will cure some of the most serious evils now confronting this industry; we intend to support every expedient which will promote that end. Here is an expedient which every company should support. These conventions of publicity men, therefore, will receive all the co-operation which the columns of the ELECTRIC RAILWAY JOURNAL can extend.

THE APPEAL BY THE INTERBOROUGH FOR "HELP"

Some people said it wasn't dignified for the Interborough to request complaints from the public. Others said it was a mistake to suggest that complaints be made, for that would only stir up criticism. Yet others said the appeal for "help" constituted a confession on the part of the company of its inability to do its job.

Just how superficial any such points of view are is indicated by the results of this remarkable bid for popular co-operation, as told on another page. Nothing the company had previously done "caught on" more quickly. Right away, the step disarmed public criticism. It challenged the good-will of everybody. For it was all so human. If a man or an institution maintains an attitude of superiority and aloofness, he won't get much public sympathy. But antagonism melts the moment a man says, "I'm doing all I can, but I know I'm not perfect; tell me of your criticism, and I'll do my best to profit by it." After that it is purely a question of good faith, for the human relationship has been established.

The New York subway and elevated are among the wonders of the modern world—as transportation machines. They carry so many millions of people and carry them so safely and quickly, that the public little realizes the part played by the man behind the machine. Yet that man is just as human, just as real as the man who enjoys the service. The vital need is to get their points of view together, to establish a point of contact, to make them realize their human relationship.

This act of the Interborough was conceived in a fine spirit. Its plan and purpose are well worth the study of other companies, for in them are embodied certain essential features of any effort to cultivate better public relations. The beginning and the end of any campaign for the approval and support of public opinion must be sincerity. And here right at the outset of Interborough's new publicity policy was an act of such obvious candor and sincerity that immediately it won the applause of New York.

A great deal has been said of publicity and the best methods of publicity, but, when all is said and done, what really counts is the spirit of the management. There are many ways of communicating that spirit to the public, but even through very awkward and faulty methods of publicity a spirit of real and earnest desire to serve the public to the best of one's ability is sure to be understood. Once that is understood, the way to public confidence is paved.

Publicity on the Small Road

A Story of Earnest Endeavor Toward Cementing Good Public Relations and the Satisfactory Results Which Followed

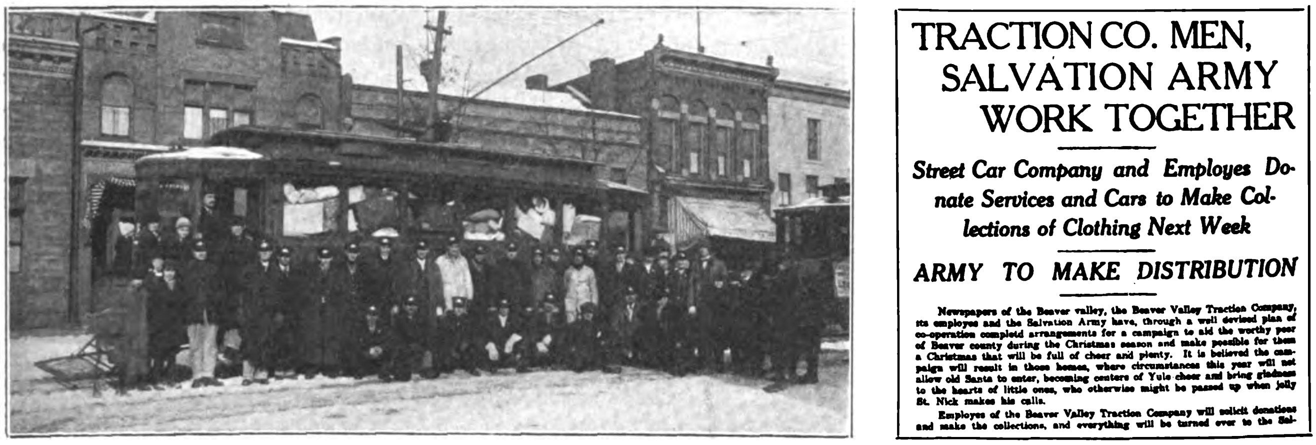
By W. H. BOYCE

Superintendent Beaver Valley Traction Company, New Brighton, Pa.

THE good-will of the public is invaluable, and we as street railway operating officials must ever cultivate it. The question naturally arises by what means can we secure and retain the confidence of the public and what methods must we employ to impress upon its mind the honesty and sincerity of our purposes?

PUBLICITY IS THE ANSWER

In effecting publicity we have learned that there are many ways other than the printed page to acquaint the public with the guiding purposes and ideals of the officers of this company and the esteem in which its good-will and understanding is held by them. It is not with egotism nor even with a pardonable pride that the writer records his experiences but rather in the hope that his ventures of proved worth may at some future date be the means of smoothing over some of the rough places for other operating officials.



TRACTION CO. MEN, SALVATION ARMY WORK TOGETHER

Street Car Company and Employes Donate Services and Cars to Make Collections of Clothing Next Week

ARMY TO MAKE DISTRIBUTION

Newspapers of the Beaver valley, the Beaver Valley Traction Company, its employes and the Salvation Army have, through a well devised plan of co-operation completd arrangements for a campaign to aid the worthy poor of Beaver county during the Christmas season and make possible for them a Christmas that will be full of cheer and plenty. It is believed the campaign will result in those homes, where circumstances this year will not allow old Santa to enter, becoming centers of Yule cheer and bring gladness to the hearts of little ones, who otherwise might be passed up when jolly St. Nick makes his calls.

Employes of the Beaver Valley Traction Company will solicit donations and make the collections, and everything will be turned over to the Sal-

PUBLICITY ON SMALL ROAD—CAR USED AT CHRISTMAS TIME TO COLLECT GIFTS FOR DISTRIBUTION BY SALVATION ARMY, WITH CLIPPING FROM LOCAL PAPER DESCRIBING THE SERVICE

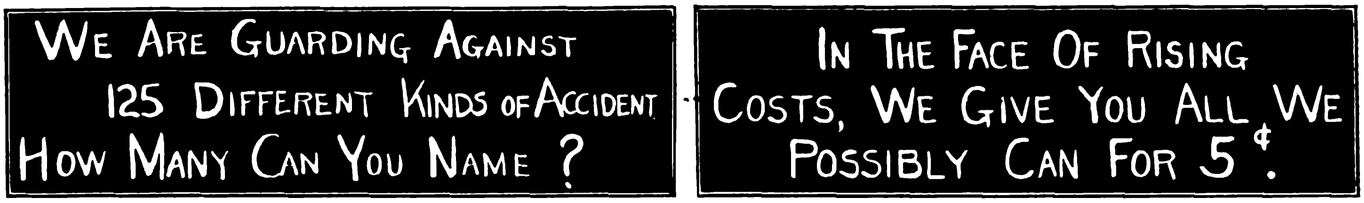
We do not agree with those who contend that publicity work should only be handled by a specialist in that line, for of what profit would it be to a company to employ a publicity agent to maintain one attitude toward the public while its operating officials maintained another? On the other hand, an operating official who does conscientiously have the proper attitude toward the public can and must remove all doubt and suspicion and arrive at some common ground on which he and the people can get together and come to an understanding. This may be through the medium of the press, car cards or tracts, business calls, dinners, theater parties, voluntary visits to borough councils, and other ways. The operating man who has been years on the ground and has not improved and traveled these open avenues has not been true to his superior officers, directors, stockholders, his fellow-townsmen or himself and has only himself to blame for being the non-shock absorbing buffer that he is. A buffer between the public and his company such an official necessarily is, but why not be of the "anti-climb" variety? As complaints, whether verbal, written or printed, must and will have the attention of some responsible official, why have complaints climb and go over your head? There must be ground, either fancied or real, for each complaint made, and unless each and every complainant is at least partly satisfied, he is constantly out with his tools connecting more load, possibly only a few watts here or there, which are not in themselves a menace to any particular circuit, but which will, when thrown on simultaneously, show that you are carrying several amperes over your capacity.

HANDLING COMPLAINTS

When complaints against our trainmen are made by phone or in person we use a special form for recording the information. The face of this blank contains the complaint and the reverse side the result of the dispatcher's investigation and his opinion, formed from the facts gained by his inquiries made of the crew or any person having knowledge of the alleged occurrence. If the complaint is the result of an altercation, the conductor's witnesses are interviewed or written to, provided in our opinion the case warrants such action.

On complaints of inadequate service, the traffic conditions are noted between the points stated in the complaint, not so much to acquaint ourselves with the conditions existing between these particular points, for we aim to keep well informed on such conditions at all points, so as to have the latest data on which to reply to the complainant.

In one instance we had been troubled by a factory employee, who had circulated a petition for better service, on which he had numerous signers, a very easy thing to accomplish under any conditions. More cars were requested from his district at shop closing time. He had a long list of register statements, showing the number of passengers in that fare section for that particular trip for many evenings past. In this particular case the reason for the high register readings was that the cars were picking up a shop load 3 miles beyond the point at which complaint was made, but the greater number of passengers were discharged before reaching the factory in question. But all manner of reasoning



WE ARE GUARDING AGAINST 125 DIFFERENT KINDS OF ACCIDENT HOW MANY CAN YOU NAME?

IN THE FACE OF RISING COSTS, WE GIVE YOU ALL WE POSSIBLY CAN FOR 5¢.

PUBLICITY ON SMALL ROAD—TYPICAL CAR CARDS USED BY BEAVER VALLEY TRACTION COMPANY

could not convince this individual that his register statement traffic check was incorrect, until, finally, we offered to pay him for his time for two or three evenings to accompany a traffic checker to the point complained of and told him that the cars would be stopped and the number of passengers on them counted. One evening was enough for him. He hasn't been around for his pay.

A Reputation for Fair Dealing

Perhaps the most valuable asset an operating official can have is a reputation for squareness. The late J. H. Van Dorn, founder of the great Van Dorn Iron Works, when asked to what he attributed his success, replied, "I play fair and do as I agree." Could anything be plainer? There was never a truer axiom than: "Common sense draws men together. Square dealing holds them together." Generally speaking, one is not in the habit of "warming up to" or placing confidence in those whom he even vaguely feels distrust him. So, in this line of work, we cannot afford to fail to improve every opportunity to better the relations with each patron with whom we come in contact.

We have found that a good place to start fair dealing is with the employees, though not at a sacrifice of discipline. This, above all, is our stock in trade, for if an official is a poor disciplinarian, no matter what his other qualifications, he is lost. It is a good rule to deal with each employee charged with an infraction of a rule regardless of political, social, religious or fraternal relations, but ever to keep in mind the premises in the particular case. If one gives proper consideration to the employee's past record, he will arrive at a fair and just conclusion. Employees know whether the management plays favorites. Regardless of rules, they hold conversations with your patrons daily. They readily recognize, appreciate and advertise absolutely fair treatment. On the other hand, if the treatment is not absolutely fair, a "bond of sympathy" is naturally set up between employees, who have had to face a stormy individual at hearing time, which makes all of the "gang outside" want to know what transpired "on the carpet." And you can imagine the "justice" which the choleric executive gets at this public "hearing." We need not dwell on the effect this has on the force. You can surmise the version to their friends and acquaintances, which they have in all walks of life, as some of us who began our careers upon the platform know.

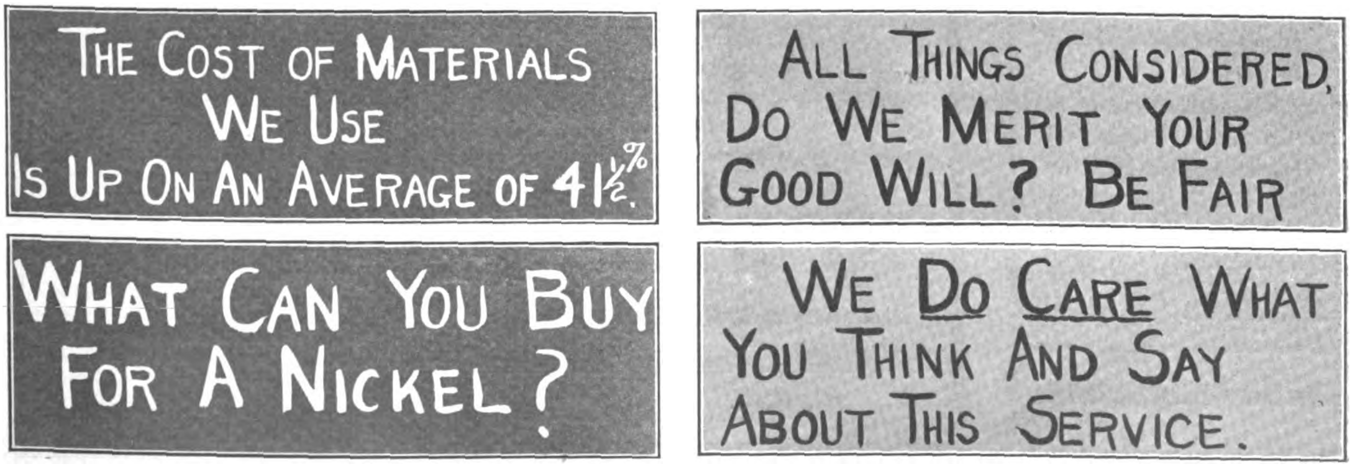
The disciplinarian, who does not lose his temper at a hearing nor attempt to prove his point or coerce by brusqueness or boisterousness, but weighs the facts in calmness, will command respect from all his employees, notwithstanding the disposition which he makes of the case.

Conduct of Publicity

We have not employed a publicity man. The revenue of this company will not permit it. Yet, during the past four years we have changed our advertisements twice each week in each of the three daily papers. We are using regularly a 5 in. double or 10 in. single column space, and, as occasion has demanded, a greater amount. The writing of advertisement, like any other literary work, we find to be dependent upon the mood. If one does not have copy prepared in advance, possibly when the day comes around that the copy in the hands of the printer is exhausted, then the advertisement that is written in haste will prove even to the writer to be very poor in print.

We have prepared and have on hand more than five hundred advertisements, dealing with safety and such general operating conditions and difficulties as do or will from time to time arise on this or any electric railway property. They are classified and deal with the professional politician, the jitney, every-day operating problems and costs, the operating rules, investment, taxes, the fact that electric railways must for the sake of the community and their own existence be dividend payers, and in fact almost every condition except that existing where a franchise is wanted or to offset a 3-cent fare cry.

In our advertising to promote better public relations, we have used copy of the nature of that accompanying this article in the newspapers, on car cards, blotters, thermometers and posters. The newspaper men all understand that at any time they phone this office they can get full and correct information about any accident



THE COST OF MATERIALS WE USE IS UP ON AN AVERAGE OF 41½%.

ALL THINGS CONSIDERED, DO WE MERIT YOUR GOOD WILL? BE FAIR

WHAT CAN YOU BUY FOR A NICKEL?

WE DO CARE WHAT YOU THINK AND SAY ABOUT THIS SERVICE.

PUBLICITY ON SMALL ROAD—TYPICAL CAR CARDS USED BY BEAVER VALLEY TRACTION COMPANY

STEAM RAILROAD FARES HAVE BEEN INCREASED TWICE DURING THE PAST FIVE YEARS IN THIS LOCALITY.

COMPARE OUR FIVE CENT FARE TO THE PASSENGER RATE CHARGED ON PARALLEL STEAM LINES.

WITH BUT HOURLY SERVICE INTERURBAN CAR LINE FARES THROUGHOUT THE COUNTY ARE FROM TWO TO FOUR TIMES THOSE CHARGED ON OUR LINES.

WE ARE DOING EVERYTHING IN OUR POWER TO PROPERLY SERVE THE TRAVELING PUBLIC AT A COST TO US OF FROM 20 TO 100 PER CENT MORE THAN EVER BEFORE, YET YOUR FARES HAVE NOT BEEN INCREASED UP TO THIS TIME.

COULD YOU—WOULD YOU, UNDER LIKE CONDITIONS, FOLLOW A METHOD OF THIS KIND IN THE MANAGEMENT OF YOUR OWN BUSINESS AFFAIRS?

The Beaver Valley Traction Company

For Better Service

If you are an officer in a lodge, school, basketball association, or alumni association or have anything to do with the arrangements for banquets, lectures, or any unusual gatherings, you will confer a favor upon us and those attending your amusements or social functions if will will notify us as to your exact closing hour before 3 P M. on the day of such gathering, and tell us approximately the number of people that you expect, so that we may have extra cars, if necessary, or that we may hold the regular cars a few minutes at the time your people are ready to be transported home.

Beaver Valley Traction Co.

CAR LIGHTING

We adopted as a standard the Masda lamp, which on account of its construction, is necessarily much more fragile than the carbon type of lamp, especially when subjected to the comparatively rough treatment they receive in car service.

Our consumption during the past year was 4397 incandescent lamps. This refinement is for your comfort and convenience, which we have constantly in mind.

The Beaver Valley Traction Co.

PUBLICITY ON SMALL ROAD—TYPICAL NEWSPAPER ADS USED BY BEAVER VALLEY TRACTION COMPANY

that has happened on our lines, any new equipment that we intend to purchase or other contemplated improvements. If we are not ready to have this information made public, we give them an adequate explanation, and we have yet to experience the disappointment of having our confidence violated by any newspaper man in this community.

We are also not unmindful of the facts, that, warm cars in winter, clean, properly disinfected cars, properly maintained rolling stock and roadbed, and adequate service—all make for favorable verbal publicity.

THE RESULTS

During the past four years there have been twelve cases against this company in court. Ten of them were either non-suited or a verdict was rendered for the defendant. Even with publicity this would not be possible except that the cases were properly prepared by our investigation bureau and properly presented and tried by our legal department.

On Sept. 1, 1916, after four months of logically cumulative advertising, we were able to put into effect without any apparent objection, or without any appeal to the Public Service Commission, a new tariff, which abolished books of 100 tickets sold for $4.50, labor tickets which sold at 2½ cents and school tickets which sold at 3¼ cents each, substituting therefore twenty-one tickets for $1.

Decency, accompanied by unbiased consideration of all the rights of others—and advertising *does* pay.

During the year 1916 the Illinois Traction System Hospital Association paid out for hospital and medical services for its members the sum of $26,785. Dues from members during this period amounted to $18,555. The deficit of $8,229 was made good by the company.

A Row With Friend Wife

Ever have a row with "Friend Wife?" Did you continue when you realized you were wrong? Why?

Will you admit that you were not blameless if she admits that she too was at fault?

Now, while you're in that mood—should all blame be placed upon the service or its own portion upon the constantly shrinking nickel?

BE CAREFUL. BE FAIR

The Beaver Valley Traction Co.

WE SAVE YOU TIME

Why Not Assume the Same Attitude Toward Us as to the Trades or Professional Man?

At the popular restaurant you'll wait an hour for a table and think nothing of it. Even then you will tip the head waiter a dollar for keeping you waiting.

IF YOU HAVE TO WAIT A FEW MINUTES ON A STREET CAR YOUR TEMPER IS IMMEDIATELY RUFFLED, THE SYSTEM IS ROTTEN, AND TO YOUR VIEW, THE WORLD IS COMING TO AN END. YOU PAY US A NICKEL—AND ASK FOR A TRANSFER. WE GET NO TIP, WE GET KICKED AND YET GIVE PROMPT AND COMPLETE SERVICE.

THE DOCTOR KEEPS YOU WAITING. OFFER HIM A NICKEL AND SEE WHAT YOU GET—NUX VOMICA WE BET.

THE MANICURIST KEEPS YOU WAITING, SO DOES THE HAIR DRESSER.

THE LAWYER KEEPS YOU WAITING.

THE BARBER KEEPS YOU WAITING.

Everywhere you wait and consider the time well spent and will pay large sums for the privilege of waiting.

WE DON'T WANT YOU TO WAIT ON CARS; WE WOULD LIKE TO HAVE A CAR AT YOUR ELBOW THE INSTANT YOU DECIDE TO RIDE, AND THUS DEMONSTRATE TO YOU THAT SERVICE IS WHAT WE AIM TO GIVE. JUST HOW MUCH SERVICE YOUR NICKEL WILL BUY IS IN DIRECT PROPORTION TO WHAT STATE OF MIND YOU ARE IN AND HOW YOU VIEW OUR EFFORTS.

Sounds Reasonable? Read It Over, Think It Over

The Beaver Valley Traction Co.

IS YOUR HOUSE IN ORDER?

Does the maid always do as she is told?

Does the wife always "obey?"

Do the children ever get tantrums?

Does the furnace ever smoke?

Do the spigots leak?

Does the landlord always promptly make the requested repairs?

Does the newsboy ever fail to leave your paper?

Does the dinner always suit you?

Does every little thing always go just so at your house?

Our system is just a great big wonderful house, wonderful in that so many things go right.

The Beaver Valley Traction Company

Storeroom

Our storeroom records as of Oct. 31, 1916 show that we had in stock car, track and overhead line repair parts in the amount of

$22,687.60

We should be glad to explain to any of our patrons who might call, our method of handling our storeroom supplies, which method might prove helpful to other storekeepers in this territory

THE BEAVER VALLEY TRACTION CO.

PUBLICITY ON SMALL ROAD—TYPICAL NEWSPAPER ADS USED BY BEAVER VALLEY TRACTION COMPANY

Cincinnati's Rapid-Transit Ordinance

Approval of General Electorate Last Step Needed to Accomplish Surface Franchise Revision, Rapid Transit Development and Interurban Entrance—Liberal Concessions Made by Cincinnati Traction Company in Interest of Civic Development

AFTER years of talking, surveying and planning, the citizens of Cincinnati will on April 17 have the opportunity to place their stamp of final approval upon a progressive plan for unified electric railway operation. By one act they can assure the amicable settlement of a franchise revision for the surface system, and open the way for the rapid-transit development and interurban entrance which the city needs. How all these problems can be solved at one time, and how their solution is largely made possible as a result of the very liberal concessions of the surface lines in the franchise revision, will be explained in the following paragraphs.

WHAT THE ORDINANCE PROPOSES

New rapid transit line costing $6,000,000.

Interurban entrance under city approval.

Unified operation of all traction lines.

A 5-cent fare and universal transfers.

City control over service and extensions.

Protection of existing surface investment.

Exchange by city of first money for control.

Surplus earnings divisible between city and company.

Possible acquisition of surface system at agreed price or by condemnation.

Revision of all terms in 1931.

WHY THE FRANCHISE REQUIRES REVISION

In order to understand how it has been possible to arrange such a combined transportation program, it is necessary to recall what has led up to the present situation in each case. To take up the franchise question first, it appears that in 1896 the General Assembly of Ohio passed the Rogers law, authorizing cities to grant extensions of existing franchises for fifty years to street railways that would consolidate under the act. At that time there were several lines in Cincinnati, with no transfers, and all of these, with the exception of lines running over the Ohio River into Kentucky, were consolidated as the Cincinnati Street Railway and received a fifty-year extension upon terms then fixed, including a 5-cent fare, certain specified transfers and some rerouting and extensions.

The State law, however, provided that the terms should be subject to revision by the City Council at the end of twenty years and each fifteen years thereafter, the company at each time having the right of appeal to a court decision based on the cost of transportation then existing. Thus the company was in the peculiar position of having a naked franchise for the limited period of fifty years, but with the terms open to revision at stated intervals. The first or twenty-year period expired on April 22, 1916, since which time the question of revising the terms of the franchise has been under consideration.

Before discussing the rapid-transit situation, it should be explained that in 1901 the owning company, the Cincinnati Street Railway, leased the system to the Cincinnati Traction Company, the present operator, for an annual rental now equal to dividends at 6 per cent upon the lessor's common stock. This lease is for the full term of the existing franchise and all renewals and extensions.

The financing of the lessee company is handled by the Ohio Traction Company, which owns all but a few qualifying shares of the $2,000,000 of Cincinnati Traction Company stock. The lessee company has outstanding $609,000 of equipment notes, but otherwise its financing is represented by the following securities of the Ohio Traction Company: First mortgage bonds, $2,500,000; notes, $1,500,000; 5 per cent cumulative preferred stock, $8,500,000, and common stock, $8,655,000.

INTERURBAN ENTRANCE AND RAPID TRANSIT

Although the territory around Cincinnati is well covered by existing and proposed interurban electric railways, the city has not benefited from interurban traffic so much as have cities like Indianapolis, Cleveland, Toledo, etc., because the interurban entrance into Cincinnati has been restricted, owing to the wide gage of the city lines and the long haul over city tracks for interurbans of the same gage, and because adequate terminal facilities have been lacking. The map on page 634 shows the locations and approximate termini of the various lines. They are listed in the table below.

These ten lines are in operation in Ohio with the exception of the Indianapolis & Cincinnati Traction Company, which has been awaiting a settlement of the question of interurban entrance before building past the Indiana line. All of the remaining nine interurban lines connect with the surface system of the Cincinnati Traction Company, but owing to the fact that the city company has a broad gage, only five lines enter over its tracks, namely: the Cincinnati, Milford & Loveland Traction Company, the three divisions of the Interurban Railway & Terminal Company and the Cincinnati & Hamilton Traction Company. The interurban cars on even these lines, however, are delayed in following the local company's cars.

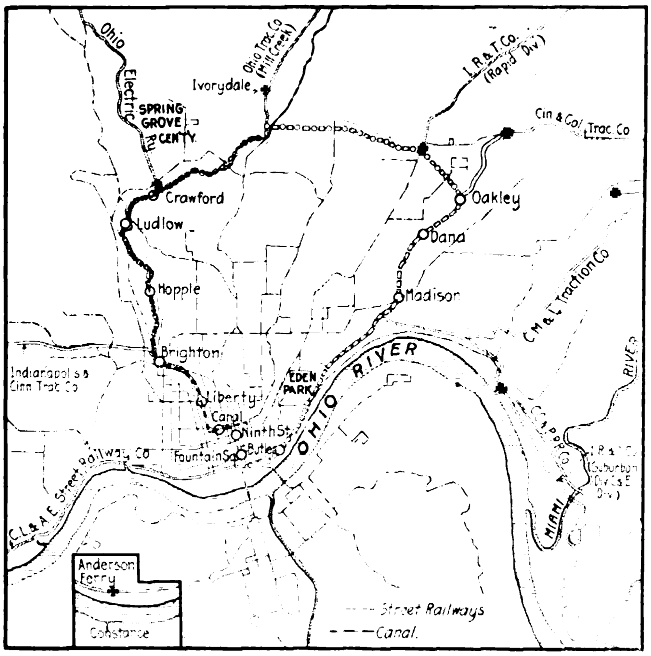
For years the problem of bringing the interurban railways into the city has been discussed. Prior to 1911 four solutions were advanced, but none of them provided for all the interurbans. About this time the question of rapid transit in Cincinnati became linked

INTERURBAN LINES AROUND CINCINNATI

Line	Gage
Cincinnati, Laurenceburg & Aurora Electric Street R. R.	4 ft. 8½ in.
Indianapolis & Cincinnati Traction Company	4 ft. 8½ in.
Ohio Electric Railway	4 ft. 8½ in.
Cincinnati & Hamilton Traction Company (Millcreek Valley Lines)	5 ft. 2½ in.
Interurban Railway & Terminal Company—Rapid Div.	5 ft. 2½ in.
Cincinnati & Columbus Traction Company	4 ft. 8½ in.
Cincinnati, Milford & Loveland Traction Company	5 ft. 2½ in.
Cincinnati, Georgetown & Portsmouth Railroad	4 ft. 8½ in.
Interurban Railway & Terminal Company:	
Suburban Division	5 ft. 2½ in.
Cincinnati & Eastern Division	5 ft. 2½ in.

with that of interurban entrance. The topography of the city is peculiar in that there are few arteries of travel, many steep grades, and narrow streets in the business district, all of which have tended to create congestion and reduce the speed of operation. With the urban population rapidly increasing, the transportation problems have taken on an increasingly serious aspect.

A convenient basis for part of a rapid transit system that would ameliorate traffic conditions and permit interurban entrance was found in 1911 in the form of the section of the unused Miami-Erie canal through the city. It had long been contemplated that this might be used as a boulevard, but when in the year cited the section was leased from the State for $32,000 a year, it was provided that the property might also be utilized for a subway rapid-transit line. Shortly afterward two successive Mayors, Messrs. Hunt and Spiegel, appointed unofficial commissions to investigate the feasibility of using the subway rights in the canal. After the recommendation by the first commission of a rapid-transit system estimated to cost $5,717,849—which with slight modifications has been reaffirmed by subsequent commissions—the State Legislature in 1915 passed a bill authorizing the city, upon a favorable vote of the electors, to create a rapid transit commission of five members to be appointed by the Mayor. This body was empowered to issue bonds up to $6,000,000 with the approval of the city for the construction of a rapid-transit line and to operate the line or lease it upon the approval of the electors. The new commission completed the work of the former bodies, and in April, 1916, the electors by a six-to-one vote approved a $6,000,000 bond issue after the commission had promised that no money would be spent until a plan had been worked out for leasing the new line to an operating company.



MAP SHOWING PROPOSED RAPID-TRANSIT LINE AND INTERURBAN ENTRANCE FOR CINCINNATI

JOINING THE QUESTIONS

During 1916, therefore, the city of Cincinnati fortunately reached the point where the questions of franchise revision, interurban entrance and rapid transit all came up for final discussion. The thought immediately arose that it would be much better from the point of view of economy and service if the proposed rapid-transit line could be operated in connection with the surface lines. Both before the Rapid Transit Commission and the committee on street railways of the Council expressions were unanimously in favor of a unified transportation system. A joint conference committee representing both bodies was appointed, therefore, and after months of hearings and negotiations a unifying ordinance was drafted by the city authorities.

It was at first intended to provide for the operation of the new line, the Cincinnati Rapid Transit & Interurban Railway, by the Cincinnati Traction Company and for the revision of the terms of the present franchise of the latter company by having it surrender the fifty-year franchise and accept an entirely new franchise. It was proposed that this new franchise should be worked out on the basis of an indeterminate permit, and that the purchase price fixed in the franchise should also be made the basis for a definite return to the company. The company expressed its willingness to make such a franchise exchange, but the attorneys for all the parties interested were of the opinion that the Ohio law would not permit such a move. Companies that consolidated under the Rogers law were empowered to accept indeterminate franchises, but inasmuch as the Cincinnati Traction Company was the only consolidation, it was believed that the indeterminate franchise provision would be unconstitutional under Ohio statutes because of specific application.

For this reason it was found necessary to act under the existing franchise of the Cincinnati Traction Company. The result is an ordinance revising the terms of the present franchise to include the operation of the rapid-transit line. This was passed by the Council on March 14 and approved by the Mayor, and, except as noted hereafter, it will stand as the revised franchise until the next revision in 1931, when both the surface and the rapid-transit terms may be changed. In its other character, that of a lease of the new line to the operating company for the remaining period of the franchise, the ordinance has been signed by the Rapid Transit Commission and company officials but must be approved by vote of the general electorate on April 17. If the vote is favorable, unified operation becomes possible immediately; but if it is unfavorable, the Rapid Transit Commission will automatically be succeeded by a new board, and the whole question of franchise revision must be entirely reopened.

If the proposed ordinance is finally adopted, the Cincinnati Traction Company will still have a term franchise, subject to one more revision, with the expiration date of the franchise itself and of the included rapid-transit lease both in 1946. In every possible respect, however, the ordinance has been drafted along the line of an indeterminate permit, and it is hoped that such a franchise may be ultimately secured under new legislation, if the property is not purchased by the city.

THE NEW RAPID TRANSIT ROUTE

To take up now the various important points of the proposed unifying ordinance, it may be said that the accompanying map shows the general character of the rapid transit line or "loop" to be built. The basic plan provides for a 15.56 mile double-track system, standard gage, with a rapid-transit "U" with no grade crossings from Oakley station to Crawford station by way of the downtown district, and a high-speed surface line on the north side to connect the two ends. On the west side of the "U" there will be a subway from near Fountain Square up Walnut Street to meet the old canal, which will be followed in the form of a covered subway to Brighton station and an open subway to Crawford station. On the east side, connecting with the subway at Fountain Square, there will be a steel elevated up to the

Eden Park Reservoir, a concrete trestle along the Ohio River bluff and an open cut and fill to Oakley station. More than a third of the northern line connecting the top of the "U" will, at the western end, lie in the canal bed. The whole north-side section will for a time be operated as a surface line but will become a rapid-transit line eventually.

The ordinance provides that the city is to construct the loop but the company is to provide cars and power, the latter either through its own facilities or by purchase. The company is obligated to begin operation of part or all of the new line as soon as in the opinion of the Rapid Transit Commission it can be done, and it must maintain the line, together with any extensions or additions that the board may make.

HOW INTERURBANS MAY ENTER

The ordinance provides that the Cincinnati Traction Company shall grant interurban railways the right to use the rapid-transit route and also such parts of the company's own tracks as it may be necessary for the interurban companies to use, if possible, to reach the rapid-transit line, all upon terms, conditions and compensation proportionate and equitable. Contracts made between the interurban and the operating companies shall be subject to the approval of the Rapid Transit Commission. In case any interurban line and the operating company cannot agree upon terms for such a contract, the board shall prescribe the terms and the operating company shall accept them unless it can be shown on appeal that the terms are not equal and equitable, this appeal being possible for either the operating or the interurban company.

The foregoing map shows the approximate termini of the existing interurban lines and the contemplated connections with the rapid-transit loop, over which their cars would be operated into the proposed interurban freight terminal in the business district. The present financial plans for loop construction do not cover the cost of the physical connections with the interurban lines, and the question of city aid in this matter is for future settlement. The necessary new construction in most cases, however, is small, and it is hoped that the interurban lines will perform this work without delay. Of the two western and most distant lines, the Indianapolis & Cincinnati Traction Company, as before stated, stands ready to extend its lines over the Indiana border when entrance is assured, and the Cincinnati, Laurenceburg & Aurora Electric Street Railroad in April, 1916, secured a franchise for an allied line from its terminus at Anderson's Ferry into the business district.

SERVICE CONTROL, FARES AND TRANSFERS

The foregoing two sections have dealt with the two fundamental lease characteristics of the ordinance—*i.e.*, rapid transit and interurban entrance. Arising partly in connection with the lease arrangement, but more as concessions in the franchise revision, are other points deserving of special mention. For example, the ordinance reserves to the city the control of service on the surface and rapid-transit routes, including the right to fix schedules, types of cars and other operating details; and it specifically gives to the city the right to approve additions, authorize securities, change routes and order extensions thereof. The company may resist any service or extension order on one ground only, that compliance would mean the impairment of the minimum return to the company and the percentage tax to the city that are set in the ordinance. The control of the surface routes is placed in the hands of the Mayor, and that of the rapid-transit route in the Rapid Transit Commission. The Mayor, with the approval of the board, shall appoint a city street railroad commissioner to keep in direct touch with the operation of the surface lines and the rapid-transit line and act as technical advisor to the Council, the Mayor and the board.

If in the future legislation is enacted by the General Assembly of Ohio or provision is made by city charter for other officials or boards to have the control that is vested by the ordinance in the Mayor, the Council, the Rapid Transit Commission, the city street railroad commissioner or other individual or board, the new body created is to have all such authority vested in it. This is provided for because it is held by the attorneys to be impossible at the present time to give any individual or board complete control over both the surface system and the rapid-transit line, although it is desired to merge this control as soon as possible into some single official or body.

The ordinance sets until 1931 a fare of 5 cents upon the lines of the Cincinnati Traction Company and the rapid-transit route, with 3 cents for children. This 5-cent rate is also to cover the Millcreek Valley lines within the city limits. These lines (the Cincinnati & Hamilton Traction Company) are operated under lease by the Ohio Traction Company, but by covenant under the ordinance they are to be operated, as far as they lie south of the present north city line, the same as any route of the Cincinnati Traction Company. Moreover, the receipts of the entire Millcreek Valley lines are to be included in the gross receipts of the combined system, and rentals therefor included in the rental to be paid.

Under the proposed arrangement the city will have a universal transfer between all cars of the combined system—that is, a transfer by which passengers may be able to travel over various routes so as to reach their destination by direct route or routes for one fare, providing only that transfers shall not be issued which will permit a return to the point of boarding the car. This will allow a transfer from a surface line to the rapid-transit loop, and *vice versa.* The transfer regulations are to be filed with the Mayor and subject to his change, and his decisions in regard thereto will be final.

HOW GROSS RECEIPTS WILL BE DISTRIBUTED

Beginning with Jan. 1, 1917, it is proposed that the annual gross receipts of the surface system, the Millcreek Valley lines and the rapid-transit line shall be used for certain purposes in a designated order. They may be included under four groups, as follows:

1. Operating expenses of the entire system, including injury and damage payments made after Jan. 1, 1917; taxes, except the city's gross earnings tax; depreciation charges, and the annual payment of principal on $609,000 of outstanding equipment notes of the Cincinnati Traction Company and any similar notes hereafter approved. Depreciation charges are to be made as at present for five years after Jan. 1, 1917, unless otherwise ordered by the State Public Utilities Commission, and then this body is to fix charges for setting up depreciation funds on the surface system, the Millcreek Valley lines, the rapid-transit line and the equipment of the rapid-transit line owned by the traction company. The funds are to be invested and used for renewals and replacements.

2. The next group of charges includes first the rentals of the Cincinnati Traction Company, amounting to $1,134,337, and of the Cincinnati & Hamilton Traction Company, amounting to $100,600. The next deductions are $215,000 for interest and $82,445 for sinking funds on $4,000,000 of capital expenditures (Ohio Traction bonds, $2,500,000, and notes, $1,500,000) up to Dec. 31,

1916; the annual interest on the unpaid balance of the $609,000 of equipment notes, and all fixed charges on new capital expenditures approved by the city. The last deduction in this group is $416,000, which represents approximately 6 per cent on the money invested in the property since the lease from the Cincinnati Street Railway, less the $4,609,000 of reducible debt to be retired.

This figure of $416,000 was the result of a discussion of a number of methods of figuring the proper return to the company upon its investment. For instance, through its financing company the Cincinnati Traction Company has expended on its leased property $10,290,000, which with the Millcreek Valley investment of the Ohio Traction Company, together with certain other allowances, gives a total investment of $11,525,000. Deducting the $4,609,000 of reducible debt leaves $6,916,000, upon which 6 per cent is $414,960. To use another method, it was pointed out by the Cincinnati Traction Company that its financing organization had furnished money to it without banking charges, and that, with an addition of 10 per cent of the investment to cover these, the return of 6 per cent upon the nonreducible debt would be $434,680.

The operating company asserted its right to a 5 per cent return on the outstanding $8,500,000 of preferred stock of the Ohio Traction Company, or $425,000, but the city insisted upon deducting the $9,000 by which the Millcreek Valley lines failed to meet rentals last year. The sum of $416,000 was finally chosen as the permissible return. This does not quite meet the full dividend on the Ohio Traction preferred stock, and leaves the almost equal amount of common stock of this company dependent upon the earnings from the Traction Building and its investment in the Cincinnati Car Company.

3. The next group includes a payment of $325,000 a year to the city in lieu of the 6 per cent tax heretofore paid on the gross receipts of the surface lines. This simply liquidates this tax at its present figure in order not to necessitate a separate accounting for surface and rapid-transit receipts. The group includes, as rapid-transit rental, the interest and sinking fund payments on bonds issued to build the new line or any extensions, and also the payment of $120,000 a year into an amortization fund. When the fund in twenty-five years reaches $5,000,000, and if it is not used as part payment for a city purchase of the surface system, it is to be paid to the company to reduce its outstanding stock and also reduce the return of the company from $416,000 to $116,000.

All of the foregoing payments are cumulative in the order named. In other words, if in any year the amount necessary to make any one of these payments is not earned, the deficit by which it is not earned shall be taken out of the next year's earnings before any subsequent payment is made.

4. The last group provides for the distribution of all earnings in excess of the amounts referred to above between the city and the company on the basis of 55 per cent to the city and 45 per cent to the company.

The fixing of Jan. 1, 1917, as the start of the accounting period for the new arrangement is of advantage to the city. Under this plan the city will have the full year's surplus earnings of the company to draw from. As the company has heretofore earned in excess of the amount of its agreed minimum earnings and the city's $325,000, these excess earnings will go to the city for the full year to be used in paying the interest and sinking fund on such of the rapid-transit bonds as may be issued during the year.

Owing to the slowness of the three-year work of company, city and State in valuing the property, a purchase-price agreement, based on the investment, has been made to facilitate matters. Under the proposed ordinance the city will have the right to purchase the property of the company in either of two ways. (1) By the payment of $26,238,950, plus the amount of the reducible debt that may then be outstanding and any additional securities that may have been issued with the approval of the city, and less the amount in the amortization fund at the time of purchase. (2) By condemnation or other proceedings allowed by law. The purchase price includes the entire property of the Cincinnati Street Railway and the Cincinnati Traction Company in any way connected with the local transportation system, and includes also all franchises that the company may have from any other municipalities such as Norwood, St. Bernard and Cheviot. It includes practically everything that the Ohio Traction Company owns as well, except the Traction Building and such securities as it may own, including the stock of the Cincinnati Car Company.

OBJECTIONS TO THE ORDINANCE

Since the presentation of the ordinance, organized opposition has been confined to a citizens' committee, which has made a few objections to the plan—backed by the local Democratic organization, which has developed a tendency to make political capital out of it. It is said that divided control over the combined system is not desirable, but no better arrangement is possible under existing laws. Some desire specific provisions in the ordinance for bringing in the interurban lines, but legal authorities all agree that this matter would better be left to adjustment under a general clause. The interurban lines themselves at first wanted specific contracts, but they have examined the ordinance and have approved it in its present form. Some of them will have to change their gage to use the rapid-transit line, but this, it is believed, they are willing to do.

The basic objection to the ordinance, however, seems to be that the company receives a return on its investment before the payment of the city tax. In regard to this the Rapid Transit Commission has issued to Cincinnati voters the following significant statement:

"During the progress of negotiations with the company, one feature of an indeterminate permit, that is, the automatic readjustment of rates of fare, was discussed. It was felt, however, by those handling the matter for the city that, owing to the present high costs of all material, there was no possibility of a reduction in the rate of fare, at least not before the city is in a position to exercise its next right of revision in 1931. Therefore, the power to adjust fares was not provided for, and the withholding from the company of this protection, which is one of the elements of an indeterminate permit, together with the complete right of control given to the city by the ordinance, made it necessary to provide some other form of protecting the company in its minimum return. The form decided upon was to allow the company to receive its minimum return before the payments to the city are made. The committee would have placed the interest and sinking fund on rapid-transit bonds ahead of the city's gross earnings tax in the order of payment were it not for the fact that it has always been anticipated that the interest and sinking fund on the rapid-transit bonds would be paid for a number of years from taxes, and the city's financial requirements are such that it must secure the gross earnings tax. It is necessary to understand, however, that there is absolutely no guarantee to the company that it will receive its minimum return. In a number of other cities where a minimum return to the company has been recognized, there has been a guarantee that the company shall receive the minimum return through fare adjustments, if necessary, but the protection allowed the company in this instance is the provision that its return shall be so placed that the action of the city in ordering extensions and service will not impair it."

An allied objection is that there is no guaranteed rental for the rapid-transit line. In the opinion of the Rapid Transit Commission, however, the first years of operation of the rapid-transit line will probably be at a loss, and the company could not be expected to carry this burden. In return for the city sustaining these losses, however, the company is limited to the return now being paid out, plus interest and sinking fund on future approved capital investment, and the excess thereafter from the operation of the larger system will be applied first to the city's requirements, with a division between city and company of any remaining profit.

WHAT THE COMMISSION AND THE COMPANY THINK

According to E. W. Edwards, chairman of the Rapid Transit Commission, the joint committee has contended that it should get every right and advantage for the city that would still leave the company unhampered and solvent—further than that it should not go and less than that it has not gone.

The Cincinnati Traction Company, it is said, has indeed yielded every point possible, because it believes that the city needs the rapid-transit line and the company will eventually share in the city development; because it realizes that a traction war about franchise revision terms would be harmful to all parties concerned, and because under the existing conditions it has been unable to do new financing. The ordinance is unique in that the company on a mere revision of franchise terms agrees to limit its fixed return so as to contribute a large portion of the earnings to help support the city system—and that, too, with city control and no guarantee of the minimum return. The ordinance primarily is the work of the city authorities, but in the interest of harmony and civic improvement the company is willing to accept its more restrictive provisions.

A very strong organization to get back of the rapid-transit proposition has been launched under the name of the Citizens' Rapid Transit Committee, with headquarters in the Union Central Life Insurance Building. The committee includes some of the most prominent business men of the city, particularly the heads of the largest department stores, theaters and factories.

Poster Warns Against Trespassing

The Pennsylvania Railroad is posting a conspicuous notice warning of the danger of trespassing. The poster bears a fac-simile of the standard warning signal adopted by American railroads for the use of watchman, and illustrated on page 270 of the issue of this paper for Aug. 12, 1916. It consists of a white disk with the word "Stop" in large black letters. The fac-simile of the signal is brought out in striking prominence by an orange background. The poster bears these words:

"Do not risk your life by trespassing on the railroad. More than 5000 men, women and children are killed every year in this country while taking 'short cuts' over the tracks or otherwise trespassing on railroad property. Don't take this chance."

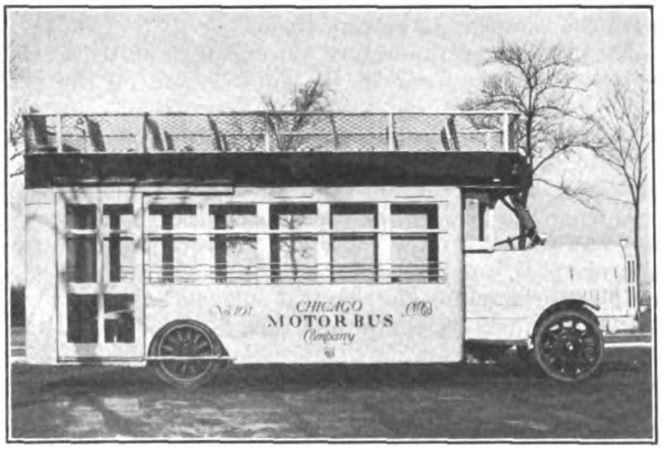
The new "Stop" poster is being displayed at places where the general public is accustomed to take short cuts across the tracks or to use the railroad right-of-way as a highway. It will also be placed on all bulletin boards in stations east and west of Pittsburgh.

Chicago Motor Bus Line Begins Operation

Two to Three-Minute Service to Chicago's North Side Now Possible—Similar Service to South Side to Begin in Summer

A FURTHER addition to Chicago's transportation systems began its initial operation on March 25. This comprises a regular bus line service from the loop district north, through Lincoln Park and continuing out the Lake Shore Drive and Sheridan Road to Devon Avenue, a one-way distance of approximately 9 miles. The first fifty buses are being received rapidly, and when these are in service the company expects to be able to give a two-minute or three-minute service from the loop district during the rush hours to points along the north shore. During these rush hours, the buses will give express service from the loop to different main points on the North Side and operate local service beyond these. A 10-cent fare will be charged.

The buses are a marked improvement over those hitherto used in Chicago. The bodies were built by the St. Louis Car Company and are constructed of steel with the rear stairway to the upper deck inclosed and a sliding door closing off the vestibule. Passengers only up to the seating capacity of the bus will be carried, which means twenty-nine on the upper deck and twenty-two below. The side posts are equipped with push-button signals. Electric lights are mounted in the headlining and supplied with refractors. Operation has been begun as an experiment on the pay-as-you-enter system, using Rooke automatic registers.



NEW BUS RECENTLY PUT IN REGULAR SERVICE BY THE CHICAGO MOTOR BUS LINE

The tractors were built by the Moline-Knight Company and are rated at 50 hp. The entire power plant and driving mechanism is mounted on the front axle so that the power unit may be detached from the body and another put in its place in thirty minutes, thus making it possible to keep the body in practically constant service. It is expected that the buses will be able to make 25 m.p.h., but the schedule speeds have not as yet been determined. The buses complete weigh approximately 10,000 lb.

A franchise was very recently granted to the same company for a similar line of buses through the South Side parks, and an order for fifty more buses has been placed. Operation is expected to begin on the South Side during the latter part of the summer. George B. Crowley is general manager of the Chicago Motor Bus Company, and W. J. Sherwood, formerly superintendent of the Mobile Light & Railroad Company, is superintendent of transportation.

Interborough Solicits Complaints

The Recent Campaign Brought Out More Than Seven Thousand Letters, Mostly Appreciative of the Company's Efforts — Each Was Answered Individually — Typical Suggestions and Replies Are Published

By IVY L. LEE

WHATEVER else has been said, no one has ever questioned the fact that the managers of the Interborough Rapid Transit Company, which operates the New York subway and elevated, were doing their job and doing it marvelously well.

President Shonts, Vice-President Hedley and those around them are running what some have called the "eighth wonder of the world." Certainly it is the wonder of the world as a city transportation machine. There has been nothing like it in history.

But that company has made up its mind not only to do its job but to get the co-operation of the public, to make the public know the company's problems and work with the company in solving them.

Late in January, therefore, the company posted on the windows of every car in the subway and on the elevated placards entitled, "We Ask Your Help." It was a frank appeal for public assistance, the beginning of a definite campaign to enlist the good-will of the people of New York on behalf of the Interborough company.

During the last two or three years the Interborough has had to face traffic conditions, on both the subway and elevated, unparalleled, perhaps, on any other railroad in the world. The original subway lines, approximately 96 miles in length, had been built by the city to care for a daily capacity of approximately 400,000 passengers. Yet within five years these lines were carrying 1,000,000 each day. Frequently during the past year the 1,500,000 mark has been touched.

To relieve this congestion as well as to extend the rapid-transit system to all parts of the city New York is now building nearly 300 miles of additional underground routes. Until these are ready for operation, however, existing lines must continue to carry their present burden. Here was a situation which was difficult for the company as well as the public. It was important that the public should understand the nature of the problems which had to be solved.

In the subway and elevated car cards, the Interborough frankly stated the facts. The company declared that it was running "every rush-hour train the tracks would hold"; that congestion was "bound to be abnormal until new subway lines were opened," and it asked the public for helpful suggestions to meet the situation.

HOW THE REQUEST WAS RECEIVED

The public's response exceeded all expectations, both in the number of replies and in the generally appreciative attitude toward the company's efforts. More than 7000 letters were received by President Shonts in February and March, and they are still coming in. In addition, scores of people called in person at the Interborough offices with suggestions. Others were invited to call and explain more fully ideas outlined in letters.

Every section of New York's varied social and business life was represented among President Shonts' correspondents. Lawyers, architects, merchants, civil, electrical and mining engineers, policemen, former Interborough employees, railroad men, stenographers, clerks, telephone operators, advertising men—all outlined various ways for dealing with congestion, or made suggestions for improving many minor points of service as they related to the particular line or station they used most frequently.

One business man wrote no less than thirty letters with suggestions to President Shonts. Business organizations and the New York Chamber of Commerce also accepted the invitation and made studies of the subway's operation.

HOW THE SUGGESTIONS WERE ANSWERED

The frankness of the company in thus dealing with the public—the only permanent foundation for public good-will—was further emphasized in the answers made by President Shonts to every suggestion received. Each letter of the entire 7000 received personal attention in the president's office. Not a single form letter was used, but every question was answered fully. To suggestions that on their face were impracticable reasons were given why they could not be adopted. Here was a real campaign of education. President Shonts determined to avail himself of this opportunity to make the people understand the problems he and his associates were trying so hard to solve.

Suggestions that seemed practicable were referred to a special committee from the operating department. On this committee President Shonts placed men who were experts in transportation problems, men who had studied the subway lines of London and Paris, who represented the best railroad brains in America, and who had spent years in making New York's subway one of the safest and most efficient railroads in the world.

This committee is still at work on the suggestions received. Often it has been necessary to make extended studies of proposed changes. Traffic counts have frequently been made to determine whether existing service did not need revision in order to serve the greatest number. The principle on which the company's service is founded is the greatest good for the greatest number.

Many of these traffic counts are still going on, and if results justify the proposed changes, their adoption will be announced later. Likewise, the reasons why they are not adopted, should that be the case, will be made public.

OUTSTANDING FACTORS IN THE CAMPAIGN

In these letters from the public several factors stand out as suggestive to every public service corporation. All of them are convincing proof of the soundness of the proposition that the public, when it is fully informed as to the facts, can be trusted to judge fairly.

The Interborough, by the broadness of its invitation for suggestions or criticism, opened wide the door for the public to air its grievances. The opportunity was given to every disgruntled person, to every knocker, to "take it out" on the company. Yet few took advantage of it.

The predominant tone of all the letters was fairness. Nine out of every ten who wrote to President Shonts were earnest and sincere in their desire to help the company in its efforts to render service that, first of all, was absolutely safe, then comfortable and efficient. The amount of study and concentration displayed by the public on the subway and elevated problems was extraordinary. Frequently maps and diagrams with complicated solutions were handed in.

A summary of the public's suggestions appears in the issue for April 6 of *Rapid Transit*, the company's bulletin, together with reprints of many of the letters. These will cover the main suggestions made by the public. Following each one President Shonts' reply is printed setting forth the reasons why the company operates as its does.

SOME OF THE SUGGESTIONS REPRODUCED

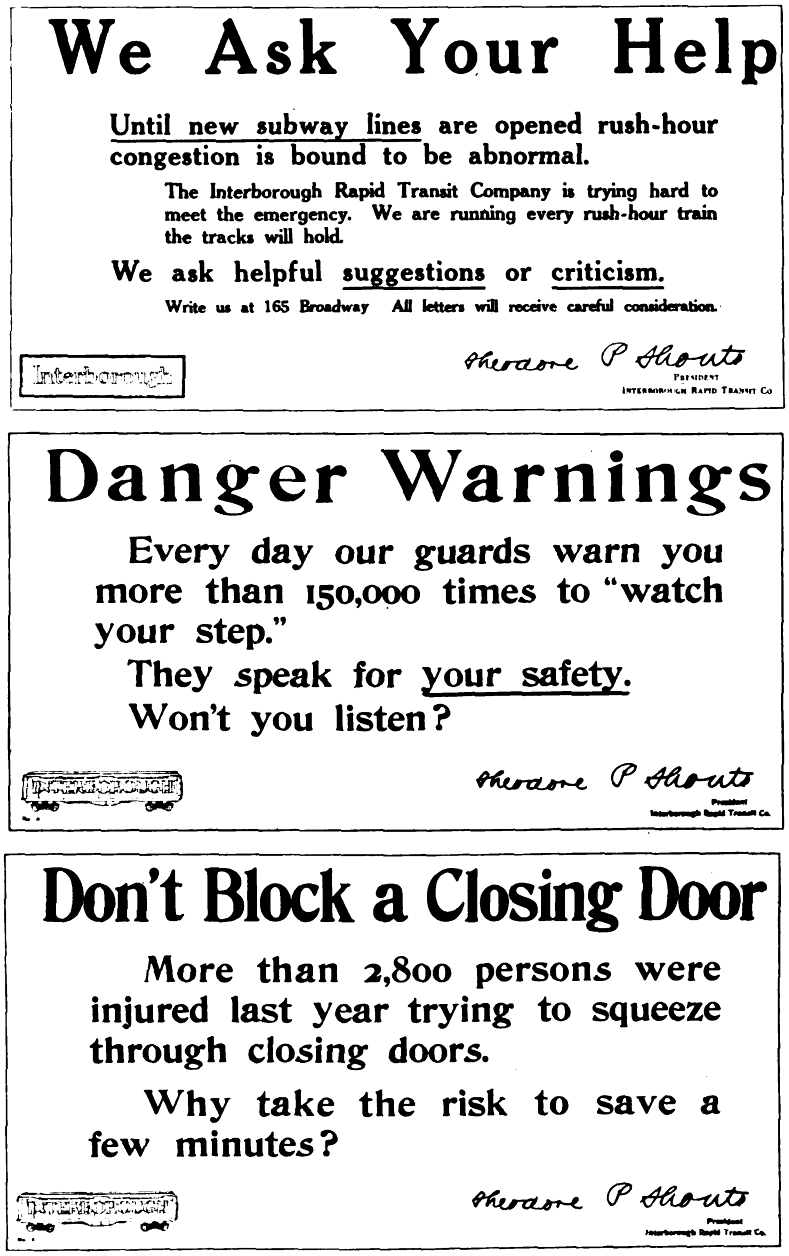
Some of the suggestions reprinted in this bulletin are the following:

1. "The use of end doors on subway cars for exit, with entrance through the center doors, or vice versa, with exit at the center doors and entrance at the ends.

2. "To use both express tracks during the rush hours in the same direction. In other words, to run trains downtown in the morning over three tracks, with uptown service only over the one local track. In the evening this arrangement would be reversed.

3. "To operate both express and local trains, eliminating or 'skipping' certain stations. Thus it was proposed to operate certain rush-hour trains in the morning past Ninety-sixth Street without stopping or past Brooklyn Bridge at night."

Other leading suggestions were: To start fresh trains from Fourteenth Street or Forty-second Street in the evening without operating them over the entire line, thus affording additional facilities for these congested points. To reserve the last two or three cars on a train for women, etc.



We Ask Your Help

Until new subway lines are opened rush-hour congestion is bound to be abnormal.

The Interborough Rapid Transit Company is trying hard to meet the emergency. We are running every rush-hour train the tracks will hold.

We ask helpful suggestions or criticism.

Write us at 165 Broadway All letters will receive careful consideration.

Theodore P Shonts
President
Interborough Rapid Transit Co

Danger Warnings

Every day our guards warn you more than 150,000 times to "watch your step."

They speak for your safety.

Won't you listen?

Theodore P Shonts
President
Interborough Rapid Transit Co.

Don't Block a Closing Door

More than 2,800 persons were injured last year trying to squeeze through closing doors.

Why take the risk to save a few minutes?

Theodore P Shonts
President
Interborough Rapid Transit Co.

TYPICAL CAR POSTERS, INTERBOROUGH RAPID TRANSIT COMPANY

From among the large number of letters sent by President Shonts to those who responded to the company's request for help, these quotations are suggestive:

"We are doing everything in our power to instill in the minds of trainmen and platform guards in the subway the necessity of doing everything within reason to reduce the length of station stops."

"We are endeavoring to insure prompt closing of the car doors on crowded platforms by having extra men at leading congestion points."

"Our trainmen are thoroughly instructed in the importance of announcing the names of stations clearly and audibly. Instructions provide that on approaching a station they shall announce clearly and distinctly not only the name of that station, but also the name of the next stop. Then when the train leaves a station they are to again announce the name of the next station. Instructions in proper enunciation is given in the company's school car."

"There is no other feature of the duty of the platform man and guard on which more emphasis is placed than courtesy toward the public. Inspectors constantly ride over the lines checking up behavior. Letters of complaint bring prompt discipline and letters of praise are placed to the credit of the employee's record."

"Often passengers can make it much easier for the guards to be courteous by being themselves more considerate."

The care with which all suggestions were answered by President Shonts will be indicated by his response to a proposition to use subway end doors for entrance and side doors for exit. On that point, Mr. Shonts said:

"First. Each car has three openings. During the rush-hour period, northbound for instance, all stations south of Brooklyn Bridge are 100 per cent loading stations, while Brooklyn Bridge and Fourteenth Street are upwards of 90 per cent loading and less than 10 per cent unloading stations.

"To adopt your scheme, therefore, would be equivalent to reducing the loading capacity of the cars at these stations by 33 1/3 per cent, thus increasing the station stop accordingly.

"At stations north of Grand Central Station the situation is reversed, those stations being essentially unloading stations during the evening rush hours.

"At these points, therefore, the operation of your plan would have a tendency of reducing the unloading capacity of cars by 66 2/3 per cent, with a corresponding increased length of station stop.

"Second. Owing to the congestion at present prevailing during the rush hours, it would be a physical impossibility for short-haul riders, for instance, passengers embarking at Brooklyn Bridge or Fourteenth Street, destined to Grand Central Station, to work their way through the cars by the time the train had reached their destination, thus adding greatly to the general confusion and to the length of the station stop incident thereto.

"You will, of course, appreciate that the principle holds good whether the end doors be used for exit and the middle doors for embarking purposes, or *vice versa.*"

With reference to its policy of courtesy, Mr. Shonts said to one of his correspondents:

"Upon entering the service of this company all applicants must pass a thorough examination on all matters pertaining to train operation before they are assigned to regular positions, and, subsequently, must report back to the school car for re-examination and general review work.

"In this course of instruction there is no one feature upon which so much emphasis is laid in the education of the employees as the value and necessity for courtesy in their dealings with the public, under any and all circumstances.

"We also have quite an elaborate system for checking up the conduct of train employees, and every case of discourtesy thus revealed is made the subject of immediate investigation and discipline.

"Repeatedly we have invited the public to co-operate with us by reporting to us all cases of discourtesy on the part of our employees, and these cases are also made the subject of immediate investigation and discipline."

THE SPIRIT UNDERLYING THE COMPANY'S ATTITUDE

The general spirit underlying the Interborough attitude toward the public was set forth by Mr. Shonts in the concluding passage of the published bulletin, as follows:

> **We are not satisfied. We are trying every day to improve our methods, and we want the people of New York to realize deep down in their hearts that that is the spirit in which we are operating these lines.**
>
> ***Theodore P. Shonts***

Changing the Fare Collection System Complete Over Night

Paper Tickets Displaced by Metal Tokens—New Fare Boxes Installed on All Cars and P-A-Y-E System, Previously in Use on Only Thirteen Cars, Installed on All Forty-four Cars in Service in Evansville, Ind.

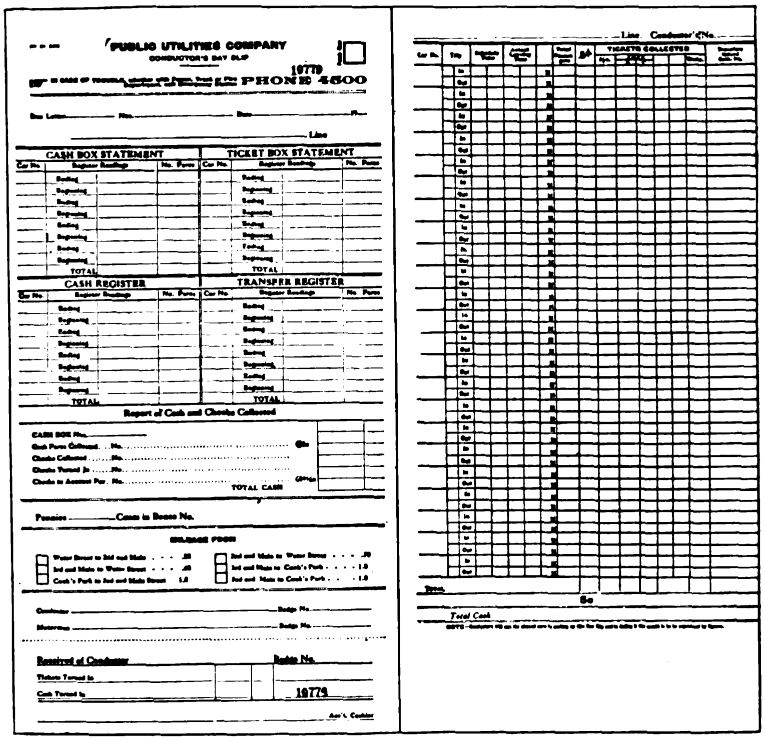
A COMPLETE over-night change of fare collection methods involving objections from both public and employees, as well as operating difficulties, both of which were unearthed and carefully ironed out in advance, is the accomplishment of the Public Utilities Company, Evansville, Ind., of which B. E. Parker is general superintendent, railway department. So radical a change, including as it did the adoption of metal tickets to displace the six for 25 cents paper tickets, and the complete installation of the pay-as-you-enter system with new fare boxes—changes new to both public and trainmen—might easily have been accompanied by a bungling of the whole scheme and an avalanche of criticism from the public press and the street car patrons. But instead, the change was made with apparent ease and the first day wore away with little confusion. Even the newspaper which is usually the strongest in its criticism of the company had nothing but words of praise to say for the new scheme. The men were pleased because it made less work for them, and the public liked the ease with which fares could be thrown into the hopper as compared with inserting a ticket in a narrow slot. The success was simply the result of a carefully planned preliminary educational campaign conducted among employees and patrons as well.

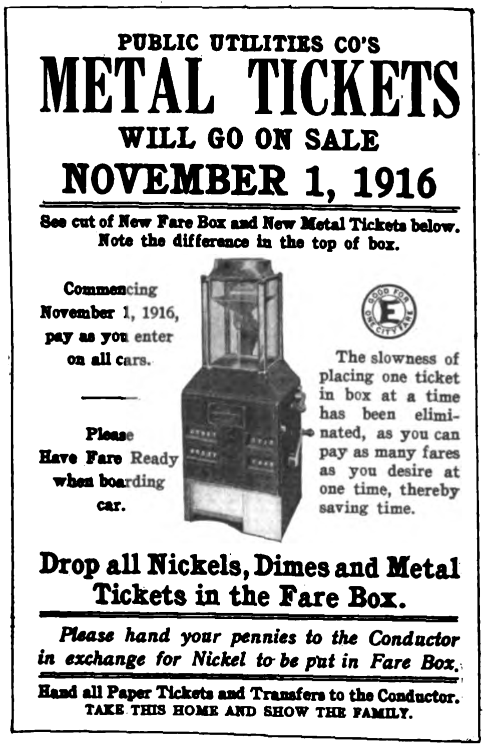
THE NEW COLLECTION SYSTEM

Previously the company had had only thirteen cars operating on the pay-as-you-enter plan—thirteen out of forty-four cars in service. These thirteen cars were equipped with the Johnson fare box of the coin-counting and ticket-canceling type, where the cancellation was done by perforating the ticket as it passed through the box. These fare boxes were being beaten, and the company was aware of a loss of revenue from this and other sources. Two motor-driven ticket-counting and ink-cancelling machines, supplied with energy first from a storage battery and then from the trolley circuit, were tried out, but these were considered too slow and mechanically unsatisfactory. Other systems were studied, but none seemed to combine all the requisites demanded by the company. Then after many months of experimentation and co-operation with the manufacturer, the system of metal tickets used in conjunction with a fare box registering nickels, dimes and tickets and a clock register giving an audible registration of every class of fare paid was brought out. This system was described in detail in ELECTRIC RAILWAY JOURNAL for Nov. 25, 1916, page 1120. As applied to the Evansville cars, it includes the German silver alloy tickets, slightly smaller than a dime, and a Johnson fare box registering tickets on one cyclometer and cash fares on another. Accompanying these were Sterling or International clock registers recording cash and ticket fares on one side and transfers on the other, thus giving a bell registration for every passenger boarding the car and a double check on the revenue fares paid. The sum of the ticket and cash-fare readings on the fare box should equal at all times the reading on the revenue side of the clock register, and the reading on the non-revenue side of the clock register should check the number of transfers and employees' and charity pass paper tickets held by the conductor, the latter being rung up as non-revenue fares the same as transfers. This equipment with the pay-as-you-enter system installed on all cars constituted the complete change that was to be made. Then to get ready.

GETTING READY FOR RADICAL CHANGE

Of first importance was the preparation of the men. To this end one of the new fare boxes was installed in the trainmen's room, and a generous supply of coins and metal tickets provided. Here the men had ample time during the several weeks previous to the installation of the new system to test the box and thoroughly familiarize themselves with its operation. They got the spirit of the preliminary preparation and would take turns playing conductor and passenger and try to get each other "balled" up. They had time to worry out the details, and one of the things which they soon discovered was the difficulty of making out the trip sheets, which involved computations with the 4 1/6-cent ticket as the base and totals which came out in odd cents and fractions of a cent. This had been anticipated and when the men discovered the trouble they were equipped with the folder, illustrated, in which the computations were all made for them in even money, so that all they had to do was take the figures out of the folder. This contained the values of from twenty-five up to 600 tickets and told them just how much cash and how many tickets over they should turn in to equal the fares registered and called for on the day's trip sheet. A sample conductor's report is also shown with the turn-in receipt attached at the bottom, which avoids later disputes. In this report the total in the "cash box statement" plus the total in the "ticket box statement" should equal the total in the "cash register statement." The reverse side of the conductor's report is formed up for the detailed trip report. Other details and causes for grievance were worked out in the same manner, with the result that the men were ready for the change and knew what they were about. They had come to like the system before it was installed on the cars.


PUBLIC UTILITIES COMPANY
CONDUCTOR'S DAY SLIP
19779
PHONE 4500
CASH BOX STATEMENT
TICKET BOX STATEMENT
CASH REGISTER
TRANSFER REGISTER
TOTAL
TOTAL CASH
19779


PUBLIC UTILITIES CO'S

METAL TICKETS

WILL GO ON SALE

NOVEMBER 1, 1916

See cut of New Fare Box and New Metal Tickets below. Note the difference in the top of box.

Commencing November 1, 1916, pay as you enter on all cars.

Please Have Fare Ready when boarding car.

The slowness of placing one ticket in box at a time has been eliminated, as you can pay as many fares as you desire at one time, thereby saving time.

Drop all Nickels, Dimes and Metal Tickets in the Fare Box.

Please hand your pennies to the Conductor in exchange for Nickel to be put in Fare Box.

Hand all Paper Tickets and Transfers to the Conductor.
TAKE THIS HOME AND SHOW THE FAMILY.

CONDUCTOR'S REPORT SHEET, FRONT AND BACK, AND ADVERTISEMENT ANNOUNCING CHANGE

PREPARING THE PUBLIC

The pre-education of the public was also carefully planned and executed. Samples of the metal tokens were shown to the newspaper men and the advantages of the new system explained to them, so that they were solid on the idea before it was made public. Company officials called on the merchants and bankers and told them the story and pointed out the advantages. Some did not like the idea at first, the principal objection alleged being on the size of the ticket, which is slightly smaller than a dime but thicker. Laboring men readily appreciated the advantages of the metal tickets to them, for they could be carried in their trousers' pockets with their money, whereas paper tickets carried there were often ruined from sweat and could not be used, yet it was dangerous to leave them in their coats because of theft. Each citizen with whom the system was discussed in advance of its installation became an advertiser for the scheme among those with whom he came in contact, and the result was that the company received numerous calls asking when it proposed starting the new system, the public apparently becoming anxious. Then it was announced in the newspapers with advertisements, with articles in all the papers and with notices like the advertisements placed conspicuously in all the cars, that on Nov. 1, 1916, the metal tickets would go on sale. They did.

THE CHANGE WELCOMED

The system went into use with practically no confusion and was received as a novel innovation—something new and convenient. The public bought the new German silver tokens in generous numbers the first day, and hundreds of them were sent away to friends as souvenirs. A loss to the company? Yes—of tickets, but not money, for on every ticket which is lost or destroyed or taken out of town the company makes a profit of approximately 50 per cent. The money received from the sale of tickets is not counted as income until it comes in by way of the fare box, so for every one lost the company has the money in the treasury to put one and one-half tickets in its place. The company is not concerned with what becomes of the tickets if the supply must be replenished from time to time, as they represent no economic loss. A paper ticket lost, of course, represents very nearly the price of a ride profit to the company, but this is not a matter of moment. The metal ticket is sufficiently high in value, however, that it would not make a profitable counterfeiting enterprise, which is not true of the paper ticket.

At the start the Evansville Company ordered 70,000 tickets and then shortly 10,000 more to take care of a population of 100,000. Each conductor received $5 worth and a special ticket change carrier equipped with a lever throwing out six tickets at a time—the usual purchase. From then on the dealing in tickets has been the conductor's own transaction. He buys from the company and sells to the riders. He marks down his own money in the morning and at the end of his run deducts this from what he has, and the remainder should approximately balance with the amount called for by the register, the variation being accounted for by the slightly greater number of tickets sold than received, or vice versa, but averaging up from day to day to approximately the registration. His supply of tickets and change is constantly replenished by the tickets and coins paid in, to which he has access after they are ground through the fare box.

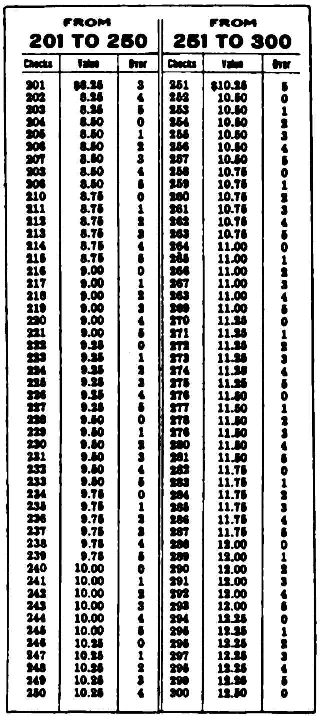
Pennies are exchanged by the conductor for a nickel which the passenger drops into the fare box. Should the passenger drop five pennies in the box before the conductor stops him, or if he had no other coin, the conductor can see on the inspection plate if five of them were deposited and can accept them as a fare, making note of it on his report sheet. Pennies thus deposited are not registered but are shuttled into a locked compartment to which the cashier only has access. If anyone drops one penny in the box and tries to "get by," he loses the penny and pays a nickel as well, or otherwise the conductor will have one more fare registered on the clock register than in the fare box. This possibility keeps the conductors alert to the use of the inspection plate. However, very little trouble from the copper coin has been experienced, as is evidenced by the fact that in four months' operation there have been only 66 pennies a day in forty-four boxes on the average.

During a few weeks after the change the conductors, of course, had to accept paper tickets previously sold, and these were taken by the conductor and rung up on the clock register as revenue fares. This introduced a possibility of loss, but it was only a temporary though unavoidable condition to the change.

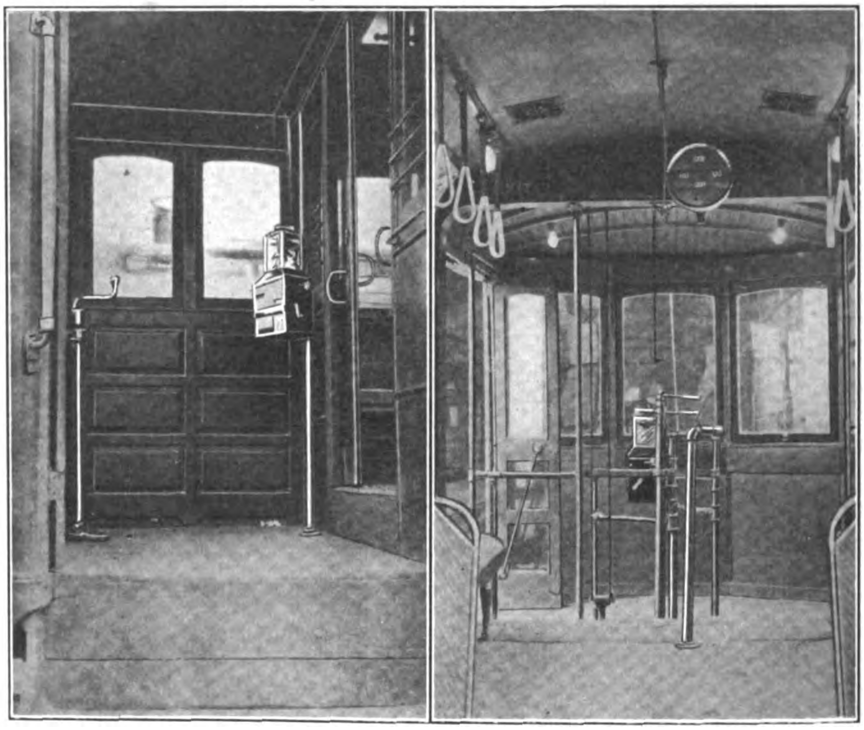
The proof of the system is in the receipts. The company installed the system in order that it might get all the revenue it earned, and the following figures tell the story:

	1916-1917 Increase Over 1915-1916	1915-1916 Increase Over 1914-1915
November	15.90 per cent	5.72 per cent
December	16.24 per cent	3.05 per cent
January	13.70 per cent	8.97 per cent
February	12.33 (28 days 1917) (29 days 1916)	16.49 (29 days 1916) (28 days 1915)

The good showing is due in part to the more efficient pay-as-you-enter system, in part to the efficiency of the fare box, in part to the extra safeguards made possible by the metal ticket, and perhaps in small part to the normal growth of the city. In addition to the monetary results the rate of loading has been noticeably speeded up. The conductors, a number of whom were questioned by the writer as a stranger and in a way that would give them every opportunity to comment adversely, are all enthusiastically for the new scheme. Their only difficulty in starting it off was in making out reports, but this was mastered after two conductors' meetings at which the general superintendent explained away the troubles.



FROM 201 TO 250			FROM 251 TO 300		
Checks	Value	Over	Checks	Value	Over
201	$8.25	3	251	$10.25	5
202	8.25	4	252	10.50	0
203	8.25	5	253	10.50	1
204	8.50	0	254	10.50	2
205	8.50	1	255	10.50	3
206	8.50	2	256	10.50	4
207	8.50	3	257	10.50	5
208	8.50	4	258	10.75	0
209	8.50	5	259	10.75	1
210	8.75	0	260	10.75	2
211	8.75	1	261	10.75	3
212	8.75	2	262	10.75	4
213	8.75	3	263	10.75	5
214	8.75	4	264	11.00	0
215	8.75	5	265	11.00	1
216	9.00	0	266	11.00	2
217	9.00	1	267	11.00	3
218	9.00	2	268	11.00	4
219	9.00	3	269	11.00	5
220	9.00	4	270	11.25	0
221	9.00	5	271	11.25	1
222	9.25	0	272	11.25	2
223	9.25	1	273	11.25	3
224	9.25	2	274	11.25	4
225	9.25	3	275	11.25	5
226	9.25	4	276	11.50	0
227	9.25	5	277	11.50	1
228	9.50	0	278	11.50	2
229	9.50	1	279	11.50	3
230	9.50	2	280	11.50	4
231	9.50	3	281	11.50	5
232	9.50	4	282	11.75	0
233	9.50	5	283	11.75	1
234	9.75	0	284	11.75	2
235	9.75	1	285	11.75	3
236	9.75	2	286	11.75	4
237	9.75	3	287	11.75	5
238	9.75	4	288	12.00	0
239	9.75	5	289	12.00	1
240	10.00	0	290	12.00	2
241	10.00	1	291	12.00	3
242	10.00	2	292	12.00	4
243	10.00	3	293	12.00	5
244	10.00	4	294	12.25	0
245	10.00	5	295	12.25	1
246	10.25	0	296	12.25	2
247	10.25	1	297	12.25	3
248	10.25	2	298	12.25	4
249	10.25	3	299	12.25	5
250	10.25	4	300	12.50	0



SECTION OF FOLDER FOR AIDING CONDUCTORS IN MAKING OUT REPORTS, AND VIEWS OF FARE BOX ON REGULAR P-A-Y-E CAR

Output of Large Generating Systems

The *Electrical World* for this week is publishing its annual statistics of large generating stations. Approximately two-thirds of the central station energy of the country is generated by forty-one companies, chiefly in hydroelectric stations. During the past year there has been an increase of more than 2,000,000,000-kw.-hr. The following figures are for the ten largest companies, measured on a yearly output basis.

System	Peak Load (Kw.)	Date of Peak Load	Yearly Output (Kw.-Hr.)
Commonwealth Edison Company	369,740	Dec. 19	1,341,964,000
Niagara Falls Power Company	143,360	Nov. 24	1,015,525,680
Ontario Power Company of Niagara Falls	123,900	Oct. 12	942,221,900
New York Edison Company & United Electric Light & Power pany	254,824	Dec. 20	856,385,319
Montana Power Company	149,740	Dec. 19	867,940,326
Pacific Gas & Electric Company	141,008	Dec. 19	768,304,907
Hydraulic Power Company	89,275	Dec. 26	717,079,320
Toronto Power Company	129,000	Dec. 20	660,873,579
Public Service Electric Co. of N. J.	174,000	Dec. 14	608,018,729

Analyses of P. R. T. Proposal

Director Twining Criticises Philadelphia Company's Plan for Leasing New City-Built High-Speed Lines—Ford, Bacon & Davis Suggest Means of Meeting Estimated Deficit—Recourse to a 6-Cent Fare May Be Necessary

On March 29, as mentioned in the news columns last week, William S. Twining, director Department of City Transit, Philadelphia, Pa., sent to Councils a report criticising the proposal submitted to the city on Dec. 20, 1916, by the Philadelphia Rapid Transit Company for the lease and operation of the new city-built high-speed lines. In Mr. Twining's opinion the proposal aims not to lease the city's property to the company, but to lease the company's property to the city at a fixed rental of $1,500,000, the company remaining in charge of operation without a proper degree of responsibility. Mr. Twining outlined what he considers the essentials of a fair contract between the company and the city, and then recommended that the city change its construction program so as to bring the estimated deficits within reasonable limits, as set forth in an appended report from Ford, Bacon & Davis, New York, N. Y., the consulting engineers for the city.

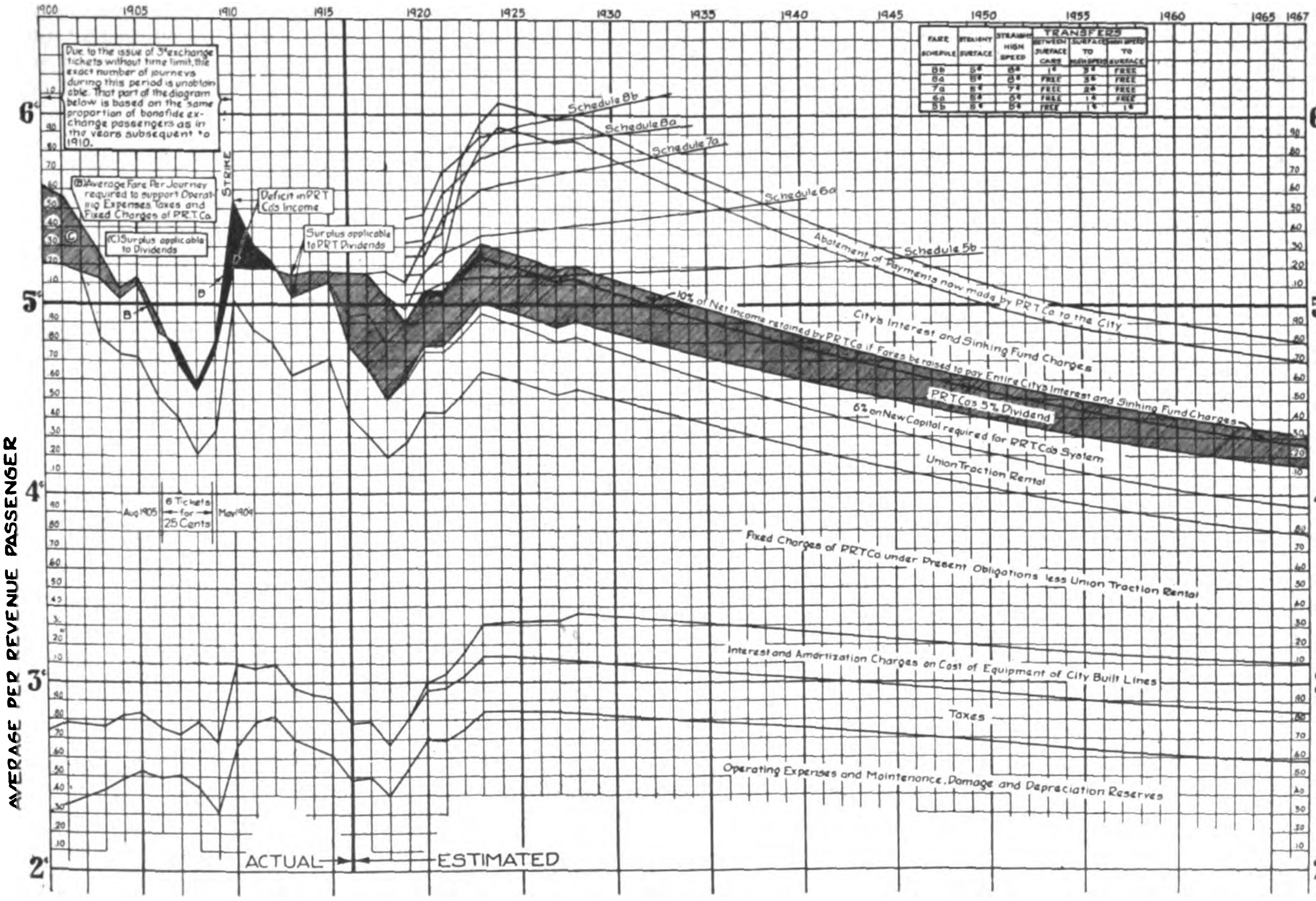
WHAT THE P. R. T. PROPOSED

The proposal made by the company was based upon a financial as well as a physical unification of the old and new systems. The gross receipts were to be applied to the payment of (1) the actual cost of operation of the combined systems; (2) the fixed charges of the company; (3) a cumulative dividend of 5 per cent upon the paid-in capital stock, and (4) a division of the remaining net surplus, 10 per cent to the company and 90 per cent to the city, for the city-built lines.

Under this plan the system would be operated with a 5-cent fare, and universal transfers except in the delivery district, but provision would be made for such readjustments of fare at any time during the term of the contract as might be necessary to protect and secure the return to the company as specified above and necessary and advisable in the interests of the city for any unforeseen reason or contingency. The 5-cent fare base could be changed only by order of the Public Service Commission, but after any semi-annual statement a charge for transfers could be instituted by the company without such an order.

PREFERENTIAL PAYMENT IS CRITICISED

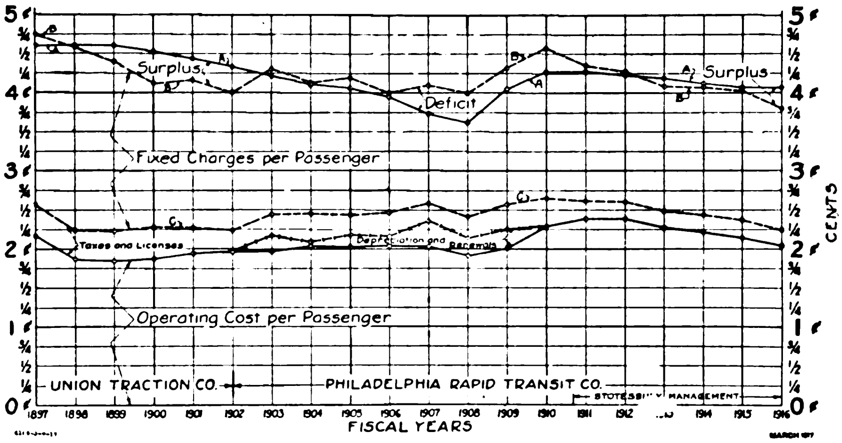
According to Mr. Twining, the company's proposal is in reality the reverse of what it appears on the surface. It is in the form of a lease, but instead of the city's lines being rented to the company at a real cash rental, the city is placed in the position of another "holding



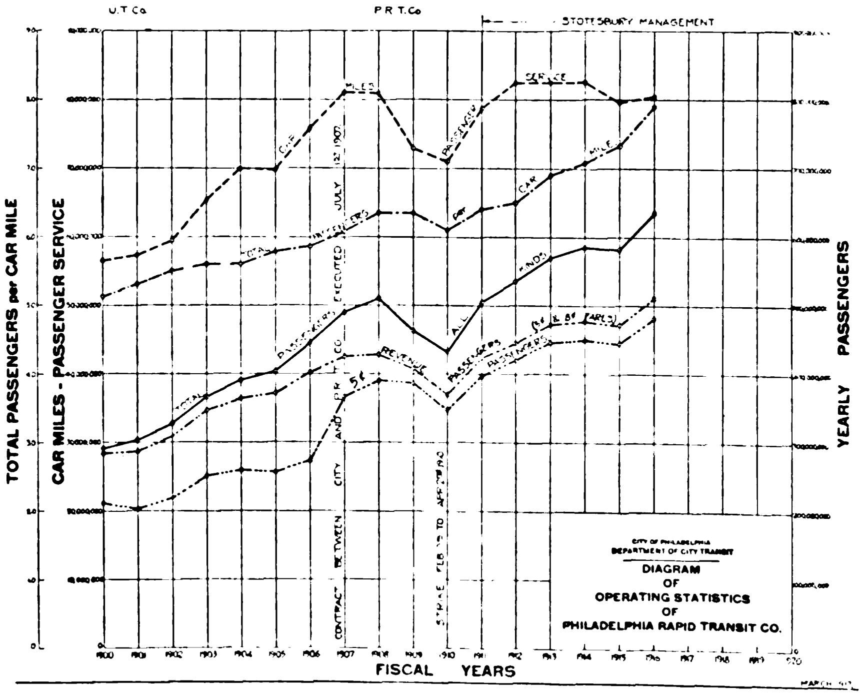
FARE SCHEDULE	STRAIGHT SURFACE	STRAIGHT HIGH SPEED	TRANSFERS BETWEEN SURFACE CARS	TRANSFERS SURFACE TO HIGH SPEED	TRANSFERS HIGH SPEED TO SURFACE
8b	5¢	8¢	1¢	3¢	FREE
8a	5¢	8¢	FREE	3¢	FREE
7a	5¢	7¢	FREE	2¢	FREE
6a	5¢	6¢	FREE	1¢	FREE
5b	5¢	5¢	FREE	1¢	1¢

COST OF SERVICE AND PASSENGER REVENUE AT VARIOUS FARE SCHEDULES PER REVENUE PASSENGER BASED ON ESTIMATED PROBABLE FINANCIAL RESULTS OF THE PHILADELPHIA UNIFIED SYSTEM, AS COMPILED BY FORD, BACON & DAVIS company," leasing the existing system of the Philadelphia Rapid Transit Company, guaranteeing a certain definite cash rental to its present owners, and taking for its share of the earnings and the return on its investment only what is left after all payments are made for the use of the company's property. Thus the real consideration runs from the city and not to the city.

The preferential payment asked by the company, it is said, is based in the main upon an entirely different principle from that of the New York preferentials.



(a) Total revenue per passenger. (b) Total cost of transportation per passenger. (c) Total operating expenses and taxes per passenger.



DIAGRAMS SHOWING OPERATING STATISTICS OF PHILADELPHIA RAPID TRANSIT COMPANY

The proposed Philadelphia preferential is mainly for the purpose of protecting the company against loss in net income. The New York preferentials were devised to make the pooling of revenue practicable and to establish the company's credit so that about 50 per cent of the new capital could be obtained through the companies. The companies are protected in very little degree against loss by reason of traffic diverted, although the bulk of the loss will fall on the contracting parties through subsidiaries. In Philadelphia, however, although the city would be supplying 78 per cent of the capital required, extraordinary protection and preference are demanded for that part supplied by the company. In Mr. Twining's opinion there is no established principle warranting the compensation of a street railway for diverted business or loss in income caused by competing lines.

WHAT HAS CAUSED INCREASE IN COMPANY'S SURPLUS

The principal concession of the company is that it is accepting a fixed rental of $1,500,000 per year, whereas in the current fiscal year its earnings are estimated to be more than $2,500,000. In Mr. Twining's opinion, however, the city should not treat this as a concession until it has confirmed the company's statement of earnings by accepted standards of service and maintenance. Moreover, caution should be exercised in basing a rental on results of this year of unexampled activity in all lines.

According to the company's reports, there has actually been earned available for stock distribution during the fourteen years ended July 1, 1916, a net cumulative surplus of only $1,180,000. From 1902 to 1911 a total of 186 miles of operated track was added to the system, but since 1911 only 17 miles of surface track have been added. The company's present earnings, Mr. Twining asserts, apparently show a profit, but this is the result largely of (a) abnormally heavy riding due to general prosperity; (b) service below standard requirements, and (c) an almost complete cessation of expansion of the system. The diagram opposite shows that the car mileage operated in 1915 and 1916 was lower than at any time since 1911, while the number of passengers per car-mile was the highest in the company's history.

THE QUESTION OF FARE

On this point Mr. Twining objects that although the city is expected to provide the larger part of the needed capital the company does not guarantee or even hold out bright prospects of a 5-cent fare with universal transfers, which the citizens were led to expect. Mr. Twining admits that the established rate of fare will not meet the demands of the present system, as now constituted, and carry the city program as well, but the city is not willing to agree to such a fare increase as would benefit the company, for the present fare would be ample for the company's needs if it were not overcapitalized. Its fare adjustment plan is considered especially unfair in that it gives the company absolute control over not only the amount but also the method of application.

MISCELLANEOUS CRITICISMS

If the city should be in the position of residuary payee, Mr. Twining believes that it should have the right to approve or disapprove the company's method of raising new capital. Furthermore, definite provision should be made for the amortization of new capital invested in the company's system.

Under the company's plan, Mr. Twining says, satisfactory control of service is not provided. Although the lease provides for a unified system, practically all references to control apply either directly or indirectly to the high-speed lines only. It is felt that the city should have a potent voice in the operation of the company's system as well as of the city's system, and in the expenditure of money therefor. An effective method of control by the city of operation, fare, service and facilities should be provided in the contract.

The term of the lease contemplated in all negotiations and proposals has been fifty years, that being the specified term of the 1907 contract. It is proposed to extend the 1907 contract by the period that has already expired, namely, ten years, making this co-terminous with the lease of the new lines. Mr. Twining feels it exceedingly doubtful, however, that the time limit should be absolutely fixed, and makes a recommendation that an indeterminate provision be incorporated in any contract for Philadelphia.

DIFFICULTY OF FIXED CHARGES

Mr. Twining avers that one of the chief difficulties confronting the city in dealing with the company is the comparatively high fixed charges of the company. The company does not tend to readjust the present transit situation and simplify or remedy the financial mistakes of the past generation. These originated in the methods used to bring all the original fifty or more separate companies under one management and control by successive leases, each lessee agreeing to pay larger rentals until the amount now aggregates $7,300,000 annually, or more than 28 per cent of the gross revenue. Now, it is said, the company desires to add another lease to the present complex tangle and makes no suggestion as to any reorganization or plan of readjustment.

The diagram opposite gives the income distribution for the Philadelphia and the Boston systems in 1916. According to Mr. Twining, the Boston system has been conservatively financed, and the capital charges of the Boston surface system represent approximately only one-half the burden being carried by the Philadelphia surface system, being 1 cent in Boston, as compared with over 2 cents per revenue passenger in Philadelphia. This difference of 1 cent per passenger in fixed charges would have amounted to $4,810,000 in 1916, or enough to carry practically all the cost of the city's program.

SUGGESTIONS FOR A PROPER CONTRACT

After stating his objections to the Philadelphia Rapid Transit Company proposal, Mr. Twining mentioned the following as some of the essential features of a fair contract between the city and the company:

1. The company shall, if possible, adopt a program which will ultimately effect a readjustment of its finances by refunding or other approved means, and the city shall readjust its program of construction so as to bring the estimated deficit within reasonable limits as recommended by the report of Ford, Bacon & Davis.

2. The city shall not guarantee the company's system as to capitalization, management or operating results in any way, either directly or indirectly.

3. As the gross and net earnings of both the city's and the company's systems fluctuate from year to year and depend upon factors beyond the city's control, any payment to the company for its co-operation should not be based on gross, net or diverted earnings of either system, but should be, if at all, a payment based on the extent to which the company really co-operates in the city's program. In determining its amount the city shall recognize the company's obligation to be responsible for the result of capital investment in the rapid transit facilities at a normal rate.

4. The payment or fee to the company for acting as manager or operator of the city's system shall not exceed the amount which would be paid for the same service under independent operation, and preferably graded and proportional to the relative gross earnings of the two systems.

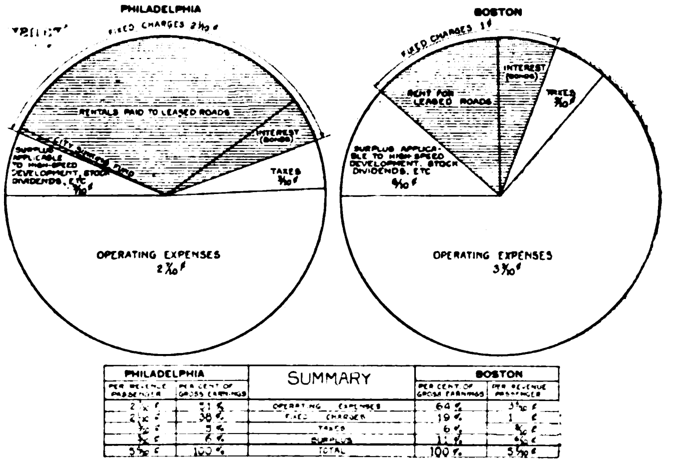
5. The city's system shall be operated for the city's benefit. Physically the company's and the city's systems may be operated as a unit, but financially they must be kept separate, each system to count as its earnings whatever cash it receives on its lines—it may be assumed that the transfers will balance each other.

6. The city may equip as well as build its own high-speed lines, thus owning outright its own system complete. This provision is not a necessity if the company will furnish the equipment on fair terms, but it will obviate any necessity for the company to make use of the city's guarantee on its operating results in order to finance the equipment of the city's lines. It also makes it possible for the city to take over a completely equipped system if it should decide to recapture its own system at any time.

7. The company's system of surface lines shall be financed by the company and the company must not be permitted to use the city's credit either directly or indirectly, but must stand on its own feet, and stand or fall as a result of its own management and acts.

8. The city must be left free to regulate the company's service under the Public Service Commission.

9. Change of fare or charge for transfers, etc., to be left to the Public Service Commission, but no increase is to be [illegible] for the company's benefit until the city's capital is treated as well as the company's.



PHILADELPHIA		SUMMARY	BOSTON	
PER REVENUE PASSENGER	PER CENT OF GROSS EARNINGS		PER CENT OF GROSS EARNINGS	PER REVENUE PASSENGER
2 7/10¢	51%	OPERATING EXPENSES	64%	3 4/10¢
2 1/10¢	38%	FIXED CHARGES	19%	1¢
3/10¢	5%	TAXES	6%	3/10¢
3/10¢	6%	SURPLUS	11%	6/10¢
5 4/10¢	100%	TOTAL	100%	5 3/10¢

DIAGRAM OF DISTRIBUTION OF INCOME ON PHILADELPHIA AND BOSTON SYSTEMS

10. The contract of 1907 to be modified as little as may be necessary to correspond with conditions of this contract. Payments now due the city thereunder not to be abated or modified. The company to cancel all claims on unearned and unpaid dividends cumulative since 1907, and change the date so that 6 per cent dividends may be cumulative from date of the contract.

11. The term of the contract shall be fifty years or preferably of indeterminate length, with provision that the city may recapture either its own system, or both systems, at any time, after due notice, upon stated terms.

In conclusion, Mr. Twining said:

"These suggestions aim to prevent the company from placing on either the taxes or the fare any burden not due directly to the city's program, and to prevent the company using the city's credit for its private advantage. Instead of guaranteeing the results of the company's co-operation and participation in the city's program to an uncertain extent, as the company's plan proposes, this plan proposes no guarantee of any kind to the company. Instead, it places a certain definite and fixed limit on the burden to be placed on the company by the city, this burden representing the company's obligation to the city in return for its position as a monopoly. The present draft as submitted by the company does not fully meet any of these essential features, and in underlying principles which govern and determine the terms and form of the contract it is radically different."

ENGINEERS PREDICT DEFICIT

The previously mentioned report of Ford, Bacon & Davis indicates that operation of the system under the transit company's proposal would mean a large annual deficit. The report asserts that under the company's offer an investment by the city of $87,300,000, with a 5-cent fare and free transfers, would after 1921 and for the first fifteen years of complete operation result in an average deficit of between $4,000,000 and $5,000,000. This large operating deficit is caused principally by the following: (1) The proposed outlay for transportation facilities is to be made within a period shorter than that necessary for a proportionate growth of population and traffic. (2) In the early years of operation the new high-speed lines will largely duplicate the service of present surface lines. (3) The present revenue from exchange tickets is abolished.

Under the terms of this proposal and with a 5-cent rate of fare, and with financial results an average between the maximum and minimum estimated limits, the city will not begin to receive net income to apply to the payment of interest and sinking fund charges upon city bonds issued for transit development until about ten years after the commencement of operation in 1921 of the transit lines. The city will receive the full amount of its interest and sinking fund charges in about twenty-five years after the commencement of operation in 1921. The cost of service and the revenue per passenger at various fare schedules, as estimated by the engineers, are shown in the diagram on page 643.

METHODS OF PROVIDING FOR DEFICIT

Ford, Bacon & Davis state that the entire amount of the deficits can probably be provided for directly in only one of two ways: (1) An increase in the tax rate amounting, as a maximum in 1926, to about 25 cents per $100, and gradually disappearing thereafter. (2) A charge in 1922 of a 6-cent fare on both high-speed and surface lines, with free transfers, or an alternate charge of 8-cent fare on high-speed lines and 5-cent fare on surface lines, with universal free transfers.

Of these two methods of providing for the deficit, that of raising the rate of fare to equal the cost of service, it is said, would seem to be fairer to the public and better economically. It places the cost of a car ride directly upon the passenger rather than upon the owner or renter of real estate. From an economic standpoint, the fixing of rates of fare that will pay the interest and sinking fund charges on the city's bonds is desirable, as it will make these bonds self-supporting and thus exempt them from the debt limit. The city, in such event, would have the ability to issue $87,300,000 of additional bonds for further subway construction, port development or other purposes.

HOW PREFERENTIAL SHOULD BE HANDLED

With reference to the propriety of the city granting the company a preferential payment to represent its existing net income before the payment to the city of any of its fixed charges, the engineers state:

"We believe that the history of rapid transit development in large American cities, especially New York, shows the desirability of some such provision where extensive developments are undertaken. This preferential, virtually guaranteed by an automatic increase in rate of fare by a charge for transfers, is more favorable to the company than the fixed preferential depending upon a fixed rate of fare provided for in the New York contracts. If an automatic increase in fare be permitted in the agreement, we believe that the city's investment should fairly rank on a parity with the company's stock, instead of the dividends on this stock being paid before any payments are made to the city. If this automatic increase in fare be eliminated from the agreement, we believe that the company is fairly entitled to include in the preferential a dividend on its stock. Without a study of the service of the company, and until an opportunity is had of analyzing the audit now being made, we cannot advise whether such dividend should begin at as large a rate as 5 per cent on $30,000,000."

The sinking fund charges on city bonds, it is added, or the portion of such charges equivalent to a proper depreciation reserve, should be deducted from net earnings before the company's dividend is deducted.

INCREASE IN THE PROPOSED DEVELOPMENT

An interesting statement of the progressive enlargement of the rapid transit program with increase of cost and anticipated deficit to the city is shown in the following table of the engineers:

Year Estimate Was Made	Estimated Cost of Construction	Estimated Maximum Deficit of City at 5-Cent Fare	First Year Showing All City Charges Earned
1913	$51,916,000	$1,280,000	1927
1914	54,002,000	1,866,000	1935
1915	67,088,000	2,655,000	1941
1915 (revised)..	64,420,000	2,181,000	1939
1917	87,300,000	*5,157,000	1955
	....	*4,488,000	1941

*Maximum and minimum limits.

This table, it is stated, shows clearly the increasing liability to the city which has been involved in the progressive development of the rapid transit program. If the city desires to keep within its immediate resources for rapid transit, it can, without relinquishment of its ultimate purpose, defer about $22,000,000 of construction work until more practicable financially, under which condition the remaining cost of construction, about $65,000,000, would be provided for by the funds already voted for transit development.

HOW TO SOLVE THE PROBLEM

In the opinion of Ford, Bacon & Davis, a businesslike method of handling the problem now presented to the city is comprised in the following plan:

1. Cut the program of immediate construction of rapid transit lines as nearly as practicable to the amount of the appropriation.
2. Defer for a period of lower prices such portions of the construction as will not interfere with the value of the rapid transit system to the public.
3. Devote to the payment of fixed charges on the city's investment in rapid transit such part as practicable of the abnormal increase of taxes on real estate caused by rapid transit development.
4. If there should still remain a deficit in the payment of the city's interest and sinking fund charges on cost of construction, increase the fare in order to make the undertaking self-supporting; first, by a charge for transfers between high-speed and surface lines; or, second, if this be not sufficient, by charging 6 cents on high-speed lines with a 5-cent fare on surface lines; or, third, by charging a uniform 6-cent fare on both high-speed and surface lines.
5. Formulate a working contract embodying the foregoing changes and guarding the city's interests in the particulars mentioned.

The New York Railways have with the approval of the City Health Department given up the use of patented disinfectants in their cars. Instead the cars are dusted every day and the floors thoroughly scrubbed. The woodwork, ceiling, windows, seats, etc., are washed once in two weeks.

American Association News

Committee on National Defense Perfects Plans for Mapping the Electric Railway Lines to Assist National Government in Military Operations—Biographical Sketches of Denver Tramway Section Officials—General Activity in the Company Sections

National Defense Committee Meets

Frank R. Ford, L. S. Storrs and C. Loomis Allen of the committee on national defense of the American Electric Railway Association held a meeting on Wednesday, April 4, at which time the general plans as agreed upon at previous meetings were perfected in regard to the preparation of sample maps and data blanks for listing electric railway physical property. It is expected that these sample maps and the data sheets that will accompany them will be sent to the vice-chairmen of the committee for distribution among the electric railway companies in the various districts into which the country has been sectionalized.

Denver Tramway Section

The accompanying half-tones are portraits of the president and the secretary of the Denver Tramway Company section, respectively W. H. McAloney, superintendent of rolling stock, and H. G. Mundhenk, chief clerk of the transportation department.

Mr. McAloney has seen twenty-six years of cable and electric railway service, starting in the work as a conductor in the days when the motive power was transmitted by cable in Denver. From the platform of a car he was transferred to the then small stores department and master mechanic's office. At that time E. W. Olds, later of Milwaukee, had charge of the shops, and Mr. McAloney resided with Mr. Olds. Later he put in about a year and a half as assistant division superintendent, but in 1896 returned to the present Broadway shop, where he worked continuously. He was appointed to his present position in 1902. Under Mr. McAloney's care the company's equipment is noted for its good condition and uniform appearance, and Denver is said to have fewer types of apparatus than many other cities. Under his direction the local company section is enjoying meetings with record-breaking attendances.

W. H. MC ALONEY
President Denver Tramway Company Section

H. G. MUNDHENK
Secretary Denver Tramway Company Section

Mr. Mundhenk is now serving his fifth term as secretary-treasurer of the section. He is also serving his fifth term as secretary of the Central Tramway Club, an organization with a membership of some 300 employees. His standing among his fellow employees has been securely cemented through his interest in their welfare, while his own rise from stenographer to chief clerk in the transportation department bespeaks his standing with the company in whose employ he has been since 1906.

Mr. Mundhenk is a graduate of the Denver high schools, a member of the class of 1908, Colorado State Agricultural College, and a student of the same year in Wisconsin State University. He has worked hard for the success of the section since shortly after its organization in 1912.

Original Musical Comedy Produced at Milwaukee

An audience estimated at 800 gathered on March 17 to witness the presentation of an original one-act musical comedy entitled "Garden of Romance" by employees of The Milwaukee Electric Railway & Light Company. The talent was well distributed among all departments. After opening remarks by A. E. Wallace, president of company section No. 1, some moving picture films on steam road electrification were shown by A. B. Cole, general manager of railway publicity Westinghouse Electric & Manufacturing Company. The presentation of the play was followed by dancing.

Connecticut Company Section

At the fourteenth meeting of section No. 7, held on March 14, William Arthur of the staff of McHenry & Murray described his power-saving recorder which is being installed on the cars of The Connecticut Company. He explained the working of power-saving devices in general and offered some interesting data on what other companies have saved through the use of such devices.

Lesley Spraggon, inspector of equipment for The Connecticut Company, spoke on "Economies in Railway Operation as Effected by Improvements in the Design of Equipment." He compared present types of car equipment, including those used by the local company, with earlier types, illustrating the progress that had been made in design.

The secretary's report showed that the section now has a membership of 254. The attendance at the March meeting was 101.

Section No. 2 Meets in Camden

A total of 240 men attended the meeting of the Public Service company section held in Camden, N. J., on March 22. The meeting was held there rather than in Newark for the convenience of the men of the Southern Division. R. E. Danforth, general manager, gave a comparison of the operating expenses of the company for the years 1915 and 1916. He illustrated the present high costs of labor and materials, urging upon all the practice of economy. As examples of the possibilities in this line he said that much could be done in reducing accidents, and if every motorman would do his best to operate his car properly, using as much coasting as possible, the sum of $150,000 could be saved.

J. E. Babcock, division claim agent, supplemented Mr. Danforth's remarks on accidents by calling attention to the increasing number of "unreported" accidents which are very troublesome to the claim department when the time for settlement arrives. W. B. Graham, division superintendent, drove home the thought of economy, important in private life and in the interest of the company.

Aeronautics Discussed at Chicago

The speaker at the regular monthly meeting of the Chicago Elevated Railroad Company Section, held on March 27, was Capt. Horace B. Wild of the United States Aeronautical Reserves. The captain first gave a history of aviation and then transported his hearers to the European war zone for the purpose of illustrating the practical uses that have been made of the several styles of air craft. The attendance at the meeting was 110.

Toledo Section Inaugurates Educational Work

The joint company section of four national societies recently formed in Toledo has now been established in permanent quarters, consisting of six rooms in a centrally located building. Within the past few days class work has been begun in elementary electricity, arithmetic, drawing, algebra, accounting, and gas. The group work committee announces that classes will be formed to study any desired subject, and that visitors are always welcome at class meetings.

At the meeting held on March 23 there were a number of entertainment features provided by local talent, and Henry L. Doherty and Chairman T. J. Nolan addressed the section.

Manila Section Assigns Topics

At the meeting of joint company section No. 5 held in Manila on Feb. 13, a paper by F. P. Santiago, on "Prevention of Accidents" was read. An abstract of this paper and the discussion will appear in a later issue. A comprehensive schedule of future papers was also presented by the program committee.

The schedule of papers comprised a list of names of speakers with dates on which papers are to be completed, as well as assignments for papers to be completed by May 2. The latter list is as follows: "All About Meter Reading; Beating and Its Detection," by Francisco Santiago; "How to Meet a Customer," by W. A. Seten; "Rates and Rate Making," by J. C. Rockwell; "Management," by C. N. Duffy; "System," by J. W. Earle; "Relation Between the Auditing and Other Departments," by D. M. Shaw; "Menace of the Transfer," by I. G. Obligacion; "Coasting Habit," by F. Pilapil; "Trainmen as Witnesses," by M. Fariflas; "Electrical Energy Derived from a Pound of Coal" (illustrated), by B. H. Blaisdell; "Medical Department," by the company physician.

The Central Electric Railway Accountants' Association has issued its 1917 Red Book, containing the lists of officers and members, an index of accounting forms on file in the secretary's office, a synopsis of decisions and recommendations in regard to interline accounting, an index of papers and committee reports previously published, the full text of papers before the Toledo meeting in June, 1916, and the president's address in Cincinnati in December, 1916.

COMMUNICATIONS

Setting Trolley Poles with a Rake

THE AURORA ELGIN & CHICAGO RAILROAD COMPANY
AURORA, ILL., March 16, 1917.

To the Editors:

The writer read with much interest the article by J. G. Koppel which appeared in the ELECTRIC RAILWAY JOURNAL of Feb. 17, 1917, on setting trolley poles with a rake. Mr. Koppel has opened up a subject that should bring out considerable argument.

"From time immemorial" trolley supporting poles that have been subject to any side strain have been set with a rake, and the engineer who launched the idea probably had a very good reason or it would have perished long before this.

On almost every property one finds poles set with a rake of from 4 in. to 4 ft. A line gang will invariably rake a pole and will sometimes overstep the specification in this respect. It is a custom handed down to each man as he takes up that particular trade. Most work on the pole is done on the side away from the rake and it is easier to work on a raked pole than it is on a vertical one.

One hears the question time after time "Why the rake?" and each person asked has a different reason. To my mind there is nothing finer in appearance than a pole line carrying wires set plumb and in a true line. It manifests an interest by the erector in symmetry and order and good workmanship. But take this same line of poles and attach span wires to them and one immediately changes their appearance. They appear to lean toward the street although still perfectly plumb. If the span wires were level I doubt if they would give this appearance to the poles, but they slope down at an angle of about one in ten and this, I believe, is what gives the illusion of the poles leaning toward the street. A pole for supporting the span wire only, set vertical, has the same appearance as one forming part of a pole line, but a slight rake changes the whole appearance and to my mind improves it.

The writer recently set a line of 30-ft. poles on one side of a street for trolley span construction and joined a telephone company in the erection of the line of poles on the opposite side of the street. The 30-ft. poles were set with a rake of 6 in. and the joint poles were set vertical as the telephone company's engineer objected to the rake in poles. These joint poles to-day have the appearance of leaning to the street, whereas the poles set with the rake present a more pleasing appearance.

It is true that some engineers go to the extreme in raking poles and this I believe gives a bad appearance to a line. The Engineering Manual specifies the degree of rake that, to my mind, gives the best appearance to a line.

From the above one might assume that poles are raked for appearance only, but there is another reason that affects the operating costs. As far as supporting the trolley wire at the proper height is concerned it matters not which way a pole leans, provided it supports the wire. But in setting poles along streets one is at least morally bound to install them so that they will be a credit to the city, and the company, and also will require the least expense to maintain them in that condition. Poles set with a rake do not require attention nearly as soon as those set vertical, as the raked pole has farther to go before it presents the appearance of leaning toward the street.

Guyed poles are raked only to line them up with poles not guyed. A guyed vertical pole has practically the same strength as a guyed raked pole unless the rake is carried to a great degree. Steel poles, including those carrying ornamental lamps, should be set to have a rake of 3 in. to 4 in. when the side strain is on them.

Finally, raking a pole gives it the appearance of life, as if it were actually performing a duty, whereas a vertical pole suggests no action.

SAMUEL E. JOHNSON,
Superintendent of Substations and Lines.

Conference of Publicity Agents

DETROIT UNITED RAILWAY
DETROIT, MICH., April 2, 1917.

To the Editors:

As a publicity agent I am naturally interested in the proposed roundtable at St. Louis during the annual conference of the Associated Advertising Clubs of the World and hope to attend if the date does not conflict with that of the June meeting of the Central Electric Railway Association. It does not appeal to me, however, that any steps should be taken now or at that time that would tend to divert our particular field of endeavor from the various electric railway associations with which our companies are affiliated.

In ordinary commercial life publicity consists of pretty booklets, paid newspaper space and the like. To a marked degree the advertising man secures in return some complimentary notices the frequency and length of which depends to a very large extent upon the size of the contract.

Here, then, we have the advertising selling the article with the advertising managers of the press helping out and obtaining for their respective organs *quid pro quo.*

Selling car rides through the force of advertising is very important, but the natural monopoly of the transportation industry does not call for the expenditure of money and organization as in ordinary commercial life. Ours is a greater and more complex work than that. It is a work of public relations. It is the task of letting the public know the "how" and "why" as against the misinformation of the vicious and the ignorant.

While many street railway companies have not yet seen the full light of day concerning not only the advisability but also the necessity of publicity in its larger sense, yet every year the list is growing. The phase of the transportation business to which we are attached is becoming more and more important. By its very nature these publicity departments are related to the officers, to the master mechanics, to the track men, to the electrical department and to the operating department. This must be the case in order that we may talk or write promptly and intelligently.

Holding these views it appears to me most necessary that we become more and more concerned in the meetings of the regular electric railway associations, national and sectional. While we have distinctive work to do it is no more distinctive than other branches of the service.

I think it is generally known that I have long argued for more recognition of our work in our conventions, and I have urged on every occasion that at the national conventions distinctive sessions be held in which to discuss our distinctive work. This ought to be done and, of course, will be done just as soon as the managements of the properties make known their views to the national officers.

A. D. B. VAN ZANDT,
Publicity Agent.

"Safety Cars" in Canada

THE THREE RIVERS TRACTION COMPANY
MONTREAL, March 30, 1917.

To the Editors:

We have read with interest the article on "One-Man Operation" on page 492 of the current issue of the JOURNAL. The author of the article speaks of the desirability of referring to what are now commonly known as one-man cars by a different designation, his idea being that the public is apt to get a wrong impression from the words "One-Man Car."

Our company has used this type of car since the road was built and has found the cars admirably suited for the business which is done in a town and district of about 25,000 inhabitants. The term "safety car," which has been suggested as a name for them, describes their performance on our lines, and we believe that such a name could well be generally adopted to designate this type of car. W. S. HART, Secretary-Treasurer.

"Get Acquainted with the Street Car Service"

Under the above caption the City Light & Traction Company of Sedalia, Mo., recently ran a series of large advertisements in the local newspapers and afterward reprinted these in a paper-covered booklet 10 in. x 12 in. in size. The booklets were distributed throughout the city, one to each house, and since this was done, a few weeks ago, there has been evidenced a considerable increase in good-will toward the company and more electric railway business. The company plans to repeat this procedure in connection with an ice campaign by the ice department preparatory to the hot weather trade in that commodity.

The topics of the advertisements were: An introductory statement explaining the plan; a statement regarding the car equipment and the cost of operating cars, the latter being $22.50 per day; a discussion of accident prevention; a brief description of the power plant; a picture of the office with a brief statement of its plan; some facts about the personnel of the transportation department; technical information regarding the track and track maintenance; an explanation of where the cars are kept at night and what is done to them then; a query as to the economy of using automobiles in traveling to and from work; a statement on safeguarding grade crossings; some information regarding overhead construction, and a general concluding statement as to the policy of the company. All but the opening and concluding advertisements were illustrated with halftones. This campaign was under the direction of A. B. Irelan, manager.

Boston Elevated Patriotic Meeting

At a meeting of several thousand car service employees of the Boston Elevated Railway, held in Tremont Temple on Thursday evening, April 5, under the auspices of the local division of the Amalgated Association, addresses were given by representative men from several fields of activity. In his address President M. C. Brush said, among other things:

"We can be of service to our country in our daily contact with the public. You men who are serving on the cars and carrying men to the Watertown arsenal are as essential as the men at the machines in the arsenal itself. There is going to be confusion at the beginning, but if the spirit is right the mistakes will be those of judgment and not of heart. No man who leaves the service of the company to enter the service of the government will suffer in any way because of his absence."

Practical and Economical Solutions of Problems in

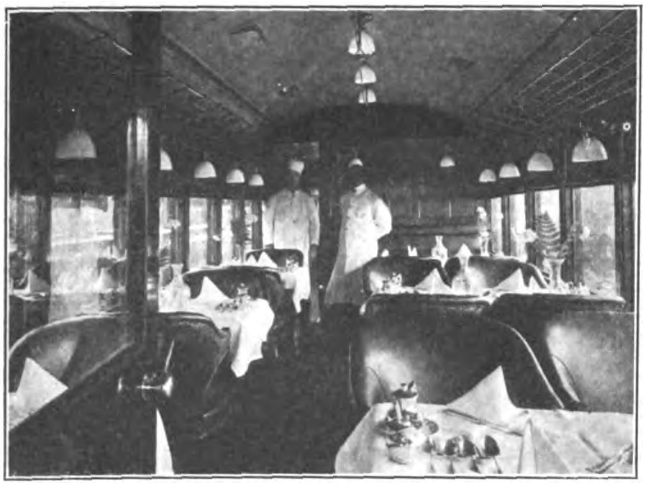
EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

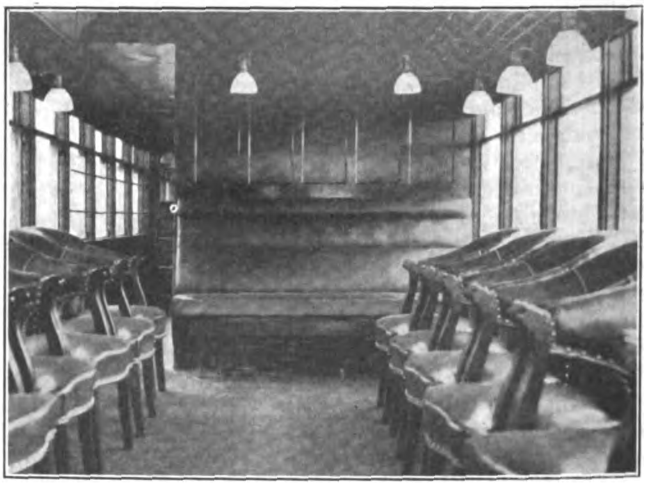
Chicago-Milwaukee Line Begins Dining Car Service

Combination Parlor and Dining Cars Installed as Part of Limited Service Equipment Between the Two Cities

The Chicago, North Shore & Milwaukee Railroad, operating thirty high-speed limited trains each day between Milwaukee and Chicago, has begun the operation of a special de luxe train called the Gold Coast Limited, which leaves Evanston, Ill., at 12.15 o'clock daily and includes as part of its equipment a thoroughly complete dining car service. The initial run of this train was made on March 31. The dining car service was begun without advertising in order that it might be gradually brought into use and any difficulties worked out before the service was announced widely.



INTERIOR OF CAR ARRANGED FOR DINING SERVICE



INTERIOR OF CAR ARRANGED FOR PARLOR CAR SERVICE

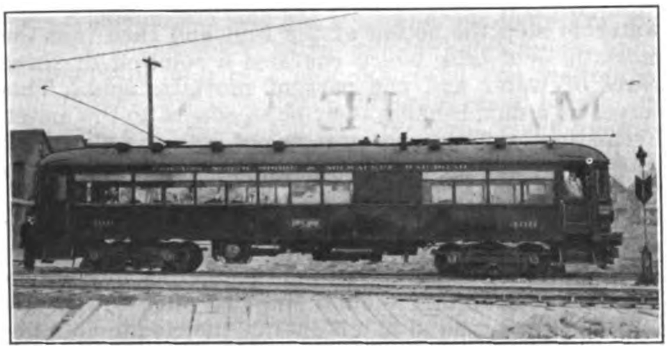
To obtain the greatest utility from the car, it was designed to serve as both a dining car and parlor car. By this means it is possible for the car to make a trip as a diner, leaving on the 12.15 run from Evanston, and return as a parlor car and be ready to leave Evanston again serving as a diner for the dinner-hour run. This change from dining car to parlor car is made simply by taking out the tables and storing them in a cabinet provided for the purpose and rearranging the chairs. The plan of the car both as a diner and as a parlor car was shown in ELECTRIC RAILWAY JOURNAL for Jan. 13, 1917, page 84.

A former chef from the Santa Fé de luxe train and experienced dining-car waiters have been employed. The kitchen is equipped with a coal range, charcoal broiler, 250-lb. capacity ice box, a provision cabinet sufficient for sixty persons, dishes for thirty persons at one sitting, pastry board, 3-gal. coffee urn, a combination sink with hot and cold water, etc. Thus the road is prepared to give a dining car service which will compare favorably with that offered on competing steam lines. The diner will take care of twenty-four people at one sitting.

When operated as a parlor car a charge of 25 cents a seat regardless of the distance traveled will be made. This favors the through traffic, which is the class of business for which the company is now making a special bid in connection with its one hour and fifty-six-minute limited service between Evanston and Milwaukee. No fare register is provided in the combination diner and parlor cars. The train conductor is held responsible for the collection of fares on the car, while the parlor car conductor takes the seat fares. When the car operates as a diner this conductor serves as steward of the dining car and is responsible for the dining service and the reports of all articles and meals sold. He is also a regular conductor in the company's service, and hence is familiar with all operating details. This arrangement was adopted since it costs only a few cents an hour more to have a regular conductor than to provide simply a trainman on the parlor or dining car in accordance with the Interstate Commerce Commission's requirements.

With the exception of the interior arrangement the design and equipment of the three new dining cars is practically identical with the standard steel cars previously in use by this company. These three diners are part of an order for fifteen cars of the same general design, which includes five passenger cars with a smoking compartment and seven combination baggage and passenger cars, all built by the Jewett Car Company.

The dining cars are 56 ft. long over all and 8 ft. 8 in. wide. This comparatively narrow design was made necessary in order that the cars might ultimately be operated over the elevated structure into Chicago. For the same reason the platform was narrowed off considerably and the truck mounted fenders were cut away at the sides in order to clear the third-rail as shown in one of the accompanying photographs. The cars are constructed practically entirely of steel except for the



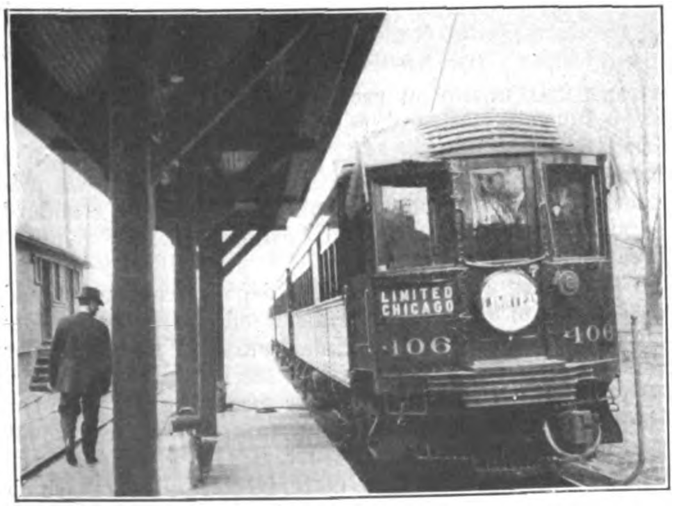
CHICAGO-MILWAUKEE COMBINATION DINING AND PARLOR CAR

interior, which is finished in mahogany. The headlining is of steel and is painted with a buff-colored vitrolite enamel thoroughly rubbed to remove the polish and eliminate the glare from the artificial lighting.

One of the principal features of the dining car interior is the special lighting arrangement. This includes ten lamps through the center of the car and lamps on the side posts, one over each table. The lamps are of 23-watts with heavy density opal reflectors and are mounted in specially designed fixtures furnished by the Chicago Safety Car Heating & Lighting Company.

The tables and chairs are of solid mahogany to harmonize with the interior car finish, the latter being upholstered and covered with Fabrikoid. The floor is covered with battleship linoleum, over which is a green carpet. Suitable ventilation is provided by five intake and seven exhaust ventilators of the Railway Utility Company manufacture. These intake ventilators are so arranged that the opening into the car directs the incoming air across the headlining and thus prevents any draft from striking passengers. These openings are also located so as not to be opposite the exhaust ventilators in order to avoid a direct current of air into and out of the car. The ventilation in the kitchen is provided by a motor-driven exhaust fan and special ventilators.

The dining cars are equipped with motors and multiple-unit control so that they may be operated as one unit of a train in the regular service, or used for special parties desiring to charter a car with the dining-car privileges. The equipment includes four Westinghouse 557 A-5 motors mounted inside hung on Baldwin trucks with 84-in. wheelbase, and with Westinghouse HL control arranged for double-end operation. The brake equipment is the General Electric combined straight and automatic air with Westinghouse Type M triple valves. The cars weigh approximately 90,000 lb.



GOLD COAST LIMITED TRAIN WITH DINING CAR ON REAR

Coil-Winding Machine Made from Old Turret Lathe

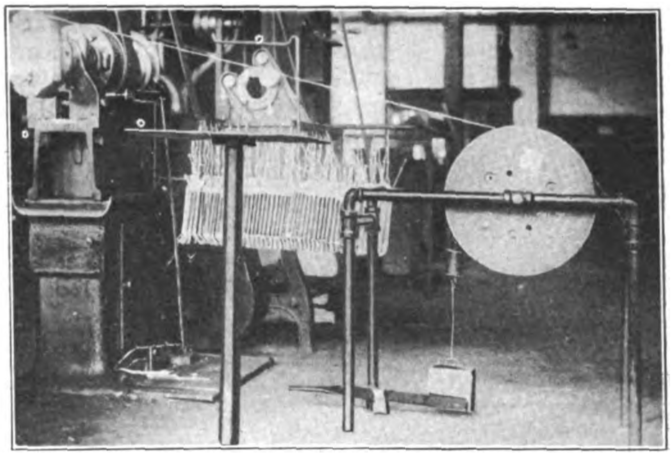
Home-Made Outfit Reduces Expense of Winding Coils, and the Buying of New Apparatus Is Avoided

BY J. S. MILLS

Foreman Electrical Department, Morris Park Shops, Long Island Railroad

This company manufactures all the small armature coils which it uses, and about a year ago it became necessary to rewind a great many old compressor armatures. This meant obtaining a coil-winding machine or using more help to wind the coils by hand. Instead of purchasing new apparatus, an old Jones & Lamson, 2-in.-bar friction-head drive, turret lathe which was too badly worn to be used in the machine shop was fixed up and used successfully as a coil-winding machine.

The lathe bed was cut off flush with the pulley-cone bearing so that any form on which a coil is to be wound can be fastened to the face of the spindle and driven without striking any part of the lathe. The three-cone pulley and the friction drive in the lathe head provide a range of six speeds. To provide a means of starting and stopping the machine by a foot control so that the operator can use both hands for guiding the wire, etc., the original operating handle of the friction drive was removed, and in its place a connecting rod, lever and foot pedal are arranged as shown in the illustration, so that when the operator's foot is removed from the pedal a spring instantly brings the lever to the off position, thus stopping the spindle.



HOME-MADE COIL WINDING OUTFIT

To assist the operator to feed the wire, the reel is mounted on a stand made of 1-in. iron pipe. This is equipped with a tension device consisting of a piece of band wire fastened to the back cross pipe of the stand and passing along a groove in the circumference of the end of the reel. Two weights are attached to the wire as shown. The large weight is fastened to a lever so that the pressure of the operator's foot releases the tension in the band wire which in turn releases the tension on the wire which is being unreeled. The smaller weight, which is 4 lb., is used to keep the band wire from coming out of the groove in the edge of the reel when the large weight is raised. The feature of this tension device is the fact that friction is applied to the circumference of the reel and not to the cotton-covered wire itself, and thus injury to the insulation is avoided. At the same time the tension is easily controlled by a movement of the foot.

Short pieces of cotton sleeving are used for additional insulation on the free ends of the coil. It is necessary to slip these sleeves over the wire before winding the coil as they have to be glued under the fish paper which holds the coil in shape after being taken off the form. One of these sleeves is used when the coil is started while the other is slid along the wire to the other end. Considerable time was consumed in threading the ends of the wire into the sleeves as the insulation backed away from the ends and became jammed in the sleeving. This is remedied by dipping the end of the wire in melted paraffin and pulling the insulation past the end of the conductor and twisting it. This made it easy to slip on the cotton sleeves.

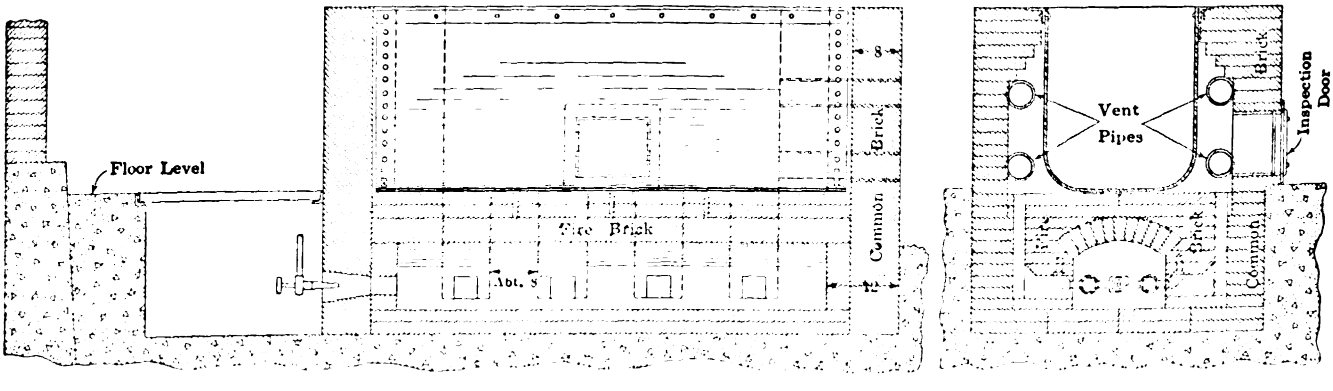
This coil-winding machine with the simple reeling device and the use of paraffin in putting on the cotton sleeves has cut the expense of winding coils in our shops in half.

Galvanizing Plant as Railway Shop Auxiliary

BY D. C. HINSTORFF
The Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

A small room in the shops of The Milwaukee Electric Railway & Light Company has been equipped with apparatus for doing miscellaneous galvanizing work. It has been used principally for galvanizing cross-arm braces, V-braces and other overhead fittings by means of the hot galvanizing process. This is a new venture for the Milwaukee company, but has been found, in the few months since it was started, to introduce a significant saving in the cost of these iron and steel galvanized fittings.

The apparatus required for this work and installed in this room includes a wooden sulphuric acid tank, a muriatic acid tank and a hot water tank. There is also an open tank, 6 ft. long, 2 ft. wide and 3 ft. deep, constructed of ½-in. boiler plate and mounted on a brick furnace setting in which the galvanizing alloy is melted. The oil furnace used is located in a pit 2 ft. deep, 2 ft. wide and 8 ft. long beneath this zinc tank. It is lined with firebrick. The oil is atomized by compressed air from the high-pressure shop main and will maintain the galvanizing alloy in a molten state at a temperature of about 950 deg. Fahr. The tank holds about 7000 lb. of zinc.



OIL BLAST FURNACE AND GALVANIZING TANK USED IN HOT DIP PROCESS

The material to be galvanized is first submerged in the sulphuric acid tank which contains a solution of five parts of water to one part of commercial sulphuric acid. This solution is heated by means of steam coils and is maintained at a temperature of about 140 deg. Fahr. Dipping the iron into this solution removes all rust and dirt, cleaning the metal ready to receive the zinc coating. The material is next dipped into boiling water to stop the action of the acid and then into the muriatic acid tank which contains a solution of three parts of water and one part of muriatic acid. This serves as a flux, causing the zinc to adhere to the metal. From this tank the material is put into the zinc tank while still wet, in order not to lose the effect of the muriatic acid as a flux.

The submerging of anything wet or cold in a hot zinc bath will cause an explosion, and in order to overcome this condition a small sheet-iron box having the bottom slightly submerged in the hot zinc and filled with crude salammoniac is placed in a corner of the zinc tank. Subjected to the intense heat over the liquid zinc the salammoniac forms a semi-liquid. The work is put down through this mixture into the zinc and is pulled out through the clear zinc. The fused salammoniac serves to prevent explosions and to preheat the iron pieces. From the zinc tank the galvanized material goes to a rack, where it is hung on hooks to drip. The zinc solution is mixed with aluminum and other alloys known as "silver metal" which thins the zinc so that it will drip off and leave a thin coat on the work.

Getting Rid of Dead Stock in the Storeroom

The Author Explains How 12 Per Cent of Store Stock on Northern Electric Railway Was Found to Be Obsolete

BY W. H. EVANS
Electrical Engineer Northern Electric Railway, Sacramento, Cal.

Recently in going over the inventory of materials and supplies on hand at the end of the fiscal year on this property, and comparing it with the list of the year previous, we discovered that we had a large amount of material in which there had been no movement during the entire year. There were also numerous other items in which the movement was small compared with the stock on hand. These facts indicated the presence of a large amount of obsolete material, for which we evidently had no further use, and a surplus of standard supplies compared with the ordinary yearly requirements.

Conference with the several departments concerned in the use of this material disclosed the fact that this obsolete and surplus stock amounted to about 12 per cent in value of the total stored stock. In other words, 12 per cent of the material was occupying space on the shelves, and represented just that much investment tied up and earning no return.

In what I term obsolete material not only that which has been superseded in the yard by improved material is included, but also supplies which might be usable by other companies but which under local conditions and requirements will no longer be needed. For example, we found such items as journal brasses for small-capacity flat cars now destroyed and written off our books; signal material ordered years before for contemplated installations afterward found unnecessary; bonds and bonding material far exceeding the requirements for years to come, apparently purchased for new lines that were never built; interurban car castings and parts evidently purchased with a view to building a large number of cars not actually built; third-rail underground crossing material which had been rendered obsolete by changes in the type of construction, and trolley pipe arm brackets in large numbers removed from branches having originally overhead construction but later changed to third-rail.

Each item on the obsolete list was examined to see if it could not still be used by the company; if not by the department originally ordering it, then in some changed form or condition by some other department. There proved to be a number of instances where material could be used by slight changes in design, thus utilizing stock which otherwise would have been discarded for sale as second-hand or scrap material. Where no further use could be found for material on the local property, it was listed as obsolete for possible sale to other users, or as a last resort it was rated as scrap and sold as such.

Surplus stocks of standard material were also listed for sale, after consultation with the several departments interested as to their annual requirements. In some cases we retained more than our estimated annual needs, having in mind the rapid fluctuations in cost of material. Evidently nothing would be gained by selling surplus material this year and having to pay greatly increased prices for the same material next year.

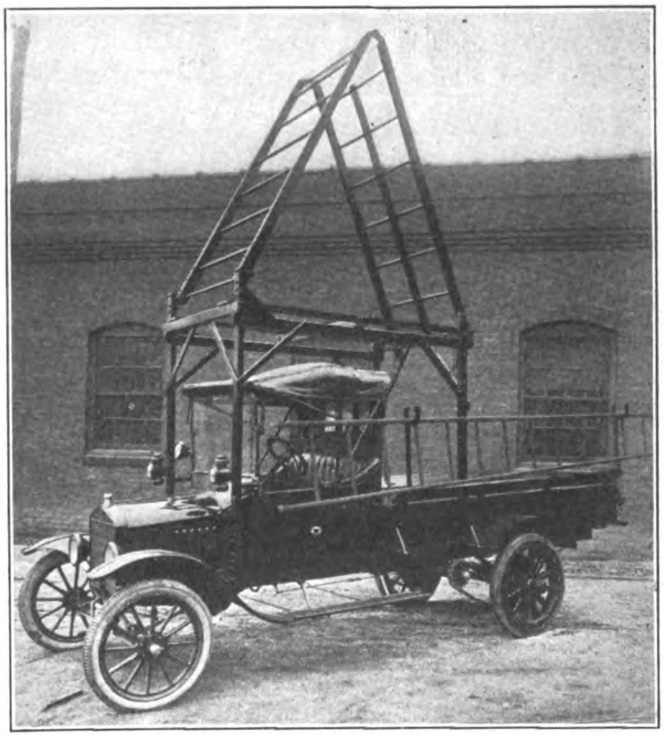
After we had completed the obsolete and surplus material lists, these were mimeographed and sent out to a number of companies in the West, in some cases to the purchasing agents and in others direct to the engineers, master mechanics, electricians and others directly interested. The stock lists were divided into a number of sections such as overhead trolley supplies, electric car equipment supplies, signal material, miscellaneous pipe fittings, bolts, washers, etc., so that only the items which would be likely to interest certain officials would be sent to them. These men were thus saved the necessity for having to go through long lists of items in which they were not interested.

The results which we are obtaining from the distribution of the material lists are very gratifying, as we have already disposed of a considerable amount of the material. We have hopes finally of getting rid of most of it second-hand, and the remainder will then be sold as scrap in the case of the obsolete material, while the surplus of standard material will be retained for future use.

It is probable that many companies could do something in the line of house-cleaning work like this. There is a tendency for men to "hang on" to material year after year, hoping or expecting some day to find a use for it. This is creditable, in a way, but the policy can be carried too far. While good judgment on the part of the men who originally order material and competent storekeeping may keep down obsolete and surplus stock, there is still a tendency for this to accumulate. It certainly pays to remove all this dead material from the storeroom shelves and to convert it into cash. It should be remembered that in selling dead material the money realized therefrom is practically all available as net, there being no operating ratio to be applied to the receipts. In other words, the department that "digs up" $5,000 worth of saleable and non-usable material has actually done as much as if the traffic department had provided twice this amount of new business, assuming an operating ratio of 50 per cent.

Handy Emergency Truck for Small Properties

The Paducah (Ky.) Traction Company has equipped a Smith Form-a-Truck of 2-ton capacity with a special body and tower arrangement for handling its emergency overhead work. The tower members are 2-in. x 3½-in. hickory pieces and the ladder-tower can be raised to a maximum height of 15 ft. The A-ladder folds together to lie flat on the platform above the Ford top. The piece through the center of the back ladder was put in to prevent a lineman from losing his balance in case his foot started to slide across the rung.



PADUCAH TRACTION COMPANY EMERGENCY TRUCK

The construction of the tower over the automobile top leaves the box on the rear of the truck free for other purposes. The light construction also makes it possible to use the truck for many different purposes. Thus, while the tower construction was built by J. E. Lawless, master mechanic Paducah Traction Company, the truck is used and maintained by the Paducah Light & Power Company, and all trolley maintenance work is handled by the latter company. This relieves the Paducah Traction Company of the upkeep on the truck, and the arrangement has proved to serve both companies satisfactorily.

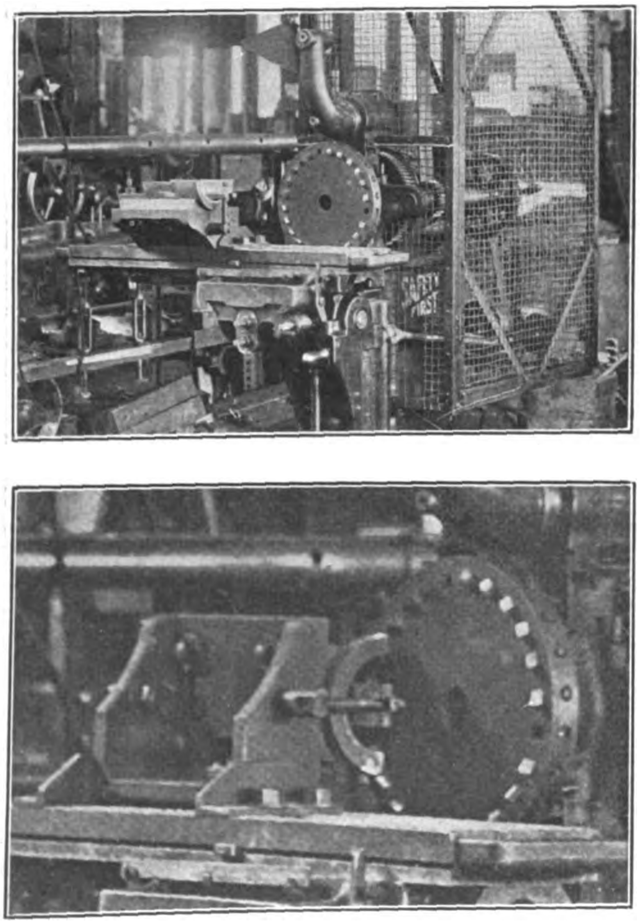
Report on Stresses in Railroad Track

A very important viewpoint in the computation of stresses in rail was expressed in the presentation of the report at the recent convention of the special committee of the American Railway Engineering Association on stresses in railroad track. The report emphasized the need to consider the rail as a bridge between drivers rather than as a bridge between ties, in figuring the internal stresses. From such a viewpoint the number of ties between driver centers is of little consequence, as long as it is more than two or three. In other words, the bending moment in the rail will be practically the same whether there are three or four ties, or five, under this section of rail between drivers, since the rail is bent concave downward between drivers, thus bringing the principal bearing on the two outside ties of the span between drivers, regardless of the number of ties under the span.

Machine for Facing Bearings Rapidly

For facing bearings quickly and accurately the International Railway, Buffalo, N. Y., employs a milling machine in combination with a special cutting tool and a jig for holding the bearings. This machine can face an axle bearing in three minutes, taking a 1/16-in. cut.

In the cutting tool there are twenty-four cutters mounted in a holder, 14 in. in diameter. The tools are made of Boehler's high-speed steel and are ground to a V-point at the cutting edge. They are held in place by set-screws. The cutting speed found best for the operation is 150 ft. per minute.



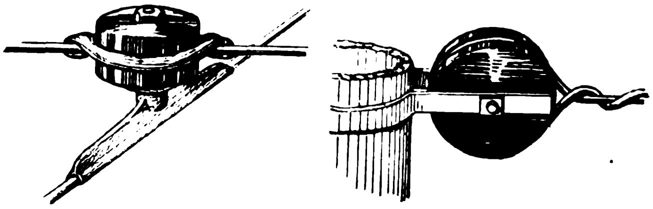
VIEW OF MACHINE FOR RAPID FACING OF BEARINGS, AND CLOSER VIEW OF CUTTER AND JIG

The jig is made with a heavy back-plate which is bolted to the sliding bed of the machine. To the back-plate is bolted a concave-faced block which fits the outside of the bearing. There are several of these blocks having faces of different curvatures to fit the different bearings. The bearing is clamped against the face of the block by a steel bar placed inside and bolted at its ends to the back-plate.

Incidentally it will be noted that the gears and other dangerous parts of the machine are surrounded by a wire cage, a commendable feature from the safety-first standpoint.

Combination Trolley Hanger and Strain Insulator

A simple device for supporting both span and trolley wires has been patented and is being put on the market by B. C. Moss of Kansas City, Mo. It consists of a cylindrical porcelain body, a wrought-iron clip and a bolt with nut and lock washer. When it is used as a hanger the clip fits in a groove around the porcelain body to hold the span wire, and a bolt, passing through the axis of the insulator, is screwed into the ear of the contact wire. By simply removing this bolt the ear can be changed while the span wire is left undisturbed. When used as a strain insulator at a pole, the span wire fits in the groove in place of the clip, and the bolt clamps the two ends of the pole collar which fit in slots provided in the ends of the insulator.

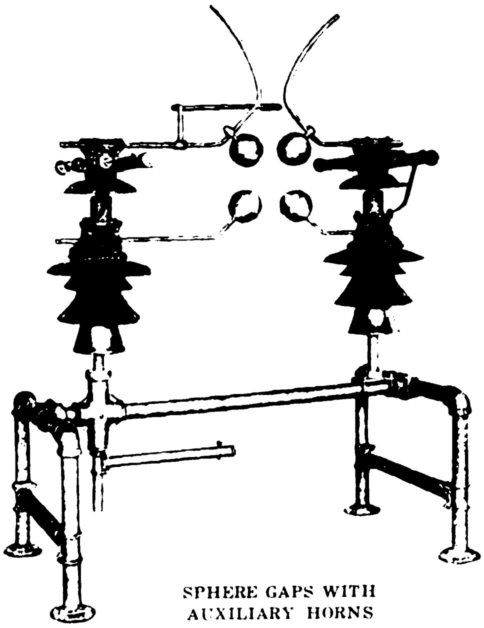


HANGER IN USE AS TROLLEY SUPPORT AND AS STRAIN INSULATOR FOR SPAN WIRE

Hangers of this type are now installed on several Western lines. During the two years they have been in use on the Kansas City Railways it is said that no failures have been reported, although they have been subjected to very severe tests.

Sphere Gaps Provide Additional Protection for High-Voltage Lightning Arresters

The use of sphere gaps is one of the latest developments in the design of aluminum electrolytic lightning arresters for voltages above 7250. For lower voltages the diameter of the copper rod used to make the horn gap is so large in proportion to the gap that the effect is the same. The illustration shows a sphere gap designed by the General Electric Company, Schenectady, N. Y., for 70,000-volt lightning arresters. The upper



SPHERE GAPS WITH AUXILIARY HORNS

spheres have a horn to assist the arc to rise and be extinguished quickly. A horn is unnecessary on the lower spheres as the arc quickly rises to the upper ones and is extinguished.

Instances are not uncommon in which a voltage in the form of a sudden impulse has broken down what was apparently not the easiest path. For example, the voltage may rise beyond the 60-cycle discharge voltage of the protective gaps and arc-over a machine or puncture insulation which has withstood a much higher test voltage than that for which the spark gaps were set. To avoid such occurrences it is essential to have the spark gaps as quick acting as possible. It is claimed the sphere gap is faster than the horn gap, and that it therefore furnishes more complete protection.

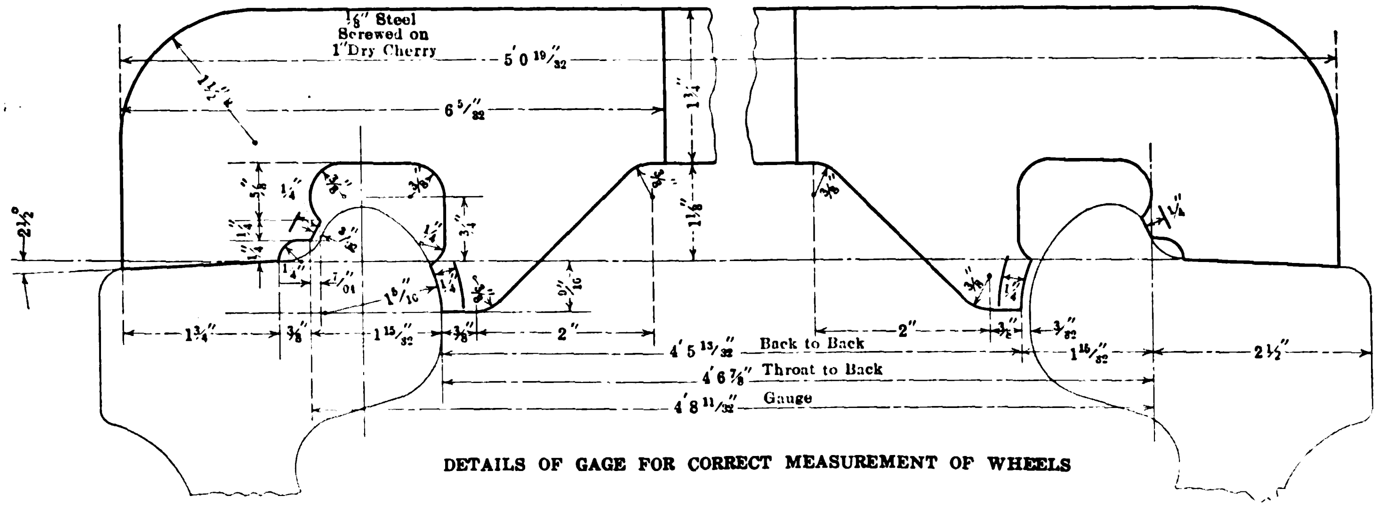
Wheel Contours and Proper Gaging

Engineer Discusses Proper Heights of Flange and Pitch of Tread, and Describes a Correct Way to Gage Wheels

The accompanying drawings show two gages for checking up car wheels. They were submitted by the engineer of a large company manufacturing car wheels, who calls attention to some important matters in connection with gaging of wheels, the height of the flange and the pitch of the tread. He says:

"The gaging of the wheels is very important. The only proper way is to gage from the throat side of one flange to the back of the mate flange. Where the throat side of the flange is against the head of the outside rail of a curve or a frog, the back of the mate wheel should touch the guard rail. If wheels are so gaged a much better flange can be worked out than by gaging from the throat of one wheel to the throat of the mate.

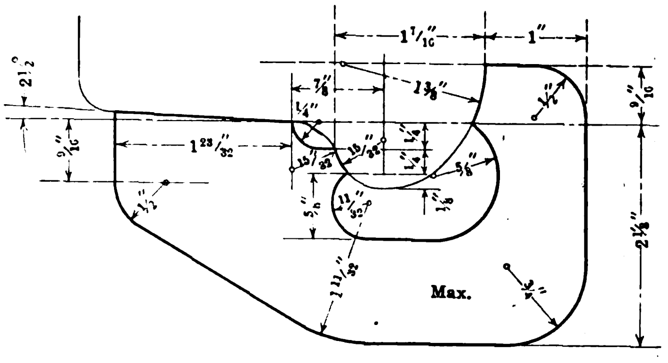
"Track engineers are considering a flange ¾ in. in height for city cars. I should think that they would be in favor of a ⅝-in. flange on account of the old tram rail still in service. If they use a ¾-in. flange they will cut the tram off the rail by reason of the wheels riding on the flanges instead of the tread. If they use a ⅝-in. flange they will get several years more wear out of these old tracks. A long flange is not necessary to hold the car on the track, since the fillet of the flange is all that guides the truck, and if the wheel runs over an obstruction it is usually off the track regardless of flange height. If it mounts the rail past the fillet the reverse curve at the point of the flange will not hold it on the track. About all this reverse curve is good for is to clear a switch point when the switch is not fully thrown.



DETAILS OF GAGE FOR CORRECT MEASUREMENT OF WHEELS

"The pointed flange is not designed for flange-bearing frogs. It does not take long for the flanges to cut out the risers. If flange-bearing frogs are to be used, or if the wheel is to be operated with the load bearing on the point of the flange instead of on the tread, the flange should be designed to carry this load.

"The pitch of the tread of a street car wheel is of minor importance, as there is very little lateral play in street car wheels, if the track is reasonably near to the gage. When a wheel wears to a sharp flange it is not because of side play, but because the wheel crowds the rail all the time, entirely eliminating side play. Wheels usually wear to a concaved surface and the tops of the rails to a convex surface in both steam and electric railways.



MAXIMUM FLANGE GAGE

"The tread being only slightly wider than the head of the rail, there is no chance to form a false flange on the outside of the rim, while in steam road wheels, with the wide tread, this is largely the cause of removal of wheels. Too much taper would be very objectionable. If the wheel were designed with a cylindrical tread and the rail with a flat top, both would soon become curved by wear from what side play there is. I can see no serious objection to the proposed pitch of 1 in 25 for street car wheels, with treads not over 3 in. in width."

The Portland Railway, Light & Power Company, Portland, Ore., recently reported the number of passengers crossing the interstate bridge across the Columbia River, between Portland, Ore., and Vancouver, Wash., on its cars during the first six days of the operation at 16,901, or an average of 2817 daily. Moving pictures were taken of the ceremonies which attended the opening of the bridge and were shown in the theaters throughout the United States by one of the moving picture news services.

London Letter

London Tram Sections to Be Merged—Glasgow System Free from Debt — London Omnibus Conditions Trying

(From Our Regular Correspondent)

A scheme for the reorganization of the London tramway system has been adopted by the London County Council. It is proposed that the existing ten sections shall be merged into five departments—traffic, electrical, rolling stock, permanent way, and general—and that there shall be devolution by the chief officer of duties and responsibilities to higher subordinate officers. It is recommended that, among other officials, under A. L. C. Fell, the chief officer, a traffic manager shall be appointed at a salary of £1,200, an electrical engineer at the same salary, and a rolling stock engineer at £1,000. For the first-mentioned post, the selection of J. K. Bruce, the deputy chief officer, is suggested. It is proposed that the traffic branch shall include a publicity section, the highways committee being of the opinion that more newspaper advertising and publicity work generally would be advantageous.

At a recent meeting of the tramway committee of the Glasgow Corporation, the Convener stated that the system was now free from debt, all the capital expenditure of £3,835,156 having been repaid. The total of the sinking fund applied in the reduction of debt has been £1,506,267, and the amount of the department's investments not only equals the balance, but there is a balance of £119,055 at the credit of the depreciation and permanent way renewals fund. It is recommended that £73,522 be set apart in future each year from revenue to meet expenditure in renewals. In a memorandum, Mr. Dalrymple, the general manager, gave the following particulars of this sum to be set aside for renewals: Permanent way, £39,600 (£200 per mile of single track); power station and substations plant, £13,827 (3 per cent); cars and electrical equipment of cars, £16,755 (3 per cent); other rolling stock, £2,790 (15 per cent); and Clydebank bridges, £550 (5 per cent), a total of £73,522. The amount proposed to be set aside for the renewal of permanent way was practically the average sum which had been spent annually during the last ten years. In the case of the electrical equipment of the line, it was quite possible to keep up the equipment from year to year directly out of revenue. The management had hitherto set aside 2½ per cent on the cost of the buildings and fittings. As it was unlikely that any of the buildings would require to be renewed for many years to come, it was not proposed to set aside any additional sum for depreciation. The tramway was taken over by the corporation in 1894. It was then operated by horses. That system was superseded in 1901 by electric traction. Thus all the capital expenditure which that change involved, as well as the cost of the developments which have taken place in the intervening period, has been wiped out within sixteen years.

In Birmingham the public works committee of the Corporation has been considering an important scheme for linking up the tramways in the center of the city in conjunction with street widenings and improvements. The provision of a subway has been suggested, and A. Baker, the manager of the tramways, has been requested to prepare a definite scheme. A difficulty is the existence of the London & North Western Railway at a considerable depth below the surface in the center of the city. Trail cars are to be tried on one route as an experiment.

Mr. Spencer, the general manager of the Bradford tramways, has been invited to take up important government work, and the corporation has decided that in his absence Mr. Stirk, the traffic superintendent, be appointed to take charge of and be held responsible for the proper working of the traffic side of the department. J. W. Dawson, engineering assistant, will be similarly appointed as regards the engineering side.

Owing to the reduced returns accruing from its holding of the London General Omnibus and Associated Equipment companies' capital, the total income of the Underground Electric Railways from its investments was £27,400 less in 1916 than in the previous year. This fact and an increase of £56,800 in respect of loss of exchange and income tax were the chief reasons why the payment on the 6 per cent income bonds had to be reduced from 6 to 5 per cent and the carry-forward from £38,600 to £30,600. A saving of £13,500 under the Central London guarantee was a compensating factor.

The Mayor of Brighton announced to a meeting of the Brighton, Hove & Worthing Season Ticketholders' Association that, after the war, the London, Brighton & South Coast Railway had decided to install four tracks from Brighton to London, two to be used for express service. It is also intended to electrify the line.

The tramways committee of the Dundee Town Council has been considering the question of the utilization of the tramways for the transport of jute. Mr. Fisher, the general manager, stated that he had given considerable attention to the matter, and at the meeting of the Municipal Tramways Association he dwelt upon the importance of tramway people directing their attention not only to carrying passengers, but to the transportation of goods. He expressed the hope that when the national interests were at stake there would be no difficulty in the matter. In December he received a letter from the munitions transport officer asking, among other things, if he could use the tramways in Dundee to convey munitions. Mr. Fisher replied that the government could use the lines for the whole period between 12 o'clock midnight and about 5 a. m., exclusively for the purpose, and, possibly, to a lesser extent in other hours.

Owners of tramway undertakings in England are experiencing great difficulty in getting materials for maintenance and renewals. A letter has been sent from the Ministry of Munitions to the tramway associations stating that numerous applications are being received from tramway undertakings for priority certificates for the manufacture of tramcars and of materials required for tramway maintenance. The Ministry considers that before issuing certificates every effort should be made to supply the applicants with materials and vehicles which other tramway undertakings may have at their disposal. The associations are accordingly requested to obtain from their constituent undertakings details of materials and vehicles which they can dispose of. The proposal virtually amounts to a pooling of resources in regard to the articles in question, though no doubt due payments will be made.

At the annual meeting of the London General Omnibus Company the chairman stated that the conditions under which the company was operating were by no means easy, and that a further reduction of profit was probable before the return of normal conditions. The cost of all supplies required for the operation and maintenance of the fleet of omnibuses had increased beyond bounds considered possible two years ago, and many of the supplies were practically impossible to obtain at any price. The supply of petrol was being restricted, so that further reductions of services had been necessary. The problem of securing adequate labor was also great. With the continued call of men to the colors it had been found necessary to engage women in increasing numbers. More than 2000 women were now engaged as conducters, while some of the women had been promoted with satisfactory results to positions as training instructresses, timekeepers, depot cashiers, etc. On the engineering side, too, the services of women were being utilized. Nearly 550 women were doing satisfactory work in the garages as washers and cleaners of omnibuses.

Every endeavor is being made to commence through service of trains on the Bakerloo Railway between the Elephant & Castle and Watford on April 1. Although no official statement has been made, it is understood that there has been difficulty in procuring rolling stock necessary for a fifteen-minute service. This has now been overcome by the Central London and the Piccadilly tube companies lending available cars. As soon as the new electric service is inaugurated, the London & North-Western local steam trains, which have already been withdrawn as between Euston and Willesden, owing to the closing of the stations en route, except Queen's Park (Bakerloo) and Kensal Green, will also be withdrawn between Willesden Junction and Watford, only the Broad Street (City) expresses and other main line services making the non-stop run between Willesden and Watford. Stonebridge Park station, which was recently destroyed by fire, is not likely to be rebuilt until after the war. Otherwise all the stations on the new line have been constructed. A. C. S.

News of Electric Railways

Traffic and Transportation

Financial and Corporate **Personal Mention** **Construction News**

War Protective Measures

Statement of What Has Been Done in Ten Cities from Coast to Coast to Protect Railway and Lighting Plants

The first concern of the electric railways subsequent to the war message of President Wilson has been to insure uninterrupted service to the communities which they serve. A canvass of some of the principal electric railways and combined railway and lighting properties by members of the staff of the ELECTRIC RAILWAY JOURNAL and by its correspondents in the principal cities shows that the extent of the precautionary measures taken by the companies to guard their properties has depended very largely on the degree of their vulnerability to injury by the enemy or their agents.

SHARP-SHOOTERS AND BARBED WIRE

In one city national guard sharp-shooters have been stationed at the electric generating and distributing stations, and 6-ft. barbed wire entanglements have been constructed around the powerhouses. All carhouses of this company and of an interurban line running out of the city are under special police protection, but no application has been made by the street railway officials for authority for military protection. Along the local and interurban lines, the high-power transmission systems are being guarded by deputy sheriffs in the localities through which the transmission lines pass.

Somewhat similar measures to those have been adopted by a company on the Pacific Coast. This company for the last month has had thirty-six employees formerly in the army or the national guard clothed with deputy sheriff authority to guard the hydroelectric plant and important substations day and night. These guards were supplanted on April 4 by federal soldiers. Some time ago elaborate flood-lighting systems were installed at all the hydroelectric plants to protect the pen stocks and the plants themselves. No unusual precautions have been taken to guard the transmission lines, the track, bridges or carhouses, aside from the regular employees whose duties cover the company's property.

ONE HUNDRED ARMED MEN ON GUARD

In a city of the Middle West 100 armed men of a company of the state national guard under War Department orders patrol the river fronts day and night, guarding the central and other power stations of the railway. Men of this detachment also guard the bridges, track and transmission lines. Extra militiamen have been placed on the bridges used by one of the interurban lines entering the city. When the militia is called upon to leave, guards will probably be employed under department orders. The powerhouses are kept lighted. No other protective measures have been taken by the companies except the use of the usual section gangs and watchmen. The company of the militia which is doing this patrol duty is composed almost wholly of employees of the local city railway.

SPECIAL OFFICERS IN USE

In one city in the Southwest armed guards with commissions of special officers are being used to protect the power stations of the city railway by day and by night. The plants of one of the interurban railways there and the plant of the local light and power company are also being guarded. Tracks are not being patroled except by track gangs, but these men have instructions to exercise extra precaution. Still another company operating in the city is also guarding its power plant by day and by night, but the tracks are not patroled except by regular track workers.

The interurban railways in one of the lake cities have strengthened the service of their watchmen and put guards on some of the bridges. The power houses of these companies are operated in the usual way and are not flood-lighted. The staff of watchmen at the power houses of the city railway there has been strengthened, but no legal guards or others have as yet been employed. Care is being exercised in the issuance of passes to inspect the power plants. The power station of the local electric light company, however, is flood-lighted.

In another city in the same geographical group of States as one of the other companies mentioned the city railway has adopted no extra precautions with respect to the bulk of its property. The transmission lines coming from another State are being protected by militia day and night, but the tracks are not being patroled. The carhouses of this company are protected even in normal times, and no extra guards have been employed and no arms or legal authority have been vested in the employees.

At an important interurban center in the Middle West it had not been deemed necessary up to the time of writing to adopt any precautionary measures other than those used regularly to safeguard the properties and protect them against any interruptions to service.

COMPANIES ADDRESS THE CITY

Some time ago the railway corporations in a Southwestern city addressed a communication to the City Council outlining the arrangements made by them to share in the national defense plans. They announced then that the transportation facilities of both railways would be placed at the disposal of Government agents and further said that all employees had been instructed in the part which they would be required to perform if the Government called upon them for service.

At New York City two notices, approved by T. P. Shonts, president, were issued a few days ago by Frank Hedley, vice-president and general manager of the Interborough Rapid Transit Company, bearing upon the present national crisis. They are of the same tenor and urge caution against possible plots to upset transit. One of the notices said:

"The gravity of the national crisis is such as to require that every employee, whether on the elevated structure, in the subway, the shops, the power houses, or the offices, should maintain a constant vigilance in the discharge of his duties, to detect irregularities of any kind whatsoever, and promptly report the facts in person or by telephone to the head of his department."

WHOLE SYSTEM TO BE PROTECTED

Another system in the East is now organizing a force of guards and installing protective equipment to cover the whole system. In general, guards are to be placed at strategic points such as the portals of tunnels and at power houses. Full police powers have been requested for them and if these are granted the guards will be classed as special policemen entitled to carry arms and to make arrests. Exterior lighting at night will be provided for power stations and guards will be stationed at points where the lighting is ineffective. Substations will be guarded by the attendants. For the carhouses, the fire system watchmen normally employed together with the regular exterior police protection are deemed sufficient. No special patroling of track or transmission lines, aside from that regularly employed, is to be inaugurated, except that, as beforementioned, guards will be stationed at such places as are considered danger points.

Market Street Rights Offer

President Lilienthal of the United Railroads, San Francisco, Suggests Joint Use of Market Street Tracks and a Joint Transfer Plan

City officials in San Francisco, Cal., have recently been active in planning for the construction of municipal railway tracks on outer Market Street, paralleling those of the United Railroads. At the same time negotiations were being carried on with the United Railroads looking to the joint use of outer Market Street tracks owned by the company. If the city could arrange for joint use of these tracks, considerable outlay in construction work could be saved.

MR. LILIENTHAL'S LETTER

Under date of March 29, Jesse W. Lilienthal, president of the United Railroads, has addressed a proposal to the Mayor and the Supervisors which reads as follows:

"I had occasion in a recent communication to say to you that, notwithstanding the official position which I occupy with the United Railroads, you knew that I was always ready to place the public welfare above private interests, and in that spirit I take the liberty to urge upon you not to carry out the proposed plan for the paralleling of the tracks on Market Street.

SOME CARS TO FERRY

"The company is willing that the city should operate its Church Street line from Sixteenth Street on Church Street and on Market Street from Church Street to Van Ness Avenue on the tracks of the United Railroads on a mileage basis. The company is further willing that a limited number of Church Street cars be operated over the tracks of the United Railroads to the ferry, upon a similar mileage basis; and to make a transfer agreement on a 50-50 basis, providing for exchange between the Church Street line and our Market Street lines. With this disposition on the part of the company, I permit myself to say that there does not appear to be any warrant for the proposed expenditure of city moneys, because the desired transportation facilities would be provided for without further expenditure.

URGES NEW CITY LINES

"In view of the crying need of many districts in the city for transportation facilities, which the company under existing charter conditions is not able to provide, it would seem that any city moneys that may be available should be applied to providing such transportation facilities rather than to duplicating existing ones, with the attendant economic waste.

"I am making a proposal, at great financial sacrifice to the company, which should in my opinion be acceptable to you in the interest of all the people, but if any modification of same is desired by you I shall be glad to receive your further suggestions."

In commenting on Mr. Lilienthal's proposal, Mr. O'Shaughnessy took a favorable view of the prospect for adjusting the differences between the city and the company in the near future. He said:

"This at last appears to be a step in the right direction for settling the difficulty, and I think through the offer something definite can be accomplished."

Washington Strike Waning

Efforts on the part of the Washington Railway & Electric Company, Washington, D. C., in connection with the strike of its employees have been devoted during the last week largely to the work of perfecting its car personnel and to running down the men who were involved in the wrecking of a car of the company, referred to in the ELECTRIC RAILWAY JOURNAL of March 31. In connection with the first of these problems a great deal of progress has been made, while in the second the police have made a number of arrests of suspects. So far as its service is concerned, the company regards the strike as a closed incident. The men formerly in the employ of the company are now seeking to enlist the help of the American Federation of Labor in their cause.

Violation of Agreement Charged

Employees of the United Traction Company, Albany, N. Y., voted almost unanimously at recent meetings not to operate tripper cars during the rush hour at night unless the company paid them time and one-half for making the extra runs. They contend that they are justified by their working agreement with the company in making such demands. The decision became effective on March 31. The meeting of the men was thrown open to the public, and it was announced that every act of the union with respect to its agreements with the company would receive the fullest publicity.

The statement issued after the meeting was to the effect that the United Traction Company entered into an agreement with the men on July 1, 1916, for three years, under the terms of which it was to pay the men time and one-half if they should be called upon to do any extra work after their regular day's work, the time and a half to begin from the time the men finished their day's work and to continue until they completed the extra work. The representatives of the men contended that the company refused to carry out that portion of the agreement and objected to letting regular men off, although extra men working part time wanted the opportunity to work a full day.

Changes in Public Service Personnel

New Directors and Officers Elected for Public Service Corporation of New Jersey

A number of changes in the organization of the Public Service Corporation of New Jersey and its subsidiary companies were approved by the boards of directors of the companies on April 2. George J. Roberts, first vice-president of the several companies, retired because of the condition of his health. Mr. Roberts, who had been vice-president for nearly ten years, underwent a serious operation last November and he has never fully recovered his strength. His withdrawal from the company's activities was of his own volition.

The retirement of Mr. Roberts and of P. Farmer Wanser, who is also in poor health, as directors, together with the deaths of John J. Burleigh, Edgar B. Ward and Ferdinand W. Roebling, left five vacancies on the board of directors. Instead of filling all five places the membership of the board was reduced from twenty-one to eighteen, and Percy S. Young and former Senator Edmund W. Wakelee were elected directors and also appointed members of the executive committee of the corporation and the operating companies.

The annual meetings of the stockholders of the several companies were held in the morning. The directors' meetings were held in the afternoon to perfect their organizations. Thomas N. McCarter was re-elected president of all the companies. The numerical designation of the vice-presidents of the corporation was eliminated and Randal Morgan and Anthony R. Kuser, together with Messrs. Young and Wakelee were elected to those positions. The complete list of changes effected, not including the officials re-elected or reappointed, follows:

George J. Roberts, retired from the position of first vice-president and as a director. Gen. Edwin W. Hine received leave of absence for one year. Edmund W. Wakelee and Percy S. Young were elected vice-presidents and directors. Dudley Farrand and John L. O'Toole were appointed assistants to the president. T. Wilson van Middlesworth was elected to succeed Percy S. Young as treasurer. William S. Barker, former assistant treasurer, was appointed comptroller, which office was revived. F. A. Neis was elected assistant treasurer. William H. Feller was elected assistant secretary to succeed Harry C. Stevenson, who was appointed assistant to the vice-president in charge of public relations. Farley Osgood was elected vice-president and general manager of the Public Service Electric Company to succeed Dudley Farrand. Messrs. Young and Wakelee were elected vice-presidents of the railway as well as of the Public Service Corporation and the other subsidiary companies of the corporation. Martin Schreiber, who has been engineer of maintenance of way for the Public Service Railway, received the title of chief engineer.

Dallas Franchises Approved

Grants Under Which Properties Will Pass to Local Interests Approved at the Polls

The electric railway and lighting franchises sought by J. F. Strickland and C. W. Hobson, and submitted to a vote of the people of Dallas, Tex., were approved at the election on Tuesday, April 3, by a vote of two to one, or by a majority of about 3600. Despite the vote on the franchise in their favor, Messrs. Strickland and Hobson will not begin reorganizing the systems until the contest of the city election on the charter amendment of last April is decided. The old charter prohibited the granting of new franchises until the old franchises expired. The charter amendment was designed to repeal this provision. Mr. Strickland said:

"The franchises adopted in Tuesday's election are absolutely dependent on the charter amendment adopted last spring. The question of the validity of this election is now in the courts, and if the case is decided adversely, the franchises will be void. We will await the court's decision. If the decision is in our favor the consolidation plans will be carried out immediately."

The old city charter prohibited the granting of franchises unless they contianed a 4 per cent gross production tax. That measure also prohibited the indeterminate franchise. These two provisions were repealed in the city charter election which is now being contested in the courts.

Mr. Hobson, in his comment on the election, was quoted in part as follows:

"We will do nothing toward carrying out our agreement in reorganizing the traction lines, including the taking over of the Oak Cliff lines, until the contest on the charter election is decided in our favor."

A period of ninety days is provided in the new franchises from the time of the election in which the traction and lighting consolidations shall be carried out. A decision in the contest over the city charter election is expected before that time expires.

The new Dallas franchises were passed in connection with the plan under which control of the present local railway and light properties there will pass from Eastern to Dallas interests under terms reviewed previously in the ELECTRIC RAILWAY JOURNAL.

Other Atlanta Convictions

Striker Sentenced to Serve Six Years for Perjury—Several Other Indictments Returned

William Pollard, professional agitator, who went to Atlanta, Ga., last summer as the accredited representative of the electrical workers' or linemen's union, was convicted in the Criminal Court of Fulton County on March 30 on the charge of having procured false testimony in the trial of L. E. Dodgen, convicted of dynamiting cars of the Georgia Railway & Power Company.

Pollard was sentenced by Judge Ben Hill to serve six years in the Georgia penitentiary. In sentencing him Judge Hill said the coming of this man to Atlanta was unfortunate for the city, for the company, for a number of employees who theretofore had been satisfied with their work and wages, and for Pollard himself. Judge Hill commented upon the reign of attempted lawlessness and violence which followed Pollard's efforts in behalf of the company's striking linemen and later in behalf of those of its trainmen whom he induced to abandon their cars and desert their posts, to dominate the company with the will of the linemen's union on the one hand and the determination to organize a street and electric railway union on the other. Judge Hill said that while Pollard could not be held responsible for the numerous acts of violence that occurred, "it taxes credulity to assume that those men of their own initiative asserted their conditions through rioting and dynamiting." Judge Hill said further that all who heard the evidence of Pollard's trial were not surprised by the jury's verdict of guilty without recommendation of mercy. Pollard's lawyers gave notice of appeal for a new trial, and he was allowed to go on bond of $3,500. In convicting Pollard, the State established its charge that he headed a conspiracy of union labor devotees to prove by perjury a false alibi in behalf of Dodgen.

J. W. Foster, a lineman of a local telephone company, indicted on March 15, arrested on March 16, and placed on trial in Judge Hill's court on March 24 under a count charging that he committed perjury in the Dodgen trial, was convicted on March 22, and was sentenced on March 23 to serve four years in the Georgia penitentiary.

Several other indictments charging perjury in the Dodgen trial have been returned by the Fulton County Grand Jury and are yet to be tried.

The jury that convicted Pollard was drawn from the Fulton County Grand Jury panel and returned its verdict after forty-five minutes' deliberation.

Pollard is yet to be tried again under the indictment returned last fall, charging him with inciting to riot. The first presentation of this charge, last November, resulted in a mistrial.

P. S. C.'s War Policy

Thomas N. McCarter, president of the Public Service Corporation of New Jersey, has issued a statement in part as follows:

"The directors of the Public Service gas, electric and railway companies at their monthly meeting considered the effect a call to arms in defense of the nation would have upon the company by virtue of the probability of a large number of its 13,000 employees offering themselves for war service. Because of the activities of the New Jersey National Guard, the board voted a leave of absence for one year, with full pay, to Brig.-Gen. Edwin W. Hine, assistant to the president, so that he will be in readiness, on notice, to assume whatever obligations his position in the guard might bring to him in the development of the present crisis.

"Last summer when the National Guard was sent to the Mexican border about 100 Public Service men responded, and the operating companies by which they were employed carried these men on their payrolls during the period of their federal service and reserved their jobs for them during their absence. This action was taken because it was felt that the period of service would not be greatly extended, and because the corporation was in a position, financially, to bear the burden thus imposed, as a voluntary contribution to assist the Government in the work it had undertaken.

"Since last summer conditions have been materially changed. Not only have operating costs been greatly increased, due to higher prices for materials and labor, but the corporation's contribution to the expenses of the Government has been substantially enhanced through the operation of the federal corporation tax laws, so that the amount it now pays through this channel is largely in excess of the sum it expended last year for the wages of its soldier employees.

"Public Service will bear its share of whatever burdens war may bring. That a number of its employees will enlist for service with the colors is a foregone conclusion, and in case any of these men leave actual dependents behind them, the directors have voted that all such cases shall be referred to the corporation's welfare department, each to be treated fairly and generously as the circumstances may require, and no man who enlists will lose his position or standing in the company by which he is employed."

Labor Arbitration in Detroit

The questions of wages and working hours in dispute between the Detroit (Mich.) United Railway and its employees who are members of the Amalgamated Association will be submitted to arbitration on demand of the men. The company has appointed John A. Russell, vice-president of the Board of Commerce and president of the Manufacturer Publishing Company as its arbitrator. The men have selected Judge E. J. Jeffries of the Recorder's Court as their arbitrator. These two gentlemen under agreement are to select the third arbitrator. The strike meeting which had been arranged was called off when the company promptly agreed to submit matters to arbitration.

Pittsfield-Albany Line Planned

Proposed Road Would Provide Connecting Link in Line Between Boston and Buffalo

Plans are under way in Massachusetts for the construction by the Schott-Gillett interests of Pittsfield of a connecting link between the Berkshire Street Railway and the United Traction Company, Albany, N. Y. At an organization dinner on March 28 it was announced that the franchises for the road have been secured in New York State and in Massachusetts with the exception of Pittsfield and Hancock. The distance from Pittsfield to Albany by the proposed route is 37.5 miles compared with 50 miles via the Boston & Albany Railroad. The running time is to be ninety minutes compared with eighty minutes via the Twentieth Century Limited train on the steam road. The schedule will call for ten passenger trains daily in each direction during the five winter months and sixteen trains daily each way in summer, with one winter freight train each way daily and two summer freights.

The line will cross only two highways in Massachusetts and will complete electric railway trackage from Boston, Mass., to Buffalo, N. Y. The estimated cost of construction is $1,650,000, and if capital is subscribed promptly work will be started by July 1. It is hoped to have the road in operation by July 1, 1918. Among those at the organization dinner were C. C. Chesney, general manager of the Pittsfield works of the General Electric Company, and Clinton Q. Richmond, general manager of the Berkshire Street Railway. Improved freight service between Pittsfield and New York City via the Hudson River is a feature of the plan, the promoters having negotiations under way for the use of dock facilities at Albany.

Rhode Island Affairs Before State

Bill for Complete Investigation of Problems of the Rhode Island Company in the Legislature

The affairs of the Rhode Island Company operating in Providence and other places in Rhode Island were laid before the General Assembly of Rhode Island on April 5 by the federal trustees in charge of the railway, in an appeal for legislative action to relieve the company of some of its financial burdens. The company asks the Legislature to direct the Public Utilities Commission to conduct an investigation of its finances and affairs. On the same day the Public Utilities Commission, in a special report to the Legislature, recommended just such an investigation, and at a public hearing on the matter that afternoon Chairman Bliss of the commission declared positively that the railway problem in the State would never be settled until such an investigation was made.

At the public hearing before the House judiciary committee, Rathbone Gardner, chairman of the federal trustees, Theodore Francis Green and John O. Ames asked for the passage of the investigation measure. This bill includes the following provisions:

"The public utilities commission is hereby directed to make an investigation of the finances, management, property and mode of operation of the Rhode Island Company, and to determine whether said company is furnishing to the people of this State a reasonably proper transportation service, and whether the net income of said company is a fair and equitable return upon the property owned and controlled by it and devoted to the public service.

"The Public Utilities Commission is authorized hereby, upon the completion of the investigation provided for in Sec. 1 hereof, to order any modification of the rates of fare charged by the Rhode Island Company, or of its transfer system, and such other modifications in its system of fares and transfers as said commission shall find to be just and equitable. Such modification shall be subject to change from time to time in the discretion of said commission, whenever in its opinion the public interest shall so demand and the affairs of the Rhode Island Company shall warrant.

"The Public Utilities Commission is hereby authorized to suspend or lessen any payments to be made by said the Rhode Island Company either to the State of Rhode Island or to any city or town, such suspension or variation to be for such term as said commission shall deem to be for the public interest, and any contract or agreement with the State of Rhode Island or with any city or town is hereby modified to the extent of any suspension or variation which shall be ordered by said commission under the provisions of this act."

Mr. Gardner in addressing the committee said in part:

"The company must be relieved or go under. We have borrowed every cent possible, and see nothing ahead without relief such as this bill gives. Either you must make it possible for this railroad to make a fair return on its investment, or you must run it yourself. The people must be served with transportation, and they will demand it one way or the other. We men are trustees only, and our sole interest is to run this road honorably and serve the people as well as we can. You must help us or there is but one thing in store.

"In the opinion of the directors of the Rhode Island Company there is involved in the present condition of street railway transportation something more fundamental than the mere question of the transfer system. The revenue of the Rhode Island Company is now insufficient to meet its reasonable requirements. It has been difficult for it to meet the just demands of its workers for wages."

Carhouse and Cars Destroyed.—The Carbon Transit Company's carhouse, together with its contents, in Upper Mauch Chunk, Pa., was recently destroyed by fire of unknown origin. Five summer cars were burned.

Strike on Pennsylvania Line.—Because of the refusal of their demands for an increase in wages of 4 cents an hour, the motormen and conductors on the West Chester, Kennett & Wilmington Electric Railway, Kennett Square, Pa., went out on a strike, completely tying up the system. The men are now receiving 21 and 22 cents an hour.

Increase in Wages in Toledo.—Effective on April 1, the motormen and conductors of the Toledo Railways & Light Company, Toledo, Ohio, received an increase of 1 cent an hour in their wages. Employees of the electric light and power department received an advance of 25 cents a day. This is in accordance with the agreement entered into between the men and the company a year ago.

Grievances Adjusted at Conference.—As a result of a conference between officers of the Burlington County Transit Company, Hainesport, N. J., and a committee of the employees the men have agreed not to press the demand which they made some time ago for an increase in wages. The company has agreed to modify the system of fare collection now in use and to make other changes in the interest of the comfort of the men.

$8,800 Contributed to Professional Classes War Relief Council.—Up to April 1, 872 subscriptions, aggregating $8,833.75, had been received for the Professional Classes War Relief Council in Great Britain. This council was organized to assist the families of professional men that are in distress on account of the war. Contributions may be forwarded to Lewis B. Stillwell, treasurer, care Farmers' Loan & Trust Company, 475 Fifth Avenue, New York.

Public Utility Review.—The New York *Evening Post* published on March 30, 1917, its fourth annual public utilities review. It contained forty pages. Among the contributors well known in the electric railway field were Travis H. Whitney, William M. Wherry, Jr., C. H. Beck and Arthur Williams. A particularly timely article was the review of the negotiations for a traction settlement now under way in Chicago. The general subject "The Street Railway Transportation Problem" was contributed by C. H. Beck of the Westinghouse Air Brake Company, St. Louis, Mo.

Paving Question Settled.—A contract covering the street paving question at Toledo, Ohio, as prepared by Henry L. Doherty, was approved on March 29 by the street railway committee of the City Council. This covers only certain streets, and the company is to make the payments for the paving between the tracks in ten annual installments of 10 per cent each. If the city orders the tracks off any of the streets, the payments are to cease. Mr. Doherty insisted that he would accept no contract that would allow the city to remove tracks from streets where the company was paying for a portion of the pavement. A resolution ordering tracks removed from Huron Street, passed two years ago, is to be repealed before the Council takes action on this contract.

Appointments Made to Detroit Commission.—Mayor Marx of Detroit, Mich., has appointed Francis C. McMath, president of the Canadian Bridge Company, Ltd., and Julius H. Haass, president of the Wayne County & Home Savings Bank, to the Street Railway Commission of that city. They succeed James Wilkie, who resigned recently on account of ill health, and James Couzens, who resigned some time ago to become commissioner of police of Detroit. Neither Mr. McMath nor Mr. Haass has held public office previously. Brief reviews of the careers of both of these gentlemen appear elsewhere in this issue. The commission is composed of three members. The other member is John F. Dodge of Dodge Brothers, automobile manufacturers. The members of the commission expect to confer soon with the members of the Council committee on public utilities to consider the matter of subway construction.

Electrification of Evergreen Line Proposed.—The Long Island Railroad has informed the Public Service Commission for the First District of New York that it is its intention to electrify its Evergreen branch in Brooklyn and Queens as soon as possible. This electrification is desired by the commission in view of the fact that the city through the commission proposes to take an easement over the Evergreen right-of-way for the erection of a portion of the elevated section of the Fourteenth Street-Eastern District line. The railroad, however, has requested the commission that the proposed easement deed between the commission and the company provide that the use of electricity by the company shall not be required until two years after the completion of the rapid transit line.

Other Toledo Franchise Provisions Considered. — On March 26 Henry L. Doherty, of H. L. Doherty & Company, who operate the Toledo Railways & Light Company under contract, met Johnson Thurston and Judge Ralph Emery. Mr. Doherty objected to a requirement that practically every act of the company be approved by some representative of the city. He said that the company should be allowed to go about its business without undue interference, but that the city should receive every facility for learning about the company's affairs. Mr. Doherty met Messrs. Thurston and Emery again on March 27. About forty conditions of the proposed franchise remain to be agreed upon. It was expected that they would be brought before the full street railway commission some time during the week commencing April 1.

$1,000,000 Decrease in Valuation Sought in Tax Case.—Demanding a decrease of $1,029,032 on the valuation of its property for the year 1916, the Trenton & Mercer County Traction Corporation, Trenton, N. J., has appealed to the State Board of Taxes & Assessment from the findings of the county board. The corporation's suit to have the 1915 levy lessened by $1,000,000 is pending before the Supreme Court. The State board fixed upon April 2 and 3 for the hearing, but planned to continue the matter on April 10 and 11 if necessary. Some time ago the company appealed to the State Board of Utility Commissioners, complaining that it was not getting a proper return from its investment. The taxing districts then moved to assess the property at a figure nearer that which the company itself fixed in its appeal to the Public Utility Commission. Protests were voiced by the company, which contends that the value given for rate-making purposes has no bearing on that submitted for tax assessments.

Commission Objects to Inclusion of Fine in Expenses.—The Public Service Commission for the First District of New York has notified the New York Consolidated Railroad and the New York Municipal Railway Corporation, Brooklyn, formed in the interest of the Brooklyn Rapid Transit Company to operated the rapid transit lines assigned to it under the dual rapid transit plan, that it objects to the inclusion as a part of operating expenses by the companies of the $500 fine imposed by Judge Roy in the Kings County Court on John J. Dempsey, superintendent of transportation of the Consolidated company. The fine was imposed following Mr. Dempsey's conviction for violation of an order issued by the commission. A letter has been sent to the two companies to the effect that the commission objects to the inclusion of the amount in question in operating expenses, and to the inclusion under such expenses of any other expenditure made or to be made in connection with Mr. Dempsey's conviction. The commission describes such inclusion as unreasonable and improper.

Proposal for Operation of Municipal Extension Rejected.—Mayor Fawcett and the City Commissioners of Tacoma, Wash., at a recent meeting refused a proposal of Louis Bean, manager of the Tacoma Railway & Power Company, which provided that the city enter into a contract with the Tacoma Railway & Power Company for the extension of the present municipal railway to the plant of the Todd Shipbuilding & Repair Company. The company had stipulated that it be permitted to operate the line "at a fare which will return a sufficient revenue to warrant it in entering into the contract." The communication is the first official answer made to the city's resolution, in which the Council pledged itself to build the extension to the Todd plant, under the terms of the existing contract between the city and the company for the present municipal tideflats line, provided sufficient funds could be obtained to finance the extension. Mayor Fawcett stated that he would never sign a contract that called for an increase in the carfare to the tideflats. The City Commissioners concur in this decision. Mr. Bean, in his communication to the Council, expressed himself as agreeable to the terms of the existing contract, provided the plans of the city for the construction of the proposed extension contemplated a reasonable return on its investment.

Program of Association Meeting

Southwestern Electrical & Gas Association

The thirteenth annual convention of the Southwestern Electrical & Gas Association will be held in the Adolphus Hotel, Dallas, Tex., on April 26, 27 and 28.

The morning of the first day of the convention, April 26, will be devoted to the opening session, which includes the address of welcome and the response to it, the president's address. the election of new members, the appointment of the convention committee and other preliminary business. The street and interurban sessions will be held on the afternoon of that same day and the morning of the next day, Friday. The gas sessions will be held at the same time as those of the street and interurban railway sessions on Thursday and Friday, but these will be held in separate rooms. The electric light and power sessions will be held on the afternoon of April 27 and the morning of April 28. The general session will be held early in the afternoon of April 28. At this session will be discussed matters of interest and value to all the members of the association. The business session will follow the general session. At this session the reports of the treasurer and all committees will be presented, and officers and standing committees will be elected for the ensuing year.

The papers and addresses have been selected by the several section committees of gas, electric light and power, and street and interurban railways, with special reference to the present needs of the members of their respective sections. It has been deemed best by all three of these committees to devote one of the two sessions of each to practical operating subjects and the other session to executive, administrative and public policy matters. A list of the papers and addresses will be sent at an early date and the papers will be distributed to all interested some time before the convention.

Applications for hotel reservations should be made direct to the hotel at which it is desired to stop, or to the secretary of the association.

The members of "Class B" are to be the principal hosts of the convention this year, and have laid out a liberal plan of entertainment for the attending "Class A" members, visitors and guests—with special attention to the ladies who will attend the convention. The Dallas Electric Club has also arranged to entertain the visiting ladies. The rejuvenation of the Jovians will occur on the evening of April 27 and a special entertainment for the ladies and those men who are not Jovians has been arranged for that evening.

Financial and Corporate

Annual Report

Union Traction Company of Indiana

The comparative income statement of the Union Traction Company of Indiana, Anderson, Ind., for the years ended Dec. 31, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Revenue from transportation:				
Passenger	$2,332,219	83.62	$2,071,832	83.33
Baggage	9,475	0.34	10,539	0.42
Parlor, chair and special car	11,225	0.40	9,059	0.37
Mail	1,821	0.06	1,070	0.04
Express	91,844	3.29	81,867	3.30
Milk	24,882	0.89	24,724	0.99
Freight	250,560	8.99	223,751	9.00
Total	$2,722,026	97.59	$2,422,842	97.45
Revenue from operation other than transportation:				
Station and car privileges	$10,337	0.38	$9,208	0.36
Parcel rooms and storage	998	0.04	1,149	0.05
Rent of tracks and facilities	7,558	0.27	10,692	0.43
Rent of equipment	4,246	0.15	4,577	0.18
Rent of buildings and other property	8,412	0.30	7,682	0.31
Power	35,196	1.25	29,161	1.18
Miscellaneous	567	0.02	935	0.04
Total	$67,314	2.41	$63,404	2.55
Operating revenues	$2,789,342	100.00	$2,486,246	100.00
Operating expenses:				
Way and structures	$310,067	11.10	$261,192	10.50
Equipment	172,406	6.15	160,992	6.48
Power	279,578	10.02	229,344	9.22
Conducting transportation	476,084	17.06	456,637	18.38
Traffic	11,689	0.49	23,478	0.94
General and miscellaneous	349,422	12.52	318,407	12.80
Extraordinary flood expense charged in 1916	16,726	0.59	21,500	0.86
Total	$1,615,972	57.93	$1,471,550	59.18
Net operating revenue	$1,173,370	42.07	$1,014,696	40.82
Taxes	136,460	4.89	118,020	4.75
Operating income	$1,036,910	37.18	$896,676	36.07
Other income	16,983	0.61	17,895	0.72
Gross income	$1,053,893	37.79	$914,571	36.79
Deductions	865,148	31.02	857,238	34.48
Net income	$188,745	6.77	$57,333	2.31

The operating revenues for 1916 showed an increase of $303,096, or 12.2 per cent, as compared to those of 1915. Part of this gain, however, arose from the inclusion in 1916 of revenue from the Muncie-Portland line amounting to $63,320. This line, 32 miles long, was leased by the Union Traction Company in June, 1916. The remainder of the gain in operating revenues resulted mostly from increases of $260,387 or 12.5 per cent in passenger revenue, $26,809 or 11.9 per cent in freight revenue, $9,977 or 12.2 per cent in express and $6,035 or 20.6 per cent in power revenue.

The operating expenses as a whole rose $144,422 or 9.8 per cent, increases being shown in all the regular groups with the exception of traffic. As a result the gain in net operating revenues was $158,674 or 15.6 per cent. This was cut by a rise of $18,440 or 15.6 per cent in taxes, a falling off in other income and an increase of a few thousands in income deductions. The net income of the year at $188,745, however, showed a gain of $131,412 and was more than three times that of 1915. The balance in 1916, after deducting sinking-fund payments, was $132,227 as compared to $3,886 the year before, an increase of $128,341. The Oct. 1, 1914, first preferred dividend was passed and no dividend on this stock has since been paid. No dividends have been declared on the second preferred stock.

The total sum charged for maintenance during 1916, including the $16,726 for part of the 1913 flood expense, was $499,198. This equals 17.84 per cent of the gross earnings for the year and is equivalent to $1,225 per mile of single track operated, exclusive of city tracks of other companies at Indianapolis, Logansport and Wabash. The net amount charged for additions and betterments for the year was $146,160. Of this sum $97,163 was expended on way and structures. The principal item of this work was the alignment and double-tracking of about 1⅛ miles of the Anderson-Indianapolis line at the outskirts of Indianapolis, at a cost of $36,059.

Miscellaneous statistics for 1915 and 1916 are as follows:

	1916	1915
Passengers carried, interurban lines	9,992,101	9,037,691
Passengers carried, city lines	8,497,814	7,441,844
Total passengers carried	18,489,915	16,479,535
Freight handled (tons)	90,300	83,841
Express handled, exclusive of Wells, Fargo & Co. express (tons)	7,689	6,786
Mileage of cars, interurban lines	6,558,913	6,384,751
Mileage of cars, city lines	1,722,141	1,656,015
Total mileage of cars	8,281,054	8,040,766
Coal consumed at all plants (tons)	96,850	84,236
Power generated (a. c.) at all plants (kw.-hr.)	47,652,790	48,975,980
Power generated (d. c.) at all plants (kw.-hr.)	28,191,304	27,043,667

Bill Too Far Reaching

On This Account the Governor of New Jersey Has Vetoed the Bill to Reduce the Utility Board's Power

Governor Edge of New Jersey on March 29 disapproved of the McCran bill that public utilities should not be required to submit stock issues to the Public Utility Commission except for completion, acquisition or construction of property. The Governor said:

"This is a very important act, and while I am entirely in sympathy with the apparent desire that the jurisdiction of the Board of Public Utility Commissioners over the issuance of stock, bonds and other securities of public utility corporations should be limited to property within this State, at the same time it is my judgment that it is impracticable. Permission to issue securities of a corporation doing interstate business must frequently be requested for extensions going beyond the borders of the State, and it is questionable, if such an issue were contemplated and Senate bill 170 were to become a law, whether the Board of Public Utility Commissioners would have power to withhold its approval, which would defeat one of its principal protective responsibilities.

"In the explanation of the bill it is stated that a corporation operating within the State and outside would only be a public utility so far as operations within the State are concerned and hence the board would have no general supervision, regulation, jurisdiction or control over the activities of such corporation beyond the State limits.

"This is not borne out by any deduction from the decisions of our courts. It seems very difficult to make a division of inter and intra state on the question of issuing securities. If this could be done practically, I would be glad to approve the bill, but I am afraid this measure might prove too far-reaching in its effect."

For Joint Operation of E. U. R. Lines

A proposal to operate all the lines of the Empire United Railways, Inc., Syracuse, N. Y., of which the Rochester, Syracuse & Eastern Railway is a part, as one property was presented at a special meeting of the bondholders held in Syracuse. The proposal was made by Ford, Bacon & Davis, New York. According to a statement made by a representative of that company, the net earnings of the combined divisions of the company for the calendar year of 1916, as applicable to interest and dividends, were $427,548. It is stated that the net earnings of the Rochester, Syracuse & Eastern division, if operated independently, would not have exceeded $179,740. The report says in part:

"It is our judgment that the operation of all the divisions as one property would result in many economies, increase the net earnings, and bring a considerably higher market value for the securities hereinafter proposed to be issued to the Rochester, Syracuse & Eastern bondholders.

"The plan when approved and effective would include an option to sell for cash, on or before the reorganization, any or all of the bonds of the Rochester, Syracuse & Eastern Railroad, with November, 1915, and all subsequent coupons attached, at a price of $666.67 per $1,000 bond."

Traffic Increases in New York

165,778,235 Passengers in New York in January—Operating Income Decreases 4.17 Per Cent

The Public Service Commission for the First District of New York in its summary of street railway operations in the city of New York for January, 1917, reports a total of 167,798,694 passengers carried, compared with 158,778,235 in January, 1916, an increase of 9,020,459 or 5.56 per cent. Underground or elevated roads carried 75,804,467 passengers; Brooklyn Rapid Transit, 48,228,096; Manhattan surface roads, 30,582,651; Bronx surface roads, 7,800,129; Queens roads, 3,934,605, and other companies, 1,448,746. The total operating revenue amounted to $8,771,625, compared with $8,271,120 in January, 1916, an increase of $500,505 or 6.05 per cent. Maintenance totaled $5,008,870, an increase of $607,869 compared with January a year ago, or 13.81 per cent. Operating income amounted to $3,207,801, compared with $3,347,529 in January, 1916, a decrease of $139,728 or 4.17 per cent.

No-Par-Value Measure Vetoed

Governor Edge of the State of New Jersey on March 30 disapproved of a Senate bill to add a new section to the corporation laws authorizing shares of stock without the stated par value. New York is at present among the states that sanction the issuance of shares of stock without par value. One of the chief advantages that attaches to the issuance of such shares is that misconceptions are removed that are based on the idea that par value and actual value in some way correspond.

Bay State Street Railway, Boston, Mass.—The $80,000 of bonds of the Braintree & Weymouth Street Railway were paid at maturity on March 1. They will be replaced by $80,000 of Old Colony Street Railway 4 per cent bonds of 1904 due on July 1, 1954.

Boise (Idaho) Railroad, Ltd.—The federal court has authorized the sale of the Boise Railroad, Ltd., to satisfy an outstanding bond issue of $373,000. The minimum price that can be accepted as a bid on the road has been fixed at $182,000. There is also a charge of $28,000 standing against the company for paving bonds issued by the city, part of which is to be carried by the road for the pavement of its lines within the city.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—George Bullock, New York, N. Y., receiver for the Buffalo & Lake Erie Traction Company, has filed a petition with the County Court at Erie, Pa., for permission to issue receiver's certificates to the amount of $944,700 to provide funds for improvements and extensions to its lines between Buffalo and Erie. It is proposed to build a passenger and freight station at Dunkirk, N. Y., to cost $15,000, and approximately $20,000 will be spent for a new carhouse at Fredonia, and $7,500 for a new passenger and freight station at Brockton, N. Y., and an equal amount for like improvements at Westfield. Extensive improvements are also contemplated on the Buffalo & Hamburg and the Buffalo & Lackawanna divisions and on the lines within the city of Erie.

Cities Service Company, New York, N. Y.—At the annual meeting of the Cities Service Company held on April 3 the stockholders voted to increase the authorized preferred stock from $60,000,000 to $100,000,000 and the authorized common from $40,000,000 to $50,000,000. At the same time the action of the directors in providing that no dividends in excess of 6 per cent will be paid on the common stock until certain conditions are complied with was ratified by constitutional amendment. J. C. McDowell, Pittsburgh, and M. R. Bump, New York, were elected new directors of the company. An extra dividend of half of 1 per cent had previously been declared on the common stock of the Cities Service Company, payable in stock, along with the regular monthly half of 1 per cent declaration on both the common and the preferred shares, all payable on May 1 to holders of the company's stock of record of April 15.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.—The Cleveland, Southwestern & Columbus Railway has been authorized by the Ohio Public Utilities Commission to issue its first consolidated mortgage twenty-year 5 per cent bonds to the amount of $201,836 to reimburse the treasury for funds advanced for improvements between Jan. 1, 1915, and Aug. 31, 1916.

Lewisburg & Ronceverte Electric Railway, Lewisburg, W. Va.—The Lewisburg & Ronceverte Electric Railway is reported to have been purchased by H. L. Van Sickler and W. S. Coursey. The company operates 6.2 miles of line.

Long Island Railroad, New York, N. Y.—A special meeting of the stockholders of the Long Island Railroad was held on March 29 to act upon a resolution of the directors increasing the capital stock from $12,000,000 to $40,000,000. There were represented by person and proxy 171,892 shares out of an outstanding issue of 240,000 shares, all of which was voted in favor of the resolution. The directors met and took necessary action on an application to be filed promptly with the up-State Public Service Commission, asking for authority to issue the increased amount of capital stock and also the $5,202,100 debentures provided for in the plan and which are to be taken by the Pennsylvania Railroad in payment of advances made to the Long Island. As soon as the authority is granted by the commission the actual issuance of the new securities and the exchange of the old ones will take place.

Louisville (Ky.) Traction Company.—Plans for the dissolution of the Louisville Traction Company, a New Jersey corporation, and the holding company for the Louisville Railway, are expected to go forward, now that the will of Lady McDonnell has been probated in New York, thus establishing the status of the stock owned by that estate. The purpose of dissolution of the company is to effect an annual saving of between $35,000 and $40,000 in federal and state taxes, changed laws and conditions having removed the reasons which made the holding corporation desirable. The dissolution will be effected by giving the holders of stock of the traction company shares in the Louisville Railway. It is stated that holders of preferred stock will exchange on a share for share basis, while holders of Traction common will receive two shares of Railway common for each three shares of Traction common, the capitalization thus being reduced from approximately $12,000,000 to $8,000,000. The common stock at the present time pays 4 per cent. On the new basis it would pay 6 per cent. The stock disposed of in the will mentioned was that of the late Alexander Henry Davis. It amounts to more than $3,000,000, and is left to a son of the testator, daughter of Major Davis. Frederick S. Wicks, Syracuse, N. Y., who is named executor of the estate, is a director of the Louisville Traction Company.

Montreal Tramways & Power Company, Montreal, Que.—The Montreal Tramways & Power Company has sold to Potter, Choate & Prentice, New York, N. Y., $5,350,000 of two-year 6 per cent secured notes, the proceeds of which will be used to retire, on April 1, $7,000,000 of the company's two-year 6 per cent collateral trust notes, the remainder to be paid in cash by the company. The new issue will be secured by $6,000,000 of Montreal Tramways 5 per cent debenture stock and 16,000 shares of the common stock carrying the voting control of the Montreal Tramways. The aggregate market value of the collateral to be pledged at current quotations is $7,600,000, or more than 140 per cent of the notes to be issued. It is understood that holders of the maturing notes will be offered an opportunity to exchange their holdings at par and interest for a like amount of new notes at 98 and interest and that it is proposed to offer the unsold balance in the near future at 98½ and interest.

Portland Railway, Light & Power Company, Portland, Ore.—The success is reported of the stock conversion plan of the Portland Railway, Light & Power Company, the terms of which were outlined in the ELECTRIC RAILWAY JOURNAL of March 3, page 409. As the result of the success of the plan there will be outstanding $5,000,000 of 6 per cent cumulative first preferred stock, $5,000,000 of 6 per cent non-cumulative second preferred stock and $15,000,000 of common stock, 75 per cent paid. The time for conversion expired on March 15.

Scranton (Pa.) Railway.—The stockholders of the Scranton Railway voted on March 26 to reduce the preferred stock by the entire outstanding amount of $1,500,000. This will leave outstanding only $2,060,000 of common stock of a total authorized issue of $4,500,000. The retirement of the preferred stock is in accordance with the plan of the American Railways, the controlling company, which elected some time ago to purchase the preferred at 102½ and the accrued dividend.

Southwestern Traction Company, Temple, Tex.—The suit of the Susquehanna Trust & Safe Deposit Company, Williamsport, Pa., against the Southwestern Traction Company, has been disposed of in the United States District Court for the Western District of Texas sitting at Waco, Tex. The court has entered judgment for the plaintiff to the amount of $130,000 with interest, and has ordered the sale of the mortgaged property. C. E. Pinckney, Austin, has been appointed commissioner to take further testimony on behalf of any party to the cause, while J. B. Durrett, Belton, has been appointed master to determine priority of liens. W. G. Haag was named receiver for the property some time ago on application of the Susquehanna Trust & Safe Deposit Company.

Texas Electric Railway, Dallas, Tex.—Directors of the Texas Electric Railway at a meeting in Dallas on March 21 elected three new members to their board: C. N. Mason, New York; Allen T. West, St. Louis, and W. D. Lacy, Waco. The company is a consolidation of the Southern Traction Company and the Texas Traction Company.

Trans-St. Mary's Traction Company, Sault Ste. Marie, Mich.—The Trans-St. Mary's Traction Company defaulted in the payment of the interest due on Jan. 1 on its fifteen-year 5 per cent bonds. The National Trust Company, Ltd., Toronto, Ont., is calling for the deposit of the bonds, with it, preparatory to a meeting of the bondholders.

Underground Electric Railways, Ltd., London, England.—The British Treasury has approved the renewal of the £700,000 of three-year 5 per cent notes of the Underground Electric Railways, Ltd., due on April 1, 1917.

United Gas & Electric Corporation, New York, N. Y.—The United Gas & Electric Corporation has completed arrangements for the purchase of a half interest in about 514 acres of producing oil and gas properties in the well-known Augusta Pool, Butler County, Kan. The corporation is itself a large user of fuel and oil. The purchase of this new property has been made in part to offset advancing prices and in part to realize a promising business opportunity. To finance the purchase, a new oil company is to be organized to take over the newly acquired half interest. This company will issue $2,000,000 of five-year first mortgage 7 per cent bonds, and 80,000 shares of capital stock of $5 par value. The majority of the stock of the oil company will be owned by the United Gas & Electric Corporation. The purchase funds have been obtained through the sale of these bonds and the balance of the stock of the oil company to a banking syndicate consisting of Bertron, Griscom & Company, and associates.

Washington Water Power Company, Spokane, Wash.—The merger bill which will permit the consolidation of the local lines of the Washington Water Power Company and the Spokane & Inland Empire Railroad in Spokane, passed both Houses of the Legislature, and has survived the time limit set for the Governor to accept or reject it. The representatives of the companies have been awaiting the outcome of the bill which permits the merger. The move toward the consolidation of the companies came as a result of a recent opinion handed down by the Public Service Commission, forbidding the abandonment of owl cars as a measure of economy and requiring the companies to obtain the consent of the commission to the use of one-man cars. As noted in the ELECTRIC RAILWAY JOURNAL of Jan. 27, page 184, the commission actually suggested the merger plan as a substitute. Attorneys for the companies acted at once upon the suggestion and the bill that has just become a law providing for the lease or consolidation of the properties was introduced in the Legislature.

Dividends Declared

Boston (Mass.) Suburban Electric Companies, quarterly 50 cents, preferred.

Central Illinois Public Service Company, Mattoon, Ill., quarterly, 1½ per cent, preferred.

Cincinnati & Hamilton Traction Company, Cincinnati, Ohio, quarterly, 1¼ per cent, preferred; quarterly, 1 per cent, common.

Cincinnati, Newport & Covington Light & Traction Company, Covington, Ky., quarterly, 1⅛ per cent, preferred; quarterly, 1½ per cent, common.

Cincinnati (Ohio) Street Railway, quarterly, 1½ per cent.

Citizens' Traction Company, Oil City, Pa., quarterly, 1⅛ per cent, preferred.

Cleveland & Eastern Traction Company, Cleveland, Ohio, quarterly, one-half of 1 per cent, preferred.

Columbia Railway, Gas & Electric Company, Columbia, S. C., quarterly, 1½ per cent, preferred.

Harrisburg (Pa.) Railways, 1¾ per cent, preferred.

Honolulu Rapid Transit & Land Company, Honolulu, Hawaii, quarterly, 2 per cent.

Iowa Railway & Light Company, Cedar Rapids, Iowa, quarterly, 1¾ per cent, preferred.

Springfield & Xenia Railway, Xenia, Ohio, quarterly, 1⅛ per cent, preferred.

Stark Electric Railroad, Alliance, Ohio, quarterly, 1 per cent.

United Railways & Electric Company, Baltimore, Md., quarterly, 50 cents, common.

Virginia Railway & Power Company, Richmond, Va., 1⅛ per cent, common.

Wisconsin Edison Company, New York, N. Y., quarterly, $1.

York (Pa.) Railways, quarterly, 62½ cents, preferred.

Electric Railway Monthly Earnings

ARKANSAS VALLEY RAILWAY, LIGHT & POWER COMPANY, PUEBLO, COL.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '17	$108,040	$56,576	$51,464	......	......
1 " " '16	99,028	54,729	44,299	......	......
12 " " '17	1,277,947	90,506	1,187,441	......	......
12 " " '16	574,683	58,935	515,748	......	......

ATLANTIC SHORE RAILWAY, SANFORD, ME.

1m., Feb., '17	$22,040	*$22,048	†$8	......	......
1 " " '16	21,081	*19,004	2,077	......	......

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

1m., Feb., '17	$76,080	*$67,396	$8,684	$27,550	†‡$18,746
1 " " '16	68,031	*59,957	8,074	22,323	†‡14,053
8 " " '17	699,785	*567,032	132,753	221,107	†‡87,032
8 " " '16	638,850	*528,073	110,777	151,516	†‡39,326

CONNECTICUT COMPANY, NEW HAVEN, CONN.

1m., Feb., '17	$720,688	*$581,155	$139,533	$91,022	‡$40,084
1 " " '16	681,372	*477,232	204,140	97,450	‡129,352
8 " " '17	6,578,076	*5,131,537	1,446,539	782,173	‡845,212
8 " " '16	5,835,300	*3,932,572	1,902,728	788,791	‡1,298,580

FEDERAL LIGHT & TRACTION COMPANY, NEW YORK, N. Y.

1m., Feb., '17	$229,813	*$148,246	$81,567	$49,210	$32,357
1 " " '16	216,157	*143,715	72,442	48,637	23,805
2 " " '17	473,691	*298,511	175,180	98,936	76,244
2 " " '16	441,700	*295,219	146,481	97,392	49,089

NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.

1m., Feb., '17	$39,600	*$44,826	†$5,226	§$10,024	†‡$13,225
1 " " '16	36,414	*80,220	†43,806	§9,624	†‡52,098
8 " " '17	393,827	*380,970	12,857	§58,386	†‡36,155
8 " " '16	335,319	*378,970	†43,651	§52,174	†‡82,816

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

1m., Feb., '17	$424,512	*$349,329	$75,183	$119,111	†‡$43,067
1 " " '16	410,857	*317,425	93,432	118,373	†‡23,742
8 " " '17	3,973,647	2,942,815	1,032,832	959,851	‡134,325
8 " " '16	3,595,335	*2,733,646	861,689	924,053	‡993

WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.

1m., Feb., '17	$16,220	*$21,288	†$5,068	$2,018	†‡$7,061
1 " " '16	16,533	*20,302	†3,769	1,725	†‡5,467
8 " " '17	138,762	*156,078	†17,316	15,510	†‡32,615
8 " " '16	168,363	*172,292	†3,929	13,288	†‡16,983

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*Includes taxes. †Deficit. ‡Includes non-operating income. §Excludes interest on bonds, charged income and paid by the New York, New Haven & Hartford Railroad under guarantee; also interest on notes held by the New York, New Haven & Hartford Railroad, not credited to income of that company.

Traffic and Transportation

One-Man Cars Authorized

Trial of Cars of This Type Authorized for Two Companies in Massachusetts

Acting on petitions of the Boston Elevated Railway and the Brockton & Plymouth Street Railway, Plymouth, Mass., the Public Service Commission of Massachusetts has issued an order approving the trial use of one-man cars on certain routes as specified in the account of a hearing on this subject published in the ELECTRIC RAILWAY JOURNAL for March 31, page 616. Permission to operate one-man cars has been refused in the past by the commission and its predecessor, the Massachusetts Railroad Commission. In 1903 and 1915 it was proposed to employ for one-man operation a car very similar to the ordinary car in charge of two men, but to use only the front door and some form of prepayment device. In the present instance, both companies desire to use a one-man car provided with the most improved safety devices.

The decision points out that since such cars permit more economical operation, they are clearly a public benefit and ultimately contribute to the welfare of the employees, although opposition to the cars was raised by the employees' union at the hearing. The commission reserved its opinion on the fitness of cars of this type to give adequate service on the lines in question.

Hearing on Connecticut Service

Fares, Paving and Scarcity of Cars and Men All Receive Attention Before Connecticut Commission

The hearing before the Public Service Commission of Connecticut with respect to the service furnished by the Connecticut Company in New Haven, Hartford, Bridgeport, Waterbury and the other cities in which the company operates, was continued before the members of the commission at Hartford on March 31. One of the suggestions made to the company was that it endeavor to have the Legislature repeal that part of the law which provides that the company shall pave and keep in repair a certain portion of the streets through which its lines run, so that the money now spent for this paving could be used to buy cars and otherwise improve the service.

IMPOSSIBLE TO SECURE CARS

The officials of the company had been instructed to be prepared to answer in detail seventeen questions prepared by the commission. Judge Walter C. Noyes, chairman of the board of trustees, replied for the company and said that the trustees would do everything within their power to meet the orders of the commission. In explaining the condition of the company, Judge Noyes said that an order for 100 cars urgently needed to be delivered last October had not yet been filled, on account of the congestion which has occurred in all lines of industry during the past year. Even now it was not certain when the new cars would be received. Overcrowding was principally during rush hours. The company's records showed that the average number of passengers carried per car-mile operated was 7.7. Judge Noyes said that the company had been very seriously handicapped by the difficulty of securing and retaining men, either in sufficient numbers or of proper grade and experience, to conduct transportation, do shop work, or maintain the way.

COMMISSIONER DISCUSSES FARES

Chairman Richard T. Higgins of the commission was quoted as follows:

"There is a great demand for better service, and the only result is that if better service is to be rendered it must be paid for by the people who get that service. If the company can render such improved service with its present rates that is so much the better. It would be unwise to undertake to charge a higher rate for service so long as the present character of service is being given. If the rates are to be raised they should first be preceded by an improved service that will make such an increase warranted."

Commission Permits Fare Increase

After a hearing on the complaint against permitting the Geneva, Seneca Falls & Auburn Railroad, Seneca Falls, N. Y., to increase its fares, the Public Service Commission for the Second District of New York decided that the increase was warranted and the case was dismissed. Upon the opinion of Commissioner Irvine, in which he showed that the company was earning only a fraction of the return to which it was entitled upon the property invested, the commission permitted the company to put into effect its proposed new tariff creating a new fare zone between Geneva and Waterloo, with the consequent addition of 5 cents to the fare from Geneva to Waterloo, Seneca Falls and Cayuga Lake Park.

The opinion points out, however, that as commutation tickets at the old rates are retained for persons who reside in Waterloo and work in Geneva and vice versa, the increase will work no great hardship on regular patrons. The commutation books hold twenty tickets and will continue to be sold for $2, good during morning and evening rush hours. Twenty-ride tickets, good at any time, will be sold for $2.50. As to the complaints over the rearrangement of zones, Commissioner Irvine said that no zone system could be established without some apparent injustice to those just across zone lines. He said that no injustice had been effected in this case, but he regarded this to be a matter for careful study. He said further that if the hours were not suitable during which the commutation tickets were good this can be made the subject of future action.

While the commission's investigation of the finances of the company revealed that the operating income and expenses had remained almost constant, there had been an increase in taxes, paving charges, and for this year also in wages. Surplus revenues were found to be insignificant, with no special reserve for depreciation, and no dividends had been paid by this company or its predecessor since June, 1909. The commission also found that the company's interest charges were not excessive.

Higher Fares Upheld

Increased Revenue Effected by Various Changes Is Granted by Patrons After Commission Analyzes Financial Situation

Fare increases amounting to a maximum of 3 cents above an existing 7-cent rate have been permitted by the Public Service Commission of Massachusetts in an order relative to the petition of the Ware & Brookfield Street Railway, Ware, Mass., for authority to establish a higher tariff. Various changes in rates were requested by the company, including the shortening of a fare zone between Ware and Gilbertville, the establishment of a 7-cent cash fare for every local ride within the limits of all fare zones except that between New Braintree Road and Gilbertville, the establishment of a regular cash fare of 10 cents instead of 7 cents between Ware and Gilbertville or intermediate points, the increase of workingmen's fares from 5 cents to 7 cents between the last-named points, and the establishment of a 12-cent workingmen's fare from Ware to West Brookfield or intermediate points in place of the former rate of 10 cents.

The commission analyzed the company's financial situation and found that the population of the four towns served by the road increased from 13,414 in 1900 to 14,683 in 1915. The road was originally built by the Hampshire & Worcester Street Railway, which went into the hands of a receiver in 1905 with liabilities of $355,000. The reduction in liabilities effected through the receivership was about $120,000. Since the reorganization the company has never earned the interest on its debt and has earned its operating expenses in only two years. On June 20, 1916, the total profit and loss deficit amounted to $149,441.

The decision points out that the present owners have "at marked personal sacrifice" done a great deal since 1908 to improve the property and that it is on the whole well maintained. The owners stated, however, that if they cannot bring the road up to meet its operating expenses and a very reasonable depreciation it will be necessary to discontinue operation. "The proposed increase in rates," the decision states, "is in the nature of a last resort. Assuming no decrease in traffic it is estimated that it may produce about $12,000 additional revenue per year, or substantially the amount of operating deficit in 1916. While maintenance expenditures in that year were perhaps above normal, and while the company has recently contracted for a supply of power on terms favorable in comparison to the cost of that generated in its own small power plant, which has now been abandoned, it is also true that the increase in fares is likely to discourage riding, so that net results are still uncertain. There is no reason to believe that the increase will enable the company to earn even the full interest on its funded debt. If it earns operating expenses it will, it seems, be doing very well." The patrons appreciated the company's position and the desired rate changes were granted.

Cars Have Right of Way

Vehicles Prohibited from Delaying Them in Oakland—Pedestrians Must Cross Streets Only at Corners

A new traffic ordinance which has just been passed in Oakland, Cal., provides in Sec. 10 that "No person shall drive, propel or stop any horse or vehicle on any highway in the city of Oakland over which are operated any street cars or interurban cars in such a manner as to unnecessarily hinder or delay the operating of such cars; and street cars and interurban cars shall have the right of way over vehicles at all intersecting highways not controlled by police traffic officers." Another important provision states that "Pedestrians shall not cross highways where traffic officers are stationed except with the traffic as controlled by traffic officer's signal. Pedestrians shall not cross highways in District No. 1 except at intersecting highway corners, and no pedestrian shall cross any intersecting highway diagonally in District No. 1."

At the back of the pamphlet in which the new traffic ordinance is published in convenient shape for motorists appear nineteen diagrams illustrating various problems involved in city automobile traffic. Of these nineteen diagrams, ten show the location of street car tracks and refer specifically to the relation which traffic movements bear to the operation of street cars.

Unprofitable Service Discontinued

Bay State Street Railway Anncunces Abandonment of Service on Line Giving No Promise of Ever Paying

The Bay State Street Railway, Boston, Mass., has announced that on April 8 it will discontinue service between Wilmington Square, in the town of Wilmington, and Billerica Center, in the town of Billerica. P. F. Sullivan, president of the company, issued a statement in which he said:

"Our business is to serve the people in our territory where it can be done at a profit, or nearly so. It is manifestly unfair, however, to the company and to the other communities served by the company, which must necessarily pay their share of the operating costs, to continue to operate lines which not only do not pay a profit, but which actually create losses. If there was any guarantee that the line between Wilmington Square and Billerica Center would ever pay, we might be justified in continuing to operate it, but that territory can give no such guarantee.

"In discontinuing this service we are doing what every wise business man would do if he were permitted to use his best judgment. If the company were prosperous, and the profits made elsewhere justified it, we might have some excuse for giving service to communities which do not even pay operating expenses. The present condition of the company's finances clearly does not justify the management in running cars through territory that yields so little business."

Jitneys Lose Bond Case

Supreme Court Rules That Liability for Accidents Is Not Limited to the Amount of the Bond —Jitneys Face Difficulties

According to a ruling of the Supreme Court in a divided opinion affirming Judge Mitchell of the King County Superior Court, at Seattle, Washington, in the case of Sigrid Salo et al. against the Pacific Coast Casualty Company, appellant, a jitney bus bonding company is liable for the full amount of the bond for each person injured in the jitney bus through negligence of the operator, and the collective liability is not necessarily limited to the amount of the bond. The Salo case arose from a collision of an automobile with a jitney bus, bonded in the sum of $2,500 as required by the 1915 Legislature. Five passengers were injured and brought suit, Salo recovering $3,700, while the other four received $1,500, $500, $200 and $100, respectively. The court granted a new trial in the $500 case, and appeals were taken in the four other cases. Under the Supreme Court ruling the total liability for the five injured passengers would be $12,500, while the company contends the collective liability would be $2,500. Judges Mount, Chadwick, Morris and Fullerton dissented to the ruling of the Supreme Court, laying stress upon the fact that the bonding company is compensated by the jitney operator for a liability of but $2,500, and to hold that the liability exceeds that amount would place an unjust burden on the company.

JITNEYS MAY ABANDON SERVICE

Unless a bonding company can be found to furnish the necessary security, 300 jitneys in Seattle will be forced out of business between now and Nov. 1, upon the expiration of their bonds. That the jitney owners themselves doubt their ability to obtain bonds was indicated recently when several plans were proposed with a view of retaining the jitney in the transportation field. One of these plans provided that the City Council pass an ordinance ostensibly regulating the operation of jitneys and in reality providing for a city bond. The Council favored the jitneys, but no one was willing to introduce a measure such as proposed, particularly when it was considered that furnishing a city bond would not relieve jitney operators from furnishing a bond in compliance with the State law. Another plan provided for operation without a license, and demanded jury trials in cases of arrest, with the hope that public opinion would tend to minimize the offense in the event bonds were not available. It was also suggested that jitneys and motor buses cease operating upon the expiration of bonds in the hope that there would be a demand so insistent for motor transportation facilities, particularly in suburban districts, that non-enforcement of the bonding law would be successfully urged by such communities.

Harrisburg Survey Begun.—Bion J. Arnold has entered upon his study of traffic conditions in Harrisburg, Pa., for the Harrisburg Railways. The work is in immediate charge of J. R. Bibbins.

Petition for Sleeper Service.—The Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has been petitioned by residents of Fort Wayne to provide sleeper service between Fort Wayne and Indianapolis. There is now no through sleeper service between the cities.

Jitneys Issue 5000 Transfers Per Month.—The company which is operating a jitney system at Long Beach, Cal., in its first two months of operation under franchise, has issued 10,000 transfers, according to Ray S. Julian, president of the company. Under the old method of operation no transfers were issued.

I. T. S. Issues Attractive Time-table.—The Illinois Traction System, Peoria, Ill., is advertising service on its Chicago, Ottawa & Peoria and its Peoria-Springfield-St. Louis and Danville-Springfield-St. Louis Lines in a folder 3½ in. wide by 6¼ in. high, printed in colors and very well displayed typographically.

Company Publication Proves Popular.—*The Pretzel*, a four-page leaflet published by the Reading Traction & Light Company, Reading, Pa., in its issue for March 16, which marks its entrance upon the second year of its publication, states that an average of 20,000 copies a week were distributed on the cars during the past year to supply the demand.

Commission Halts Operation of Jitneys.—The Public Service Commission of Pennsylvania has issued orders directing fifty-two jitney operators in Wilkes-Barre to cease operating. The action followed a complaint filed by the Wilkes-Barre Railway. It does not prevent the operators from filing with the commission applications for certificates of public convenience. These, if filed, will be considered as an entirely new matter.

Co-operative Safety-First Campaign Successful.—The International Railway, Buffalo, N. Y., is co-operating with almost a score of large Niagara Falls and Lockport electro-chemical and electric generating industries in one of the most extensive safety-first publicity campaigns ever undertaken by a combination of corporations. Page advertisements are being used in the daily newspapers of Niagara County in an effort to educate employees on the prevention of accidents, and officials of the International Railway are enthusiastic over the results that have already been achieved.

New Cars for Schenectady Railway.—The Schenectady (N. Y.) Railway, which is a subsidiary of the New York State Railways, has received sixteen new cars similar to those recently put in service on other lines of this system. The city cars are duplicates of those purchased for the Rochester lines, which were described in the ELECTRIC RAILWAY JOURNAL for Dec. 16, 1916, page 1234. The interurban cars have double-end equipment, and are otherwise the same as those in operation on the Utica lines. These were described in the issue of this paper for Feb. 10, page 256.

Jitney Drivers Would Delay Franchises.—Four franchises of the Portland (Ore.) Trackless Motor Company, which have been passed recently by the City Council, will be submitted to the voters for their approval at the municipal election on June 4, according to a recent announcement of Commissioner Dieck, of the department of public works. The action is to block the efforts of the Jitney Drivers' Union to have the franchises held in abeyance for two years. It was the plan of the union drivers to invoke the referendum on the franchises after it was too late to submit them to the voters at the coming election, and thus make the franchises inoperative until the next municipal election, two years hence.

More Railway Property to Be Cultivated.—L. B. Martin, engineer of maintenance of way of the Illinois Traction System, Peoria, Ill., reports a large number of requests this year for the privilege to cultivate the right-of-way. These requests, most of which are for garden spots, come from employees, city residents and farmers. A lease running from one to five years is being given to these applicants with a sixty-day release clause to provide for any unexpected use the company may have for the ground. The rental charged is at the rate of about 6 per cent on the value of the property. In harmony with this movement to reduce the cost of living by producing more food, L. S. Storrs, president of the Connecticut Company, New Haven, Conn., plans to offer for public gardening all the land owned by this company which is not in use.

Car Heating Problem in Buffalo.—The International Railway, Buffalo, N. Y., has awarded a contract to the Peter Smith Heater Company, Detroit, Mich., for 350 stoves to be delivered about Sept. 1 for use on the new center-exit cars and the near-side pay-as-you-enter cars. Announcement of the change in the method of heating its city cars was made to the City Council by Thomas Penney, vice-president and general counsel of the International Railway, at a hearing on the provisions of the new sanitary code which affects the heating, ventilation and overloading of cars. In view of the company's efforts to improve its facilities, the commissioner of health, who is urging the enactment of the code, many of the provisions of which are branded as ludicrous, voluntarily offered to amend the code so that the minimum temperature in cars should be 40 deg. Fahr., instead of 50 deg. Fahr.

Survey of Buffalo Traffic in Progress.—Charles R. Barnes, electric railway expert for the Public Service Commission for the Second District of New York, and several assistants are in Buffalo, N. Y., making a survey of traffic conditions on the city lines of the International Railway. Special attention is being paid to rush-hour congestion in the Main Street business district and in several north-end industrial centers. For several months N. H. Brown, general superintendent of transportation, and T. W. Connette, superintendent of the Buffalo city lines, have been making a study of traffic conditions at several industrial centers, and a rerouting plan has been practically agreed upon. The company has expressed its desire to co-operate with the traffic commission appointed by the Mayor to relieve congestion in the downtown district. In his report Mr. Barnes will probably recommend the rerouting of several lines which now use Main Street to reach the business section.

Crowds Carried Successfully in Buffalo.—During the eight weeks of the Billy Sunday campaign in Buffalo, N. Y., the International Railway carried approximately 500,000 passengers to and from the tabernacle. N. H. Brown, general superintendent of transportation, who planned the traffic arrangements, estimates that the company carried approximately 50 per cent of the crowds at the afternoon and evening services. In Syracuse the New York State Railways and the interurban lines carried about 66 per cent of the crowds, but the percentage was lower in Buffalo because of the central location of the great gospel shed. Between fifty and seventy cars were used to carry the tabernacle crowds in addition to extra cars on the interurban lines and chartered cars for special delegations. It is estimated that the increased gross earnings of the company during the campaign will exceed $60,000. On the closing day of the campaign Mr. Sunday paid high tribute to the International Railway for the manner in which its cars were mobilized and the efficient handling of the immense crowds.

Boston Elevated Orders Drawbridge Stops.—The Boston (Mass.) Elevated Railway has issued an order requiring all surface cars on the system which traverse one or more highway drawbridges to be brought to a full stop 100 ft. before reaching the draw. The car is allowed to proceed in each case only upon receiving two bells from the conductor after the conductor and the motorman have found the draw to be closed and the way clear. Conductors are required to step off the platform—those on articulated cars to step off the platform from the center compartment—to observe the position of the drawbridge gates, and if the way is clear to board the car and signal the motorman. Sixteen drawbridge crossings are listed in the order. By direction of the Massachusetts Public Service Commission safety stops are to be made at all highway drawbridges, and the foregoing rule is effective until the necessary locations can be obtained and the required drawbridge stop signs installed. The movement of cars over the East Cambridge viaduct is governed by special rules, disappearing track bumpers being in service at that point.

Attempt to Compel Reduction in Fare.—An attempt is being made by the patrons of the United Traction Company, Albany, N. Y., to secure a reduction in fares on its Albany-Troy line, according to a bill introduced in the Legislature by Assemblyman John F. Shannon. This measure would prohibit the company from charging more than a 10-cent fare from any point in Albany and Rensselaer to any point in Troy, and compel the issuance of transfers. At a recent hearing on the bill before the Assembly railroad committee, Harry B. Weatherwax, vice-president of the company, offered to give transfers at both ends of the Albany-Troy Line and half-hour service on the Albany-Troy steam belt line in return for a flat 15-cent fare. Officials of the company impressed upon the committee the burdens under which the company now labored, and declared that the enactment of such a law together with the increasing expenses resulting from taxes, claims, wages, and paving work would make the outlook unusually dark. It was also declared that free rides for policemen and firemen, and reduced rates for school children resulted in reducing the average fare to about 4 cents. The increasing use of automobiles was another factor which had affected the company's revenue.

Personal Mention

H. J. Jumonville has resigned as auditor of the American Cities Company at New Orleans, La., to take up local accounting.

Edmund W. Wakelee has been elected vice-president and a director of the Public Service Corporation of New Jersey, Newark, N. J.

George J. Roberts has retired from the position of first vice-president and as a director of the Public Service Corporation of New Jersey, Newark, N. J.

Percy S. Young, formerly treasurer of the Public Service Corporation of New Jersey, Newark, N. J., has been elected a vice-president and a director of the company.

William S. Barker, formerly assistant treasurer of the Public Service Corporation of New Jersey, Newark, N. J., has been appointed comptroller, which office was revived.

John L. O'Toole has been appointed assistant to the president of the Public Service Corporation, Newark, N. J. Mr. O'Toole was formerly publicity manager of the company.

Eugene Gorman, Elmira, N. Y., has been appointed inspector of the Corning & Painted Post Street Railway, Corning, N. Y., to succeed O. T. Riffle, who has been assigned to other duties.

R. C. Shepard, formerly assistant treasurer of the Key West (Fla.) Electric Company, has been transferred to the office of the treasurer of the Stone & Webster Management Association, Boston, Mass.

T. Wilson Van Middlesworth has been promoted from the position of assistant treasurer of the Public Service Corporation of New Jersey, Newark, N. J., to that of treasurer, succeeding Percy S. Young.

Harry J. Childs, formerly engineer of power and lines for the United Traction Company, Albany, N. Y., has accepted a position as electrical engineer with the Chateaugay Ore & Iron Company, Lyon Mountain, N. Y.

E. L. Patterson, formerly connected with the Stone & Webster Management Association, in the office of the treasurer, Boston, Mass., has joined the accounting staff of the American International Corporation in the New York office.

William H. Feller has been appointed assistant secretary of the Public Service Corporation of New Jersey, Newark, N. J., to succeed Harry C. Stevenson, who was appointed assistant to the vice-president in charge of public relations.

Dudley Farrand, formerly vice-president and general manager of the Public Service Electric Company, Newark, N. J., a subsidiary of the Public Service Corporation, that city, has been appointed assistant to the president of the latter company.

V. A. Miller, superintendent of the Ontario Light & Traction Company, Canandaigua, N. Y., and the Canandaigua Gas Light Company, has assumed charge of the transportation and coke sales departments of the Rochester Railway & Light Company, Rochester, N. Y., in addition to his present duties. Before Mr. Miller removed to Rochester the business men of Canandaigua tendered him a complimentary dinner.

Julius H. Haass, who has been appointed to the Street Railway Commission of Detroit, Mich., by Mayor Marx of that city, is a native of Detroit. He entered the service of the Home Savings Bank at the time of its organization in 1889 as messenger. He became cashier five years later, and president in 1899. With the consolidation of the Home and the Wayne County Savings Banks he was elected president of the combined organization. He is a director of the Detroit Trust Company, and a director and secretary of the George H. Clippert & Brother Brick Company.

Francis C. McMath, who has been appointed to the Street Railway Commission of Detroit, Mich., by Mayor Marx of that city, has lived in Detroit thirty years. He entered the employ of the Detroit Bridge & Iron Works in 1887, and became chief engineer of that concern in 1899. One year later he organized the Canadian Bridge Company, Ltd., of Walkerville. Other business capacities in which his efforts have been engaged include: President of the Trussed Concrete Steel Company, Walkerville; president of the Essex County Realty Company; director of the St. Lawrence Bridge Company, Montreal; director of the Structural Steel Company, Montreal; director of the Union Trust Company; director of the Maritime Bridge Company, New Glasgow, N. S.; director of the Essex Terminal Railway, Walkerville. Mr. McMath is a member of the Detroit Engineering Society and Canadian Society of Civil Engineers. He was one of the engineers selected to supervise the planning of the permanent bridge to Belle Isle, Detroit.

J. W. Hewitt, who has been superintendent of transportation of the Reading Transit & Light Company, Reading, Pa., for the last year, has returned to assume his former position of superintendent of the Sumpter Valley Railway, Baker, Ore. Mr. Hewitt entered railway service in 1892 with the New South Wales Railways & Tramways in Australia, where he operated the first electric cars in that country. In 1901 he became connected with the operating department of the Seattle (Wash.) Electric Company, now the Puget Sound Traction, Light & Power Company, and finally had charge of the employment and training of platform employees. From 1908 to 1914 Mr. Hewitt held various positions in the transportation department of the Portland Railway, Light & Power Company, Portland, Ore., and was superintendent of transportation of the interurban lines for the last five years of that period. He was then superintendent of the Sumpter Valley Railway for two years, and in 1916 was employed by the Reading Transit & Light Company, where he remained one year when unfavorable climatic conditions induced him to return to Oregon.

Obituary

Calvin T. Biddison, vice-president and general superintendent of the McGuire-Cummings Manufacturing Company, died at Miami, Fla., on March 26. Mr. Biddison was born in Rock Island, Ill., in 1859. He became connected with the McGuire-Cummings Company in 1890, his first work being that of constructing electric railway trucks. Later he was made foreman of the machine department and then general superintendent. In March, 1914, he was appointed vice-president and general superintendent of the company.

Henry E. Reynolds, assistant general manager of the Bay State Street Railway, Boston, Mass., died suddenly from heart failure at his home in Braintree on March 31. The news of his death was a great shock to electric railway men throughout New England, where Mr. Reynolds was held in the highest esteem. He was born at Randolph, Mass., in 1867, and was educated at Randolph and at Farmington, Me. In 1886 he entered the street railway field as a conductor on the Brockton (Mass.) Street Railway, and became bookkeeper, treasurer and director. Upon the consolidation of the company with what is now the Bay State Street Railway, Mr. Reynolds was appointed superintendent of the Brockton, Quincy and Hyde Park divisions. In 1904 he was made purchasing agent of the Bay State system and became assistant general manager in 1905. Mr. Reynolds was a former vice-president of the New England Street Railway Club, a member of the Massachusetts Street Railway Association, the Engineers' Club of Boston, the American Electric Railway Transportation & Traffic Association, which he served on the electric express and freight committee, and other organizations. The electric express business of the Bay State company has been developed under Mr. Reynolds's personal supervision, and he was intimately associated with the management of the passenger department and with labor matters. He also served as a member of the arbitration board in the Bay State and Middlesex & Boston proceedings a few years ago. He was noted for his modesty and quiet efficiency. Subordinate employees, members of labor organizations, newspaper men and many others held Mr. Reynolds in high regard. During the services attending the funeral the cars on the entire Bay State system were stopped for two minutes, except where such cars were on the track of the Boston Elevated Railway.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Interstate Railway Supply Company, Washington, D. C.**—Incorporated to construct and operate railways and to manufacture supplies for same. Capital stock, $500,000. Incorporators: George C. Havenner, C. L. Bowman, Washington, D. C., and Charles G. Guyer, Wilmington, Del.

FRANCHISES

***Globe, Ariz.**—E. Sultan has received a franchise from the City Council of Globe to construct a line on Broad Street. Plans are being made to build a line between Globe and Miami.

Fullerton, Cal.—The ordinance mentioned in the issue of this paper for Feb. 10 providing for a franchise for the Pacific Electric Railway is not an indeterminate franchise but a direct grant for fifty years to maintain and operate a railroad to be used for transportation of passengers, freight, United States mail, baggage and express matter. No plan has yet been made to extend the line beyond Fullerton.

New Britain, Conn.—The New Britain, Kensington & Meriden Railway has received a two years' extension of time on its franchise to complete the construction of its line between Meriden and New Britain.

Quincy, Ill.—The Quincy Railway has received permission from the City Council of Quincy to construct loops at the termini of the Depot and the Broadway lines.

Wichita, Kan.—The Arkansas Valley Interurban Railway has asked the City Council of Wichita for a franchise to construct a line on Nineteenth Street.

Hattiesburg, Miss.—The Hattiesburg Traction Company has received a franchise from the City Council for lighting the streets of Hattiesburg.

Elmira, N. Y.—The Elmira Water, Light & Railroad Company has received a franchise from the City Council to construct an extension on West Thurston Street, from College Avenue through to the point where tracks are already in use.

Youngstown, Ohio.—The Mahoning Valley Railway has received a franchise from the City Council to construct an extension of its Mahoning Avenue line to Perkins Corners.

TRACK AND ROADWAY

Pacific Electric Railway, Los Angeles, Cal.—Work will soon be begun by the Pacific Electric Railway eliminating grade crossings at Rose Hill, within the city limits, on its Pasadena line, which will cost approximately $300,000, including right-of-way. About 1 mile of its four-track line will be moved up the hill and overhead crossings will be constructed at Mission Road, Turquoise, Topaz, Tourmaline and Herriman streets. The company recently informed the City Council that right-of-way had been secured and that it would soon be ready to proceed under the plan outlined above. The plan for an elevated track by means of a solid fill, proposed last year by the Board of Public Utilities, has been abandoned.

Export Railway, Tampa, Fla.—A contract has been awarded by the Export Railway to E. W. Parker, Tampa, for the construction of 9 miles of line from phosphate mines to Hillsborough Bay, 6 miles south of Tampa, and a 6-mile extension to South Tampa. H. L. Pierce, Tampa, president. [May 27, '16.]

Chicago, North Shore & Milwaukee Electric Railroad, Highwood, Ill.—Officials of the Chicago, North Shore & Milwaukee Electric Railroad have announced that work of building extensions to its lines in Waukegan, and the general improvement of the holdings of the company in that city would begin as soon as the weather permits. The construction of a line to the tannery via North and Glen Flora Avenues will be the first extension. The company intends to carry out this improvement as soon as the materials can be placed on the ground and the work is under way. The other extensions will follow in the summer, it is stated. The company plans to rehabilitate its present lines by replacing the rails or ties and parts of the overhead system where necessary.

Murphysboro & Southern Illinois Railway, Murphysboro, Ill.—This company's line between Murphysboro and Carbondale will be placed in operation about June 1. [Dec. 30, '16.]

Union Traction Company of Indiana, Anderson, Ind.—This company will install a block signal system between Jonesboro and Summitville.

***Ashland, Ky.**—Citizens of this community have accepted the proposal of J. C. Vaughan of Richmond, Va., to raise $50,000 against his $100,000, with which to build an electric railway connecting Ashland and Russell, 5 miles. The plan is to construct the line this summer.

Worcester (Mass.) Consolidated Street Railway.—Work will be begun late this spring or in the early summer by the Worcester Consolidated Street Railway on the reconstruction of its tracks and the installation of new feed wires on Front Street from Main Street to Harding Street, at a cost of about $30,000.

Kansas City (Mo.) Railways.—Bids are being received by the Kansas City Railways until April 10 for track extensions and connecting links, ten pieces of track to be built, ranging from a few blocks to more than a mile.

Brooklyn (N. Y.) Rapid Transit Company.—The Public Service Commission for the First District of New York has approved an agreement between several of the constituent companies of the Brooklyn Rapid Transit System by which, if the Board of Estimate and Apportionment grants the necessary franchises, a new trolley line will be built through Eighty-sixth Street from Fifth Avenue to Third Avenue, Brooklyn, passing through the Eighty-sixth Street terminal station on the Fourth Avenue subway. Under the terms of the dual system contracts transfers are to be exchanged between the trolley cars operating over these lines and the Fourth Avenue subway.

Elmira Water, Light & Railroad Company, Elmira, N. Y.—This company proposes to construct double tracks on Lake Street from Market Street to Water Street and on Water Street from Lake Street to Main Street. It is expected that the work will cost about $40,000.

Hudson & Manhattan Railroad, New York, N. Y.—A bill has been signed by the Governor of New Jersey authorizing the city of Newark to grant a franchise to the Hudson & Manhattan Railroad to construct an extension of its line from Military Park to the terminal building of the Public Service Company.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has awarded two contracts for portions of special work for use on new rapid-transit lines. Both are contracts for frogs and switches and are for use on the Eastern Parkway subway in Brooklyn. One award was made to the Bethlehem Steel Products Company, New York City, the low bidder, at $34,136. The second award was made to William Wharton, Jr., & Company, Inc., New York City, whose contract price was $37,205. The commission also has under consideration another bid for special work for use on the Livonia Avenue line in Brooklyn, the Jerome Avenue line in the Bronx, and the Broadway line in Manhattan. Bids were recently received for this work, the low bidder being the Ramapo Iron Works, New York City, at $28,170.

New York State Railways, Syracuse, N. Y.—Construction and improvement work and additions to equipment, estimated to cost more than $500,000, are planned for this year by the New York State Railways on its Syracuse lines. In all, 5070 ft. of additional track will be laid and track replacement work will aggregate nearly 3 miles. A block signal system will be installed on the East Syracuse line at an estimated cost of $2,270. Extensive improvements to the property in Utica and vicinity during the coming summer is also planned by the company, amounting to about $150,000.

Cleveland, Ohio.—Arrangements are practically completed for the financing of a new car line which will extend from the West Twenty-fifth Street carhouse along Pearl Road to Ridge Road, about 1¾ miles. An agreement has been made whereby the Cleveland Railway will build the line and the $24,800 that has been guaranteed by residents in the section to be benefited by the street cars will be turned over to Commissioner Fielder Sanders for operating expenses.

Columbus Railway, Power & Light Company, Columbus, Ohio.—Harold W. Clapp, superintendent of the Columbus Railway, Power & Light Company, has informed the City Council that it now appears impossible to secure rails for rebuilding the track on North High Street before the fall of 1918.

***Holloway, Ohio.**—Plans are being considered for the construction of an electric railway in Harrison County from a point below Holloway to Jockey Hollow field, near Moorefield. J. A. Bell, Oliver Building, Pittsburgh, is reported interested.

Oklahoma & Northern Traction Company, Bartlesville, Okla.—Edmund F. Saxton, consulting engineer, Philadelphia, representing Eastern bankers, was at Miami recently and inspected the proposed line to Columbus, Kan., and Baxter Springs, Kan., with a view of recommending the construction of the road at an early date. [March 31, '17.]

***Claremore, Okla.**—It is reported that the Claremore Commercial Club plans to construct an electric railway from Skiatook to Pryor, via Collinsville and Claremore, about 40 miles.

Oklahoma Union Railway, Tulsa, Okla.—The Interurban Construction Company, Tulsa, has the contract for the construction of this company's proposed line from Tulsa to Sapulpa, 15 miles.

Brantford (Ont.) Municipal Railway.—A report from the Brantford Municipal Railway states that, owing to the impossibility of securing rails and labor, the 2-mile extension proposed will not be built during 1917.

Portland Railway, Light & Power Company, Portland, Ore.—City Attorney La Roche, of Portland, Ore., states that the Portland Railway, Light & Power Company must secure a permit from the Council before it can proceed with the construction of its proposed loop on Yamhill Street, between Second and First Streets. The company took the stand that as it has an old franchise for the loop, it could proceed without any permit. The proposal to route many of the cars crossing the Hawthorne Avenue Bridge over the proposed Yamhill loop, instead of running them over the Alder Street loop, is being fought by many of the patrons of the company, and the property owners on First and Second and intersecting streets north of Morrison.

Southern Pennsylvania Traction Company, Chester, Pa.—This company will reconstruct its track between Darby and Eddystone, 5½ miles.

Phoenixville, Valley Forge & Strafford Electric Railway, Phoenixville, Pa.—A new bridge will be erected jointly by the county and the Phoenixville, Valley Forge & Strafford Electric Railway over Perkiomen Creek.

Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa.—It is reported that this company may construct an extension from New Castle to Sharon.

Reading Transit & Light Company, Reading, Pa.—This company will spend $150,000 in track-laying and other improvements during this year. The Womelsdorf line will be reballasted from Wyomissing to Womelsdorf.

Saskatoon (Sask.) Municipal Railway.—The City Council of Saskatoon has authorized the expenditure of $19,640 for street railway extensions and equipment.

Bristol (Tenn.) Traction Company.—Operation on the Virginia branch of the Bristol Traction Company has been suspended indefinitely. It is stated that insufficient funds to meet running expenses is responsible for the abandonment of the line.

Chattanooga (Tenn.) Traction Company.—Operation has been begun by the Chattanooga Traction Company of its new interurban lines to Red Bank, through Dry Valley.

Jackson Railway & Light Company, Jackson, Tenn.—Work has been begun by the Jackson Railway & Light Company on double-tracking Main Street from Royal to Market Street.

Tacoma Railway & Power Company, Tacoma, Wash.—Commissioner Gronen of the City Council, who is working with City Engineer Nicholson and Superintendent G. W. Rounds of the Tacoma Railway & Power Company on the proposed extension to the present municipal street railway across the tideflats to the Todd shipbuilding plant outside the city limits, states a double-track extension will be needed. It is estimated this will cost $75,000 more than the preliminary estimate. At this time the city of Tacoma is negotiating with the officials of the Tacoma Railway & Power Company regarding the construction and operation of the line similar to the way the present line, owned by the city, was constructed and is being operated.

Milwaukee Western Railway, Milwaukee, Wis.—Construction will soon be begun by this company on the first section of its proposed line from Milwaukee to Fox Lake. A. B. Keltzsch, Milwaukee, is interested. [Jan. 27, '17.]

SHOPS AND BUILDINGS

Southern Pacific Company, San Francisco, Cal.—Plans have been completed by the Southern Pacific Company for the construction of carhouse No. 3 at Sacramento, which was damaged by fire last fall.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.—It is reported that this company plans to construct a new freight and passenger station at Decatur.

Hagerstown & Frederick Railway, Hagerstown, Md.—This company will erect a fireproof concrete carhouse to replace the structure recently destroyed by fire.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the First District of New York is advertising for bids to be received on April 18 for the construction of station finish for the three stations on that portion of the Park Place, William and Clark Street subway in Manhattan. An effort will be made to push both the station finish and track-laying work on this line to early completion in order to make it possible to operate as far as the Wall Street station during the coming autumn. Three stations are involved in the contract, namely, those at Wall and William Streets, Fulton and William Streets, and Park Place and Broadway. The Park Place, William and Clark Street subway will furnish a connection between the west trunk subway in Manhattan, consisting of the Seventh Avenue subway and the upper portion of the first subway, for operation by the Interborough Rapid Transit Company, and the first subway in Brooklyn. This link will connect with the Seventh Avenue subway at Park Place and West Broadway in Manhattan, and with the first subway at Fulton and Joralemon Streets in Brooklyn.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—This company plans to construct a new passenger and freight station at Dunkirk to cost $15,000, a new carhouse at Fredonia to cost approximately $20,000, a new passenger and freight station at Brockton to cost $7,500 and a new passenger and freight station at Westfield to cost $7,500.

POWER HOUSES AND SUBSTATIONS

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me.—This company plans to expend about $200,000 this year for additional power facilities.

Eastern Wisconsin Electric Company, Sheboygan, Wis.—Plans will soon be completed by the Eastern Wisconsin Electric Company for the construction of a new power house of 5000 or 6000-kw. capacity at Sheboygan. This plant will be connected with the Fond du Lac and Oshkosh properties of the company by a transmission line.

West Virginia Traction & Electric Company, Morgantown, W. Va.—The Morgantown division of this company will erect a 13,000-volt cross-country transmission line to supply power for coal mining.

Wisconsin Traction, Light, Heat & Power Company, Appleton, Wis.—A contract has been awarded by this company to the Blake Construction Company, Appleton, for the construction of a substation at Neenah.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Shall the Purchasing Agents and Storekeepers Organize?

An Association for Individual and Company Benefit Suggested—Several Purchasing Agents Discuss Need for Co-operation

The possibilities and probable value of an association of electric railway purchasing agents and storekeepers has recently been discussed by representatives of a number of roads. The ELECTRIC RAILWAY JOURNAL was urged by a purchasing agent to raise the question, "Shall the electric railway purchasing agents and storekeepers have an association?"

This purchasing agent who represents a large company in the Mississippi Valley, wrote as follows:

"I have often wondered why the purchasing agents and storekeepers of the electric lines have not an organization with regular meetings, the same as have the operating officials. Or, why can they not have an organization somewhat similar to that of the steam railroad storekeepers? I may be mistaken, but I believe it is just as much an advantage to the purchasing agents to know who has and who sells certain articles as it is to the salesman to know who will buy his products. In other words, I am anxious to buy for my company the right thing at the right price, and I seek the seller of that thing as earnestly as he seeks me. I believe the purchasing agents and storekeepers could profitably organize to discuss problems not only relating to purchasing ideas and methods, but also to such parts of the work as the issuance, care, handling and accounting for materials. I wonder if there are enough others of the same mind to warrant taking definite steps to organize an electric railway purchasing agents' association?"

The ELECTRIC RAILWAY JOURNAL, in its endeavor to serve the industry and in its belief that there was need for a common meeting ground for the discussion of purchasing and manufacturing subjects, a few months ago inaugurated this department "Manufactures and Markets." The reception of the new department has confirmed the thought that there are many subjects of common interest suitable for joint discussion by purchasing agents and purchasing engineers in different parts of the country and on various kinds of electric railways.

ORGANIZATION EARLIER CONSIDERED

A few years ago several purchasing agents, whose companies were members of the American Electric Railway Association, met and proposed the organization of a purchasing agents' association which would be affiliated with the American Electric Railway Association. Then the officers of the American Association held the opinion that the purchasing agents could properly affiliate with the engineering association. In consequence, a committee of four, directed by the president of the Engineering Association to investigate and report on the best method of handling the membership of purchasing agents and storekeepers in that association, recommended that the activities of the purchasing agents so far as organization was concerned should be confined to committee work in the Engineering Association. With this recommendation the purchasing agents, who had until then promoted the idea, did not entirely agree and nothing has since been done in the way of effecting an association or a committee.

The letter earlier presented and letters from other railway purchaing agents presented herewith indicate the desire of the purchasing agents and storekeepers for a separate organization. The question of whether that organization should be affiliated with the American Electric Railway Association, should be a committee of the American Electric Railway Engineering Association, or should be an independent association, is not now under discussion. The following views on the general subject will be found of interest as expressing the ideas of representative men.

George G. Kuhn, purchasing agent, the Tri-City Railway Company, Davenport, Iowa, is of the opinion that some effort should be made to form a purchasing agents' association. He writes that the benefits to be derived from such an association would certainly be worth the effort.

R. R. Smith, purchasing agent, Terre Haute, Indianapolis & Eastern Traction Co., Indianapolis, thinks that "an association would undoubtedly do good in the way of standardizing methods of handling materials and accounting for them. An exchange of opinions cannot fail to bring out points of practical value to the companies."

CO-OPERATION IS A STIMULUS

One of the first buyers in the electric railway industry to advance the idea of purchasing agents and storekeepers forming an association of their own was W. H. Smaw, purchasing agent Georgia Railway & Power Company, Atlanta, Ga. He is very firm in his belief that such an organization would be of great value. In discussing this question he writes: "Co-operation is a stimulus to any business, and I should think that an association of buyers, in which we could get together once in a while and discuss ways and means, would add new life to and perhaps increase the little pleasure that we get out of our occupation. Within the past few years considerable attention has been given to the buyer and to his department. Several books have been published on the subject. There is now published a monthly journal in the interest of purchasing. There is also the National Association of Purchasing Agents, with branches in all large cities, and 'big business' is giving more attention to the purchasing branch of its organizations than ever before, having just begun to realize its great importance. I firmly believe that an organization of purchasing agents in the electrical industry would not only benefit the buyer but the 'boss' as well."

SHOULD INCLUDE THE STOREKEEPERS

The Transit Supply Company of St. Paul, Minn., handles the purchases and material distribution for the large property in St. Paul and Minneapolis and surrounding territory, known as the Twin City Rapid Transit Company. W. Whitford, purchasing agent, recently expressed the opinion that a purchasing agents' and storekeepers' association in the electric railway industry would be beneficial to every purchasing agent in the country. He said, "these men should know more about the methods of each other. The engineers and other department heads get together and swap ideas which in a great many instances are greatly beneficial not only to the engineers as individuals but to the company by which they are employed. I believe that such an organization if started would be still better if it was a joint purchasing agents' and storekeepers' association. Both of the positions mentioned have a great many things in common and lack of co-operation between the two results in things happening that are not for the best interests of the companies.

"At the present time manufacturers and their sales agents have organizations to assist each other in disposing of their products to the best advantage. Personally, I do not see how a number of men working individually can successfully look after their interests with any great degree of success without their own organization.

"There is a whole lot that could be said in favor of such an association and possibly some things that would not be so favorable, but I think the favorable ones more than offset the others."

In discussing the question of whether or not a purchasing agents' and storekeepers' association could profitably be organized in the electric railway industry, E. E. Kretschmer, purchasing agent, Chicago Elevated Railways, held a view that such an organization would be a good thing if the different members could be brought together, and that, he thought, would be the deciding factor. Mr. Kretschmer pointed out the successes of the purchasing agents' associations in other lines of industry, including the steam railway field. He further said, "I have been a member of the Railway Storekeepers' Association for a number of years, and I believe it one of the best things I ever did when I joined. I have attended their last four or five conventions and have been well repaid each time. In fact, our own storekeeping system has been built up on the general lines recommended by the Storekeepers' Association with certain modifications to suit local conditions. Personally, I believe the electric railways could get more out of an association of purchasing agents and storekeepers if it were affiliated with the American Electric Railway Association, and I believe that there would be more action if it operated independently of the Engineering Association."

The different purchasing agents who have discussed this subject confirm the statement that there is little doubt but if an organization should be effected, its members, as well as the companies they represent, would be greatly benefited.

Home-Made Special Work on the Increase

Way Engineer Explains Present Tendency of Railways in This Respect—Arc Welding Equipment Effects Big Saving

According to the way engineer of a large Eastern street railway, the city railway companies have not purchased for renewal purposes during the past four or five years anywhere near as much special track work as they did previous to that time. One reason for this has been the wide-spread use of arc welders by which the necessity for scrapping worn pieces of special work can be postponed for years. More stable crossing foundations also have increased the life of track special work. Still another reason for fewer orders is the present high cost of new special work. Thus the arc welder has been employed extensively, not only for its intrinsic merits but also for the chance it afforded to the electric railway company to become independent of the special work manufacturer.

Of course, special track work cannot be kept in good condition permanently by maintenance only. After a certain period in its life renewal becomes cheaper, although better installation methods, better materials and the use of the arc welder help to postpone that day. There is also no doubt that considerable track special work throughout the country is approaching this time, owing to the small number of renewals made during the past five years on electric railways.

The extraordinary high prices for track special work did not come until 1915, and even with the very high prices of 1916 it is said that twice as much special work was purchased in 1916 as in 1915. The depression in electric railway receipts in 1912, 1913 and 1914 really prohibited the making of the normal purchases during those years. Thus any statement now that the special work orders are numerous must be considered in the light of the abnormally small amounts sold during the jitney period of 1914 to 1915.

On some properties, even including those with dense traffic and heavy cars, there is a growing tendency for the use of home-made bolted crossings on the theory that they are more frequently repaired and replaced than heavy iron-bound manganese steel pieces. A larger number of electric roads also are installing shop facilities for the manufacture of more durable special work. On his own property, for instance, the speaker quoted in the earlier part of this article said that his company was making all of the manganese special work which it could, and as its present shop is too small to meet all demands, he has asked for an enlarged shop which will be able to supply all of the material of this kind which the road may need.

Standard Sizes for Catalogs

BY W. R. HULBERT

Sales Manager Goldschmidt Thermit Company, New York, N. Y.

I have read with much interest Mr. Chandler's article on page 372 of the Feb. 24 issue on the subject of uniform catalog sizes.

It has been our endeavor to conform to the following standard sizes for catalogs and booklets: Small booklets, 6 in. x 3 in.; larger pamphlets, particularly pamphlets of instruction, 6 in. x 9 in., and for our quarterly publication, *Reactions*, we chose a size of 8⅛ x 10¾ in., as that was practically the size of our standard letter heads and permitted of filing in vertical files if desired. Furthermore, the paper cuts economically to that size. We have also issued a loose-sheet catalog on price lists of parts for our rail grinder, and are getting out another one of a general price list of our other materials which is 6 in. x 9 in. We certainly believe in standard sizes and adhere strictly to those mentioned above in our own publications.

United Gas & Electric to Order Cars

The United Gas & Electric Corporation is sending out specifications for sixty-five cars which will be practically duplicates of the fifty cars built by the Southern Car Company two years ago for its New Orleans properties. These cars were fully described in the ELECTRIC RAILWAY JOURNAL for Feb. 6, 1915. The new cars will differ chiefly in the use of a folding instead of a sliding door on the motorman's side, and in vertical stanchions instead of horizontal grab handles.

The sixty-five cars will be distributed as follows: Six, Little Rock; twelve, Birmingham; twelve, Knoxville; and thirty-five, New Orleans. It is possible that the number for New Orleans may be increased later. It is worthy of note that the decision to use the same car for these cities, and later for Memphis, was reached after the equipment and transportation superintendents of these properties had spent several days during March in studying the New Orleans car from every angle. This type had proved so satisfactory that all agreed it ought to be made standard for the Southern properties.

Gear Manufacturers Organize

An organization of gear manufacturers, which will be known as the American Gear Manufacturers' Association and whose purposes are to advance and improve the gear industry by standardization of gear design, manufacture and application, was formed at Lakewood, N. J., March 25 to 27. The executive committee is composed of the following: F. W. Sinram, Van Dorn & Dutton Company, Cleveland, Ohio; H. E. Eberhardt, Newark (N. J.) Gear Cutting Machine Company; F. D. Hamlin, Earle Gear & Machine Company, Philadelphia, Pa.; Frank Horsburgh, Horsburgh & Scott, Cleveland, Ohio; Biddle Arthur, Simonds Manufacturing Company, Pittsburgh, Pa.; George L. Markland, Philadelphia Gear Works, Philadelphia, Pa., and Milton Rupert, R. D. Nuttall Company, Pittsburgh, Pa. The officers elected at the Lakewood meeting are: F. W. Sinram, president; H. E. Eberhardt, vice-president; F. D. Hamlin, secretary, and Frank Horsburgh, treasurer. The next meeting of the association will be held at Pittsburgh, May 14 and 15.

Reasons for Ordering Cars Now

On being asked why his company was ordering a large number of cars at this time with materials so high, the head of a large syndicate said: "We believe it good business to anticipate our car needs now, despite the high prices of material and labor. We know that the premium on those items cannot be avoided, but we also feel sure that the car builders are so keen for business that they will give us the lowest possible prices and good delivery. Those who hold off ordering cars until next year will find labor and material conditions still worse and crowded car shops to boot."

Cars Tied Up in Embargoes

Reports just received by the commission on car service of the American Railway Association show that on March 10 (the latest date for which data have been compiled), 16,998 cars loaded with freight were being held at various points in the country because of so-called embargoes. This is a reduction of 50 per cent since Feb. 17, when 33,540 cars were being held for this reason. The largest number of cars, 6037, are being held by the Eastern railroads, while the others are scattered throughout the United States. A very large proportion, however, nearly two-thirds, is east of the Mississippi River.

Recorders for Kansas City Railways

The Kansas City Railways has purchased 750 Rico coasting recorders, 650 to be delivered by June 1, and the others shortly afterward. All cars are to be equipped. It is said that a saving of about 15 per cent in power consumption is expected from the devices, which will be an important factor in view of the heavy load now on the plants. The Kansas City Light & Power Company, which now gets most of its power from the railways, is adding to its own producing equipment, and will shortly erect a large plant; the 15 per cent saving will, it is reported, materially aid in tiding over the railways company until the light company can take care of itself.

Scarcity of Shop Labor

Just to show that the question of labor scarcity and high cost is not confined to the manufacturing side of the electric railway industry, the master mechanic of a large road in the North Central States recently pointed out in discussion that on his property during the last year the labor change in the mechanical departments had totaled 300 per cent. About 100 men are employed regularly, and during the year 300 new men were hired in order to keep the staff at its normal size. "We raised the wages several times," he said, "in order to hold the old-time experienced mechanics, but were unsuccessful in many instances."

CURRENT PRICES FOR MATERIALS

Quoted Apr. 5

Copper (electrolytic)	New York, 34 cents per pound
Rubber-covered wire (base)	New York, 42 cents per pound
No. 0000 feeder cable (bare)	New York, 42 cents per pound
No. 0000 feeder cable (stranded)	New York, 39¾ cents per pound
No. 6 copper wire (insulated)	New York, 37½ cents per pound
No. 6 copper wire (bare)	New York, 42 cents per pound
Tin (straits)	New York, 54¼ cents per pound
Lead	New York, 9⅜ cents per pound
Spelter	New York, 10¾ cents per pound
Rails, A. S. C. E., O. H.	Mill, $40 per gross ton
Rails, A. S. C. E., Bess	Mill, $38 per gross ton
Wire nails	Pittsburgh, $3.20 per 100 pounds
Railroad spikes, 9/16 in. and larger	Pittsburgh, 3.65 cents per pound
Steel (bars)	Pittsburgh, 3¾ cents per pound
Sheet iron (black, 24 gage)	Pittsburgh, 5.30 cents per pound
Sheet iron (galv., 24 gage)	Pittsburgh, 6.55 cents per pound
I-beams over 15 in.	Pittsburgh, 10 cents per pound
½-in. galv. extra high strength steel wire	New York, $7.04 per 100 ft.
⅜-in. galv. high strength steel wire	New York, $3.52 per 100 ft.
⅜-in. galv. Siemens-Martin wire	New York, $2.60 per 100 ft.
5/16-in. galv. Siemens-Martin wire	New York, $2.00 per 100 ft.
Galvanized barb wire and staples	Pittsburgh, 4.05 cents per pound
Galvanized wire (ordinary)	Pittsburgh, 3.85 cents per pound
Cement (carload lots) with rebate for sacks	New York, $2.12 per barrel
Cement (carload lots)	Chicago, $2.16 per barrel
Cement (carload lots)	Seattle, $2.60 per barrel
Sand in large lots	New York, 50 cents per ton
Waste, No. 1 white	New York, 14 cents per pound
Linseed oil (raw, 5-bbl. lots)	New York, $1.05 per gallon
Linseed oil (boiled, 5-bbl. lots)	New York, $1.06 per gallon
White lead (100-lb. keg)	New York, 10¼ cents per pound
Turpentine (bbbl. lots)	New York, 48 cents per gallon

OLD METAL PRICES

Copper (heavy)	New York, 29 cents per pound
Copper (light)	New York, 24¾ cents per pound
Red brass	New York, 20 cents per pound
Yellow brass	New York, 19 cents per pound
Lead	New York, 8 cents per pound
Zinc	8 cents per pound
Steel car axles	Chicago, $38 per net ton
Iron car wheels	Chicago, $22.50 per gross ton
Steel rail (scrap)	Chicago, $28.50 per gross ton
Steel rail (relaying)	Chicago, $34 per gross ton
Machine shop turnings	Chicago, $9.50 per net ton

ROLLING STOCK

Denver (Col.) Tramways are reported to be considering the purchase of additional equipment.

Cincinnati & Columbus Traction Company, Norwood, Ohio, is in the market for one motor-equipped box car for freight service.

Omaha & Council Bluffs Street Railway, Omaha, Neb., is reported to be building forty new semi-steel cars in its Lake Street car shops. The cars will cost in the neighborhood of $300,000.

Toledo, Bowling Green & Southern Traction Company, Toledo, Ohio, has ordered four cars from the Cincinnati Car Company.

Nipissing Central Railway, North Cobalt, Ont., Canada, in a recent fire had its carhouse damaged to the extent of about $40,000. The loss to electrical equipment was about $30,000 and to cars about $60,000.

Montreal Tramways, Montreal, Que., Canada, noted in the March 10 issue as being in the market for fifty cars in addition to the fifty previously reported, has placed this order with the J. F. Brill Company. The details of equipment of all the cars ordered are as follows:

Number of cars ordered	100
Delivery	Five to six months
Builder	Brill
Type	50 Motor, 50 Trail
Capacity	Motor, 42; Trail 45
Weight (total):	
Motor	43,800 lb.
Trail	36,470 lb.
Bolster centers:	
Motor	21 ft. 0 in.
Trail	21 ft. 0 in.
Length over bumpers:	
Motor	45 ft. 3 in.
Trail	44 ft. 3 in.
Length over vestibule:	
Motor	44 ft. 3 in.
Trail	43 ft. 3 in.
Width over all	8 ft. 5 in.
Rail to trolley base	11 ft. 4½ in.
Body	Steel—Wood Posts
Interior trim	Cherry
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse
Axles	Brill
Bumpers	Brill
Car trimmings	Brill
Control	West. P.K. Multiple Unit
Couplers	Tomlinson
Curtain fixtures	National
Curtain material	Pantasote
Designation signs	Keystone

Fare boxes	Coleman stationary
Fenders or wheelguards	H.B.
Gears and pinions	Nuttall BP
Hand brakes	Brill
Heaters	Consolidated Car
Journal boxes	Brill
Lightning arresters	Westinghouse
Motors, West 533-T-4	4 Motor car 2 Trail car
Motors	Outside hung
Paint	Varnish
Registers	None
Sanders	Brill
Sash fixtures	National
Seats, style	Brill
Seating material	Rattan
Springs	Brill
Step treads	Lead & Stanwood
Trolley retrievers	Keystone
Trolley base	U. S. A. No. 11
Trolley wheels	Ideal
Trucks, type	Brill 76-E
Ventilators	Perry
Wheels	Ry. standard C.I. 30-in.
Special devices, etc.	Railway Utility Heat Regulators. Door signal interlocked with control circuit. 94-watt. lamps with reflectors and automatic compensating device for burned-out lamps.

San Francisco-Oakland Terminal Railways, Oakland, Cal., noted in the ELECTRIC RAILWAY JOURNAL of Dec. 30, 1916, page 1365, as petitioning the California Railroad Commission for authority to issue $180,000 of equipment notes, to secure funds to pay in part for thirty-two new cars, has specified the following details for these cars which are being built by the American Car Company, St. Louis, Mo. Twenty of the cars will be used for express service between Oakland and Berkeley, while the twelve remaining cars will be placed in service on the Twelfth Street line. These twelve cars are 51 ft. 4 in. long, 9 ft. ½ in. wide and seat 60 passengers. The other details are practically the same as for the twenty cars and are as follows:

Number	32
Builder	American Car
Type	Center entrance P. A. Y. E.
Seating capacity	52
Bolster centers	23 ft. 6 in.
Length over bumpers	40 ft. 7¾ in.
Length over vestibule	39 ft. 7¾ in.
Width over all	8 ft. 8 in.
Rail to trolley base	11 ft. 2⅞ in.
Body	Semi-steel
Interior trim	Polished bronze
Headlining	Agasote
Roof	Monitor
Air brakes	G. E. and West.
Axles	Brill
Bumpers	American Car
Car trimmings	Brill
Control	Type K-35, G2 and M
Couplers	American Car Pull Bar and Tomlinson MCB Radial
Curtain fixtures	Nat'l Lock Washer
Curtain material	Pantasote
Curtain rollers	Curtain Supply
Designation signs	Hunter Ill.
Fenders	Eclipse Type C and American Car Steel Pilot

Gears and pinions	Gen. Electric
Hand brakes	American Car
Headlights	Golden Glow and GE.
Journal boxes	Brill
Lightning arresters	Gen. Electric
Motors	4 GE. 247-A per car and 2 GE. 240 per car
Paint	Sherwin-Williams and St. Louis Surface & Paint Company, Lowe Bros.
Registers	Ohmer
Sanders	Nichols-Lintern
Sash fixtures	Brill
Seats, type	Brill reversible
Seating material	Rattan
Springs	Brill
Step treads	Feralun
Trolley base	U. S. No. 13-D
Trolley wheels or shoes	General Electric
Trucks, type	Brill 77-E-1 and St. Louis Car 23-B
Ventilators	12 deck sash each side
Wheels	F.C.S. 24 in. and rolled steel 34 in.
Special devices	Brill Renitent post casings

Cleveland (Ohio) Railway is reported to be considering the purchase of 100 motor and 100 trail cars.

Pittsburgh (Pa.) Railways are reported to be asking for bids on 100 trail cars.

TRADE NOTES

Bound Brook (N. J.) Oil-Less Bearing Company announces that Dean C. Jenkins has been made assistant to the production manager. E. L. Evans has been appointed chief inspector to fill the vacancy made by Mr. Jenkins.

National Railway Appliance Company, New York, N. Y., succeeding the U. S. Metal & Manufacturing Company in its railroad department business, announces its removal to 50 East Forty-second Street.

F. M. Freeburg, Philadelphia, Pa., reports that the operation of the Freeburg switch installed by the Philadelphia Rapid Transit Company on Oct. 17, 1916, for test purposes has been satisfactory in every particular according to the reportof J. C. Luger, superintendent of the company.

United States Electric Signal Company, West Newton, Mass., has just received an order from the Caiptal Traction Company for the tower control interlocking equipment for the control of the switches on the new track layout at Fifteenth Street and New York Avenue, Washington, D. C. The standard American type 7 switch-throwing mechanisms are to be used for the control of the switch points.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., held its seventh annual dinner on March 24 at the Fort Pitt Hotel. Nearly 500 employees attended the dinner which was given under the auspices of the Westinghouse Club. The principal speakers were H. D. Shute, and E. M. Herr of the Westinghouse Company, and Farley M. Osgood of the Public Service Electric Company, Newark, N. J.

Bradford-Ackermann Corporation, New York, N. Y., recently formed by A. H. Ackerman and C. C. Bradford, with offices in the Forty-second Street Building, announce that they have concluded arrangements with Ashton, Laird & Company for the exclusive selling rights of their Astra high-temperature gas apparatus and oxygen welding appliances. In addition to the above, a new and standardized line of oxy-illuminating gas apparatus exclusively manufactured by this company will be marketed.

Railway Improvement Company, New York, N. Y., announces that it has received orders for anti-climbers to be used on fifteen cars of the Peoria Railway, on fifty cars being built by G. C. Kuhlman for the International Railway, Buffalo, and for twelve cars being built by J. G. Brill for the Easton Transit Company. An order has also been received for 2800 sanitary straps to be used on the fifty cars of the Public Service Railway recently ordered from the Cincinnati Car Company.

Harrison Brothers & Company, Inc., Philadelphia, Pa., at a recent meeting of the stockholders, voted to accept the offer of $5,700,000 cash made by the DuPont Company of Wilmington, Del., for the business, holdings, etc., of the company. Hereafter the business will be conducted by a new Pennsylvania corporation to be known as Harrisons, Inc., a charter for which has been applied for. The incorporators are Lammot DuPont, Dr. Charles L. Reese and Charles A. Meade of the DuPont Company; A. R. Glancy and William Richter, secretary of the Harrison Company.

ADVERTISING LITERATURE

Ohmer Fare Register Company, Dayton, Ohio, has issued a booklet, "A Pointer on Economy."

Detroit Stoker Company, Detroit, Mich., has issued a catalog on the Detroit V-type side-feed stokers.

Northern White Cedar Association, Minneapolis, Minn., has issued a booklet on "How to Build a Good Fence."

American Railways Equipment Company, Dayton, Ohio, has issued a bulletin on the American coin-ticket fare box for safeguarding prepayment fare collections.

General Electric Company has issued Bulletin No. 40400A on its form PB belt-driven alternators. They are built in sizes from 30 kw. to 240 kw. and are designed for both power and lighting service.

Spray Engineering Company, Boston, Mass., is distributing bulletin No. 501, which is a condensed summarization of the principal developments in this company's products.

Electric Service Supplies Company, Philadelphia, Pa., is distributing a supplement showing new and improved devices and revised listings relating to material covered by general catalog No. 4, Vol. 2, on car equipment and supplies.

National Tube Company, Pittsburgh, Pa., is distributing a reprint of a paper on the prevention of corrosion in pipes which was recently presented before the American Society of Heating and Ventilating Engineering by F. N. Speller, metallurgical engineer of the company.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued special publication 1572 on protective relays and their use on alternating-current systems. This booklet shows how interruptions to service can be prevented by the use of Westinghouse protective relays for automatically sectionalizing the lines. Methods of sectionalizing systems consisting of radial feeders, loops, parallel feeders and networks are described and illustrated.

New Publications

Government Partnership in Railroads. By Mark Wymond. Wymond & Clark, 909 Rand McNally Building, Chicago, Ill. 192 pages. Buckram, $1.50.

This book is devoted to a discussion of the transportation problem. It outlines with equal frankness the sins of regulation and the sins of steam railroads, and proposes a constructive policy having as its characteristics such features as one regulatory body with district divisions, governmental guarantee of interest and profit-sharing with the public. Government ownership is discussed as the alternative, although the author does not believe in the probability of the nation arriving at the conclusion that a paternal policy is better than one based on individual initiative. The work on the whole seems an earnest, common-sense attempt at constructive criticism of the existing steam railroad situation.

Valuation, Depreciation and the Rate Base. By C. E. Grunsky and C. E. Grunsky, Jr. John Wiley & Sons, Inc., New York, N. Y. 387 pages. Cloth, $4, net.

The theoretical part of this book is in the main an amplification of the fundamental idea that there would be great advantage in adopting, instead of "present value," a rate basis without deduction of depreciation, which would include but little, if anything, other than "legitimate and properly estimated cost" as the starting point in fixing rates. On the practical side the book discusses such important questions as the effect of non-agreement between actual and probable life upon the determination of depreciation; it is well fortified with formulæ, figures and even accounting entries, and it also contains valuable tables in regard to interest, annuities, amortization and depreciation. Whether or not the engineer or utility official interested in problems of finance and valuation agree with some of the theoretical ideas advanced by the authors, they will probably find the mathematical and tabular information of considerable value.

Contracts, Specifications and Engineering Relations. By Daniel W. Mead, Professor of Hydraulic and Sanitary Engineering, University of Wisconsin, Madison, Wis. McGraw-Hill Book Company, Inc., New York, N. Y. 518 pages. Cloth, $3 net.

This book is intended to familiarize the engineer or architect with some of his relations in practical life. Not only are personal requirements emphasized, which are necessary in the more successful execution of technical duties, but stress is also laid upon the importance of moral and ethical principles. The author believes that "the best and most successful men in every business and profession are those whose character and reputation are regarded as the greatest and most valuable of their possessions." Considerable space is given to discussion on the preparation of specifications, and samples of contracts and specifications are presented for comparison and study. Full-page drawings, illustrating various structures and mechanisms, are furnished to afford a basis for writing specifications on the different subjects.

Electric Railway Journal

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Consolidation of Street Railway Journal and Electric Railway Review

Vol. XLIX NEW YORK, SATURDAY, APRIL 14, 1917 Number 15

Communication from General Harries

New York, April 12, 1917.

To the Editors:

Please announce in your columns that complete arrangements have now been made by which the Council of National Defense looks to the American Electric Railway Association for all information as to electric carriers. Conferences are being held with the Quartermaster Department of the Army as to tariffs and transportation matters generally. In the interest of efficiency, electric railway companies should address all communications with respect to national defense to E. B. Burritt, secretary American Electric Railway Association.

George H. Harries,
Chairman
Committee on National Defense.

SIX-CENT FARE POSSIBLE FOR PHILADELPHIA

Director Twining, as we noted last week, admits that a 5-cent fare with universal transfers will not meet the demands of such a unified surface and rapid-transit system as has been contemplated for Philadelphia. This being so, two courses are open—to limit the present new construction or to provide for increased revenues. It may be that part of the work now contemplated can easily be postponed, but this does not afford a permanent solution of the problem. Moreover, the modern city needs rapid transit, and the idea of practising self-deprivation along this line in order to maintain a 5-cent fare limit is neither far-sighted nor public-spirited. Philadelphia, as it happens, is in a good position to put a dent in the "sacred" nickel. To take care of all the deficits estimated by the engineers, Ford, Bacon & Davis, only one of two means can be utilized—making a heavy increase in taxation, or charging a rate of fare to cover the cost of service. Under the first method the burden would fall upon the owner or renter of real estate rather than upon the passenger—a condition that would probably be opposed in Philadelphia because of the unusually large number of home owners. Again, owing to a State law any municipal bonds which are self-supporting need not be included in the municipal debt limit. For these reasons the question of an adequate electric railway fare ought to be, and we hope will be, faced squarely in Philadelphia.

HIGHER REVENUES NEEDED

Although overshadowed by the onrush of international events, the question of adequate transportation revenues is to-day of great importance throughout the whole country. The steam railroads, with their expansion limited by economic conditions very similar to those which face the electric railways, are making a concerted effort to secure general increases of from 10 to 15 per cent in freight rates. With higher expenditures for materials, fuel, supplies, taxes and wages, the railroads have in general been placed in the position of having decreasing net receipts with increasing gross business. And it is not to be supposed that this situation will be improved under war conditions. The outlook for real growth, therefore, is dark, unless the carriers are allowed to charge rates sufficient to meet the rising costs of operation. The electric roads are fully as seriously situated, and as they have already proved the necessity of a 6-cent fare under peace conditions, they should certainly be permitted to charge it under war conditions, just as we trust the plea of the steam railroads for higher rates will be granted. The country as never before needs those good transportation facilities which only solvent corporations can supply.

FUEL ECONOMY UNDER ELECTRIC OPERATION

To those who have followed the development of steam railroad electrification since the time when all discussion was based upon pure theory, the data on actual operating results that are now becoming available provide material for many interesting "post mortems." One such case in particular appears in the much-challenged prophecy made some years ago by W. S. Murray to the effect that the ratio of coal consumption by steam locomotives to that of electrically driven equipment would be in the ratio of at least 2:1. This, as we recollect it, was a large mouthful for even the enthusiasts to swallow, yet the figures for the Chicago, Milwaukee & St. Paul's electrified divisions that were published in a recent issue indicate that the statement was really conservative. These records show that in passenger service, 188 lb. of coal were required per train-mile under steam operating conditions as against 29.1 kw.-hr. per train-mile with hydroelectric power. For freight service the corresponding figures are 276 lb. of coal and 39.4 kw.-hr. per 1000 ton-miles. The coal in question is generally lignitic in character, but a somewhat better quality is available over the western part of the electric zone than on the eastern slope of the mountains, the average value approximating 11,000 B.t.u. per pound as burned. Since an over-all twenty-four-hour thermal efficiency of 12 per cent is regularly reached by modern power stations, 1 kw.-hr. in a station using this fuel should require 2.6 lb. of coal. The recorded energy consumptions of 29.1 kw.-hr. per passenger train-mile and 39.4 kw.-hr. per 1000 freight ton-miles then correspond to respectively 75 lb. and 102 lb. of coal under conditions of electrical operation. When compared with the record for coal-consumption under steam, the figures give ratios of 2.5:1 for passenger service and 2.7:1 for freight service, exceeding materially the ratio that was considered too high in the early days of electrification.

GETTING MORE OUT OF THE POWER PLANT

Several of the articles in this issue of the ELECTRIC RAILWAY JOURNAL are devoted to the design and operating problems of the steam power plant, especially to those of the so-called "auxiliaries." The boilers, with their furnaces, the engines or turbines, and the electric generators are the fundamental parts of the plant. Associated with them are numerous devices which contribute largely to making their operation effective. Coincident with the development of the basic equipment has been that of the auxiliaries, so that a modern plant is a great and almost automatic machine for turning the energy of coal into that of the electric current. The labor element has been reduced to very reasonable proportions by the substitution of mechanical devices, and it is a primitive plant indeed in which human labor is employed where much cheaper energy can be used. The present and prospective scarcity and expensiveness of labor furnishes an added incentive for the installation of these devices.

One of the notable results which has followed the use of such apparatus as that for coal and ashes handling, which is described in two articles this week, and of the efficient modern prime movers having great output per ton of weight, has been the bringing nearer together of the cost of coal and of electrical energy. In early plants the fuel item was comparatively small in the list of operating costs. Now it is the dominating element, and its position at the head of the list is firmly established if present coal prices continue. In other words, the cost of transforming energy from one extreme form to the other is becoming relatively very much less than it formerly was due to the mechanical and thermal perfection of the transformations.

This result is remarkable when one considers the complication of these transformations and the many possible sources of loss. To be sure most of the energy still goes out through the condenser circulating water and the chimney rather than the switchboard, but until some new process of getting energy direct from coal is discovered these losses are inevitable. The preventable losses, such as radiation, those due to excess flue temperatures, cylinder condensation and the like have been largely eliminated. In the meantime the men who are "making the wheels go round" should have the support of the management in their endeavor to get every possible kilowatt-hour out of every ton of the precious mineral with which they are feeding the capacious maw of the boiler room.

HOW THE RAILWAYS CAN HELP

Everyone should realize that a country engaged in war is in danger of man famine. With part of the able-bodied population under arms and another large part engaged in the manufacture of military supplies, every effort should be made to utilize the productive labor energies of the nation to their fullest extent. Every man engaged in useless work means fewer at the front, or on the farm, or in munition factories, or in transportation service, or otherwise engaged in the defense of the nation. Just as there must be economy in the consumption of food and in all expenditures of money, so there must be efficiency and economy in the use of labor in all industries.

For electric railways this does not mean a reduction of their transportation service because electric railway transportation has been recognized by the war department as an important factor in its plan for national defense, but it does mean that every company should study how it can make its labor most efficient and how it can relieve for military duty any of its men who may be called to the colors. We have previously referred to the possibility of using women in many places where men are usually now employed, and it is interesting to record that the American Gas & Electric Company has already found that under certain conditions women make good substation attendants. One-man cars, in many cases, also offer an opportunity for retrenchment in our national resources, not only because they will relieve both the man conductor and his woman substitute, but also because they will provide a means by which the companies can reduce expenditures in these serious times.

Several electric railway companies have already announced that the unused land along their rights-of-way and elsewhere will be available for farming this summer. As much of this property is near cities, its cultivation may be of material help in adding to the necessary food supplies. Other companies have already volunteered to the government secret service department the co-operation of the railway's confidential organization. Car conductors are in an excellent position for reporting unusual or suspicious events, and arrangements could well be made for receiving such reports through one man at the head office.

Another suggestion to electric railways, borrowed from experience of both the British and Canadian tramways, is co-operation with the military authorities in recruiting by the operation over the lines in the evening of illuminated cars with bands and recruiting posters. Still another suggestion, also from our British allies, is for the medical and clerical staff of the railway to assist the authorities in the examination and enlistment of recruits. As the physical requirements for employment on most electric railway companies are as high, if not higher, than those of the government for military service, co-operation of this kind should be of value to the present emergency. In some British cities a very considerable part of the military medical examinations were conducted by the tramways.

"TOO MUCH PUBLICITY ABOUT PUBLICITY"?

A correspondent of the ELECTRIC RAILWAY JOURNAL recently asked an officer of an important public utility company to give this publication details of its methods of obtaining publicity. That officer seemed doubtful of the wisdom of saying much, observing, "There is danger of there being too much publicity about publicity." The same idea has been expressed by others. This particular officer seemed to feel that publicity involved personal relations, friendship and other processes which could not be ventilated to advantage. Such an attitude of mind discloses, in our judgment, a fatal misconception of the meaning of publicity. Any plan of attempting to secure publicity, the details of which plan cannot themselves be made fully public, is nothing more or less than an attempt to "put something over."

If a lawyer was presenting his case to a court and expected to obtain justice in that court, yet maintained such relations with judge and jury that the details of those relations could not stand being publicly known, that lawyer might very easily take the position that there could be "too much publicity about 'justice.'" If, on the other hand, his methods were open and above board, and he was seeking only to present the facts to judge and jury and to obtain no unfair advantage over either his adversaries or over the court itself, that lawyer could have no objection to every possible fact concerning the methods of obtaining justice being made known.

Publicity is a science, a fine art, if you will. The beginning and the end of Publicity is an appeal to public opinion. Such an appeal, above all else, must be sincere and frank, not only in the appeal itself, but in every detail with which the appeal is presented. Unless every detail of the effort can be made known, the appeal itself is apt to be futile. Publicity must itself be public; it must be absolutely open and above board. With all the cards on the table, no one can suggest that the game is not being played fairly, and that the public utility company so playing it ought to have a fair show.

But, some people urge, it might not look so well if the public knew we were cultivating the friendship of editors and others in order to induce them to treat of our affairs in a friendly way. Why not, if your effort is only to get what is right and just? If you are trying to obtain a friendliness of treatment the facts will not warrant, the effort ought not to be made any way.

The ELECTRIC RAILWAY JOURNAL believes and has for long believed that the American people are fair. It believes the street railroad companies have a strong case to present to the public, a case demanding relief from burdensome obligations, a case demanding constructive assistance in many directions. There are, of course, some small, possibly weak, links in the big chain, but fundamentally the case is sound. It is sound because the present comfort and convenience of the public is so vitally dependent upon the very present health and prosperity of electric railway companies.

So many companies are afraid of their past. Why not face facts as they are, and make the public see them as you see them. You, a manager, believe yourself to be doing the best you can. You know the difficulties and the weaknesses, but you know the way the scales balance. Let the public know the case as you know it, in all its fulness—and you can rely upon public support to just the extent that your position is in fact sound and deserves public support.

The world is in a melting pot. Precedents, traditions, old-fashioned points of view are being discarded. If the street railroad and the public utilities are to be saved, as saved they must be, they must go—over the heads of lawyers, courts and commissions—to the people.

Trust the people. That is the surest way to make them trust you, and if you can make them trust you, you will have made your foundations really secure.

SALE OF POWER BY THE INTERBOROUGH

A most interesting power contract was signed when the Brooklyn Rapid Transit Company agreed to purchase the energy for the operation of its Manhattan subway lines from the Interborough Rapid Transit Company. Some details of this contract were published in the issue of this paper for March 10. The bid of the Interborough was not only the lowest of those submitted but, so far as we know, it was lower than the price of steam-generated energy furnished anywhere by a power company to an electric railway. The railways in Chicago have a very reasonable rate from the Commonwealth Edison Company, somewhat less than 8 mills per kilowatt-hour in the latest period covered by the last report of the Board of Supervising Engineers, Chicago Traction, but the Interborough contract is for 7 mills for a.c. power under definite conditions of load factor, annual energy consumption and price of coal. The difference of a mill in price is a matter of considerable import when one considers the quantities of energy involved. In the New York case, for example, where 100,000,000 kw.-hr. will soon be consumed annually, this difference represents $100,000 per year. The load factor specified in this case is 42 per cent, which is considerably lower than the average in Chicago, indicating still further the reasonableness of the price to be charged.

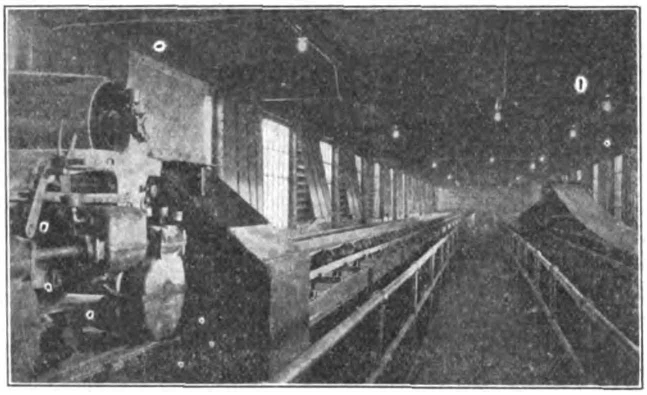
The question naturally arises as to why the Interborough can make such a low price on this business. The circumstances are, of course, too complicated to permit of a simple answer. We note, however, that the railway has stated that it does not expect to make any considerable profit on the transaction; in fact, in estimating the cost of producing the extra power only the additional operating costs and fixed charges made necessary by the increased business were included. In other words, the price is what may be termed an "increment price." It can hardly be taken, therefore, as a criterion for comparison with other charges, including those made by the competing central power companies. It furnishes, however, a datum of reference as to the actual cost of producing additional power in plants of the most modern design, with the largest and most economical units.

Methods for Handling Coal and Ashes

Typical Equipments Are Those in the Power Plants of the Norfolk & Western Railway, the Springfield (Mass.) Street Railway and the Buffalo General Electric Company

THE reception, storage and distribution of coal, and the collection, storage and disposal of ashes are the source of some of the most interesting problems connected with steam power. This is true because there is no standard method of handling these materials and each plant possesses individual characteristics of site, general layout of equipment, etc. There are available, also, a number of devices for handling coal and ashes, such as bucket and belt conveyors, hoists and industrial railways.

As typical of recent practice in this field three power plants have been selected to indicate ways in which some engineers have solved their coal and ashes handling problems. These are the plants of the Norfolk & Western Railway at Bluestone Junction, W. Va., the Springfield (Mass.) Street Railway and the Buffalo General Electric Company. They were selected to show radically different plans adopted in stations of widely differing size and design.



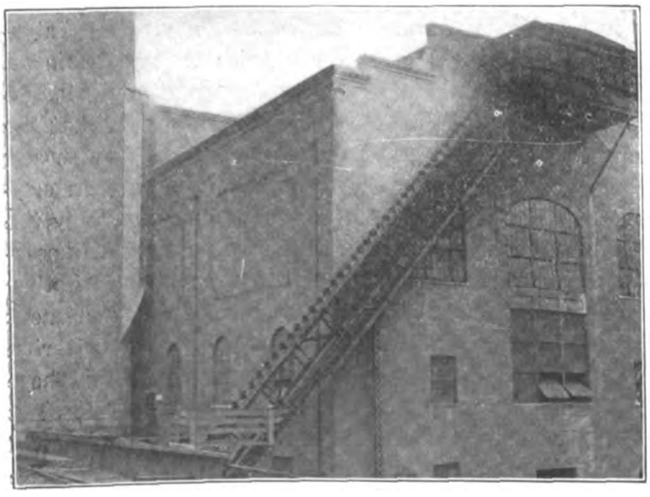
COAL AND ASHES HANDLING—COAL CONVEYING AND DISTRIBUTING APPARATUS, TONAWANDA, PLANT

THE NORFOLK & WESTERN PLANT

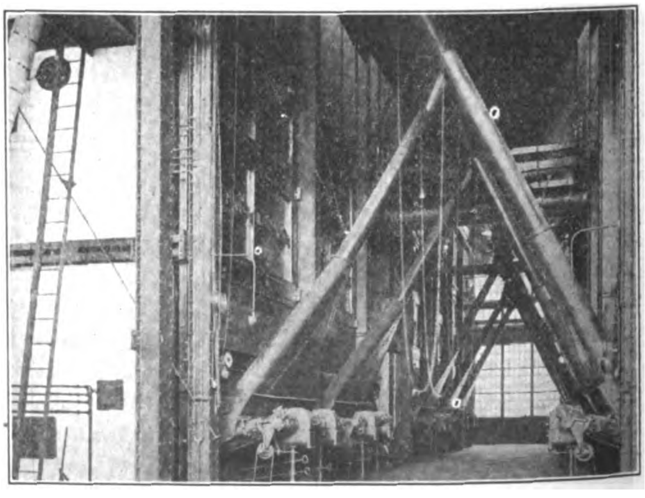
In the Norfolk & Western plant the coal is received in hopper-bottom cars on a siding along one side of the power house, as shown in the illustration below. The cars discharge run-of-mine coal into a 16-ft. x 24-ft. structural steel hopper under the tracks. Below the hopper are a reciprocating feeder and a single-roll crusher which empty into an inclined conveyor of the continuous bucket type, having a capacity of about 60 tons per hour at a speed of 80 ft. per minute. This conveyor elevates the coal about 60 ft. at one end of the boiler room and discharges it into a horizontal distributing conveyor. This conveyor extends longitudinally through the boiler-room monitor and is of the traveling scraper type, having 18-in. x 8-in. flights of 1/4-in. steel plate. The coal is distributed to the storage bins by means of nine hand-wheel operated gates.

The two storage bins, of the steel suspension type, are made of 3/8-in. open-hearth steel plate, and are suspended above and between the boilers from the building girders. Their capacity is approximately 350 tons. The coal-handling machinery is driven by motors, the crusher motor having a rating of aproximately 35 hp., the inclined conveyor motor, one of 15 hp., and the horizontal conveyor motor one of 10 hp. The coal is delivered to the stokers by means of round chutes made from ingot iron plates. These chutes have spreaders on their ends evenly to distribute the coal over the stoker magazine. The bunker is fitted with undercut gates of cast iron operated from the boiler-room floor by hand chains.

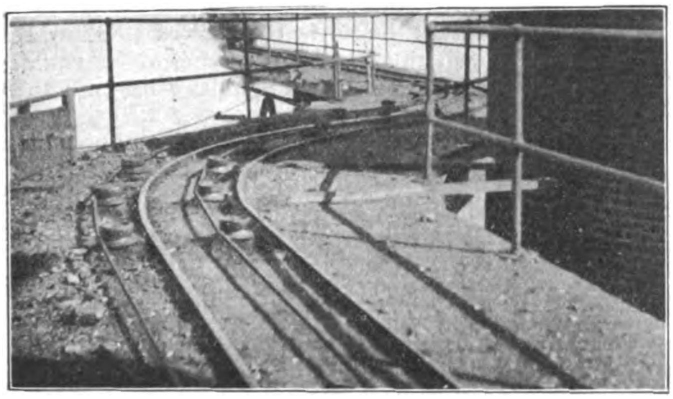
The method used in removing ashes is as follows: A narrow-gage track is located under each row of ash hoppers in the boiler-room basement. Steel platform cars carrying two buckets of 1 cu. yd. capacity each are pushed along these tracks and loaded by gravity from the ashpit hoppers. They are then run outside the boiler-room basement to a loading trolley, shown in an illustration on page 679. This is about 110 ft. long and can accommodate three gondola cars on each track. The buckets are lifted from the small platform cars and emptied into the gondolas by means of a traveling elec-



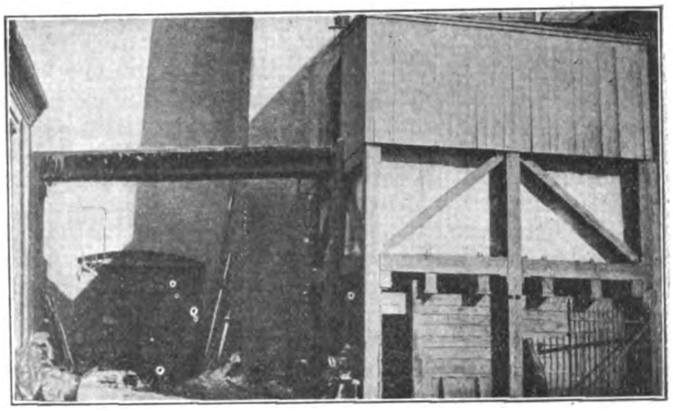
COAL AND ASHES HANDLING—CRUSHER AND BUCKET CONVEYOR, N. & W. RY. PLANT



COAL AND ASHES HANDLING—SUSPENDED COAL BUNKER AND CHUTES, N. & W. RY. PLANT



COAL AND ASHES HANDLING—COAL BRIDGE FOR CABLE CAR, SPRINGFIELD PLANT



COAL AND ASHES HANDLING—ASHES HANDLING BRIDGE AND RECEIVING BIN

tric hoist. Each hoist can handle a working load of 3000 lb., the vertical elevating speed being 30 ft. and the traveling speed 200 ft. per minute. The hoists are controlled from the ground by means of operating arms carried on outriggers. The buckets are of the self-dumping self-righting type. The present installation comprises four of the platform cars and two traveling electric hoists. The entire coal and ashes handling equipment was supplied by the R. H. Beaumont Company.

INDUSTRIAL RAILWAY A FEATURE AT SPRINGFIELD

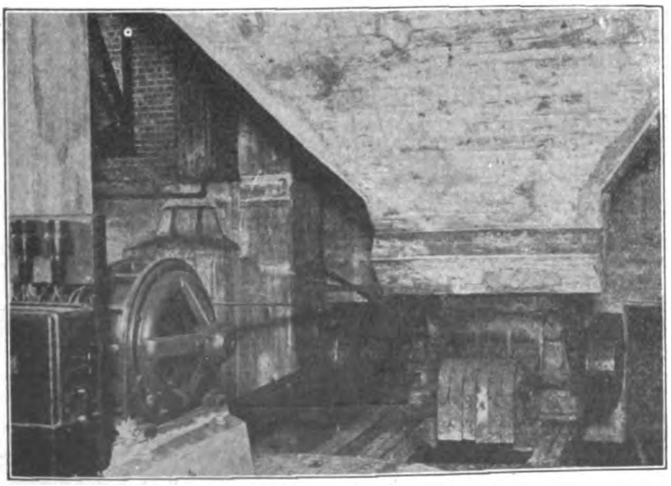
The Margaret Street station of the Springfield Street Railway is located on the east bank of the Connecticut River about 1 mile south of the business center of the city. Its equipment consists mainly of direct-current, engine-driven generators, although 600 kw. in inverted rotaries is in use to supply alternating current for outlying substation distribution service. Between the plant and the river is the right-of-way of the New York, New Haven & Hartford Railroad, which is a factor in limiting the immediate storage capacity for fuel to about 1000 tons. This is provided in a triangular-shaped yard just outside the old boiler room of the station. A reserve coal yard of about 3000 tons capacity is located near the station on the north side of Margaret Street.

This installation of coal and ashes handling equipment was made by the C. W. Hunt Company. It has a capacity of 50 tons per hour and includes a complete mechanical plant for taking the coal from the track hopper to the bunker over the boilers, with motor-driven crusher, conveyor and bucket elevator and cable dump car.

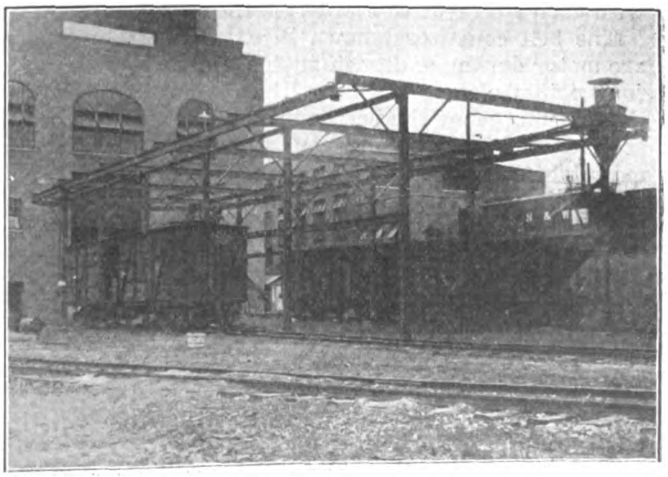
Coal is dumped from cars on a railroad siding into a track hopper and crusher immediately below, the latter being driven by a 25-hp. motor. From the crusher, a bucket conveyor driven by a 50-hp. motor carries the coal on a horizontal run of about 50 ft. to the base of a steel-frame tower, whence the buckets elevate the coal to a height about 50 ft. above ground. The buckets are 15 in. deep, with an average length of 18 in. and an average width of about 16.5 in. These discharge at the top of the tower into the hopper of a set of 10,000-lb. Howe registering scales before delivery into the cable car leading to the overhead bunkers. Coal to be stored in the yard is discharged from the upper part of the tower through 12-in. diameter iron spouts hinged at the top and covering the storage yard area. Several pictures are shown to give the details of the tower and of other features of the equipment.

The cable car has a capacity of 3200 lb., and runs from the tower to the bunkers in the boiler house over a truss bridge about 150 ft. long. One of the illustrations is a view of the top of the bridge, showing the car just returning from the bunkers. The car runs on a track of about 20-in. gage and is equipped with an automatic dumping trip. The cable mechanism is driven by a 7.5-hp. motor mounted in the tower, and the car makes the round trip to and from the bunkers without attendance except that a tower operator looks after the scale records, fills the car and releases it, starts and stops the cable and has general charge of the coal handling. An adjustable trip on the track at the bunker controls the automatic discharge of fuel from the car. The bunker capacity is 300 tons.

Normally this equipment is operated about six hours per day. In winter eight men are employed in coal and ashes handling, exclusive of fireroom service. Four



COAL AND ASHES HANDLING—COAL CRUSHER AND MOTOR, TONAWANDA PLANT

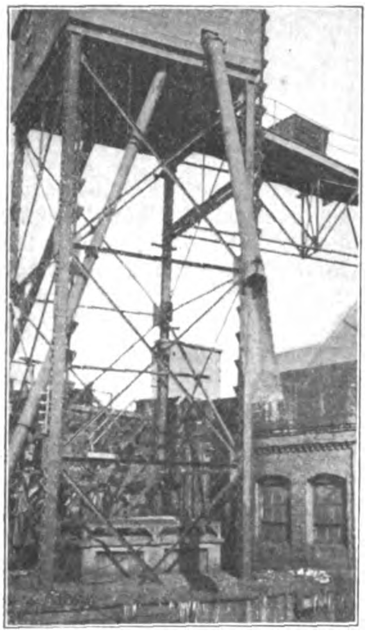


COAL AND ASHES HANDLING—ASHES REMOVING EQUIPMENT, N. & W. RY. PLANT shovelers and ashes handlers are required, and one man devotes his entire attention to the operation of the crusher and conveyor during the hours of operation. The foreman of coal handling attends to oiling gears, shafts, cams, etc., daily and oils the bucket chain weekly.

Ashes are effectively handled in this station by discharging them from the boiler ashpits into a hopper car in the basement, which is run to an elevator and thence by a short overhead bridge to an exterior ash hopper. Teams or trucks receive the ashes from the hopper by gravity.

BELT CONVEYORS USED AT TONAWANDA

In the new 210,000-kw. plant of the Buffalo General Electric Company at Tonawanda, N. Y., coal is at present delivered by rail with a temporary storage maintained by means of locomotive cranes working upon trestles. The coal-handling system within the station was installed by the Mead-Morrison Manufacturing Company. A standard-gage track runs through the station parallel to the north wall. Cars may be dumped two at a time on this track, the coal falling into hoppers below the boiler-room floor level. Each hopper has a capacity of several carloads. A set of track scales is located just outside the building. Below the hoppers are duplicate installations of crushers discharging into bucket elevators, one for each crusher. Each crusher is of the duplex single-roll type, belt-driven by a motor, and is capable of crushing 200 tons of semi-bituminous coal per hour from run-of-mine size to 2 in. Each elevator is motor operated and is capable of lifting 280 tons of coal per hour approximately 135 ft. from the crushers to a belt conveyor above the coal bunkers. One belt conveyor, 30 in. wide and 200 ft. long, is provided for each elevator, a traveling tripper being provided with each conveyor to distribute the coal evenly.

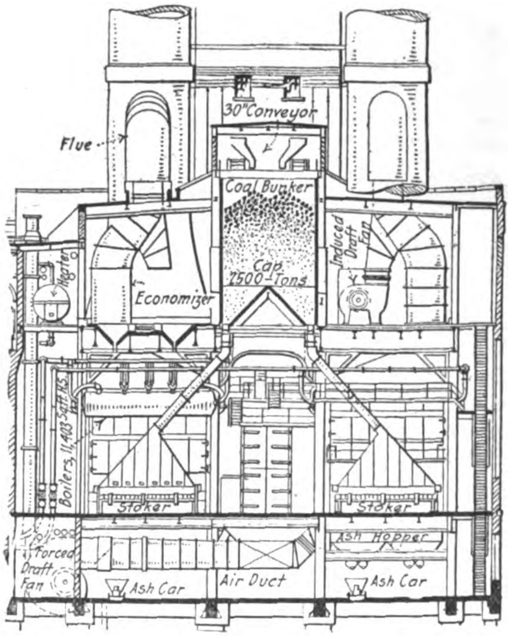


COAL AND ASHES HANDLING—COAL TOWER AND BUCKET CONVEYOR, SPRINGFIELD PLANT

The belt conveyors shown in one of the illustrations are motor driven, and push-button control is provided at four points along the runway beside each conveyor, so that in emergency the belt conveyor, bucket elevator and crusher feeding that conveyor can be stopped. An automatic device prevents the bucket elevators from traveling in the opposite direction in case power is shut off. In the coal-handling bay of the station crane rails are provided for a future traveling coal unloader to be operated above the coal cars to shorten the time of unloading when necessary. Ultimately a modern coal yard with traveling bridge crane and a storage capacity of at least 50,000 tons will be provided, and this will be connected with a coal-handling wharf on the Niagara River by traveling belt conveyors fed from hoisting towers designed for barge unloading.

Coal is fed into the stoker hoppers from a central overhead bunker of 2500 tons capacity through inclined spouts flaring into outlets over the hoppers. A cross-section of the boiler house is reproduced to show this feature. The boilers are set with firing aisles running crosswise of the station, which enables both ends to be readily fired from one central bunker.

Ashes are to be used for filling land about the station for some time to come. These will be removed from hoppers in the basement beneath the furnaces by rocker dump cars of 80 cu. ft. capacity, running on 24-in.-gage tracks and hauled by a 3-ton, double-trolley, direct-current mine locomotive built by the Jeffrey Manufacturing Company.



COAL AND ASHES HANDLING—CROSS-SECTION THROUGH BOILER HOUSE, TONAWANDA PLANT

Cash Boxes Kept in Power Station Vault

The Vicksburg Light & Traction Company, Vicksburg, Miss., of which O. H. Simonds is general manager, operates twenty cars and uses the Cleveland locked type of fare box. The locked coin sections are removed from the cases at the end of the runs at night, are emptied during the night and returned to the cars before the morning runs.

The power station of this road is located adjacent to the carhouse, and when the cars are turned in at night, the locked cash boxes are delivered to the night engineer of the power station. He stores the boxes containing the receipts in a vault built under the concrete steps leading down into the power station. These steps are inside the power station building. A steel door has been built in the vault and a long steel chute leads into one side of this fireproof compartment. The cash boxes as removed from the cars are slid down this chute into the vault. In the morning the company's collector opens the vault, removes the cash, and the boxes are then placed on the cars ready for the early morning runs.

By this method the company is enabled to have the cash turned in to a man who is on duty all night, and who stores it in a place which is especially safe.

A concession has been granted by the city of Madrid, Spain, for the construction and operation of an underground electric railway system to cost about $6,000,000. The subway will be 8.7 miles long.

Practical Results in Publicity Campaigns

Personal Touch Is the Real Miracle Worker—This Is Illustrated by Means of Two Incidents Which Tell Their Own Story

By CHARLES T. HEASLIP
New York City

The following incidents are typical of what is going on to some extent on all public utility properties. Personality plays an important part in the conduct of their business. The case of Bancroft shows what personality can accomplish; that of Smith shows clearly that dividends are not all that a company needs to earn.

IN the issues of this paper for Jan. 27, 1917, page 153, and Feb. 24, page 346, the writer gave the results of some of his experiences which showed how some managers had dealt with politicians and others, in the main successfully. The following two incidents have been selected to bring out the importance of the personal touch in management work.

A MANAGER WITH THE PERSONAL TOUCH

Working for one of the big syndicates that owns the lighting and traction properties in a dozen different cities is a general manager who is the original human dynamo. He generates energy so easily and always has so much in reserve that last year, when his stockholders acquired a new street car and lighting company in a town 100 miles away from his, they turned it over to him to manage instead of looking around for an individual executive for it.

At the same time they increased his salary from $6,000 a year to $12,000, so that in so far as executive expenses were concerned the placing of the dual city properties under one management represented no saving.

But public utility syndicates are not in the habit of paying two men's salaries to one man without having good reason to believe that the additional expenditure will be justified by the results. The directors in this particular syndicate knew what Bancroft had done in one town, and when he told them that he could do it in two by splitting his time between them they believed him. To-day he is operating combination properties that are admiringly spoken of in the public utility field as "humdingers."

Ask his directors what the secret of his remarkable success is and they will rise as one man and say, "Personality!" Ask Bancroft himself and he will chuckle, "Personal touch!" Both are right. Bancroft has as much personality as one "T. R.," and when it comes to finding out what the people want and giving it to them he is every whit as great in his field as the gentleman with the teeth and the horn-rimmed spectacles is in his. He knows his public forward and backward, coming and going—and it supports him to a man.

There are other public utility executives who have studied the public as diligently as this man, but they have made hard work of it and their progress has been slow. Bancroft, however, has a sense of humor. To him, studying folks is just one continuous cabaret show. Yet from all his whimsical observations come deductions as unerring as those of Sherlock Holmes, and as positive in their power to produce a solution of the problem at hand.

"Have you ever given any thought to the momentous question of why people cuss trolley cars?" he once asked me.

"Your cars, or trolleys in general?" I inquired.

"Both," he said, with a twinkle.

"Well," I ventured, recalling an experience of my own that morning, "when one is in a hurry, one usually manages to just miss a car, and its retreating back platform offers an irresistible target for invective."

"Right!" he cried, delightedly. "There are probably a hundred other reasons just as common and just as illuminating, but when you sum it all up it gets down to this:

"When a person is feeling out of sorts, a trolley car is one of the most available and tempting subjects for plain and fancy cussin' that exists. And therein lies a problem that cannot be solved by good service alone."

"What is the solution then?" I asked.

"Keeping in constant touch with your patrons and never letting any kind of a complaint—even the most ridiculous—go unsettled. In other words, never let a grouch remain a grouch if his grouch is directed against you.

"It's not difficult," he continued. "Less than 1 per cent of the 'kickers' ever have a grievance that seems real enough to bring them down to the office with a complaint. But when they do come down we never let them go away with a grouch against us."

If that sounds too idealistic to be true, consider this incident which occurred in Bancroft's office one day while I was present.

A "kicker" of the type that is hardest to handle, the theorist with ideas, came in and explained that he and "a lot of other patrons of the street car company" had difficulty in reading the platform signs that marked the destinations of the various cars.

"The letters are too small," he said, frowning severely at the general manager. "I would suggest that you eliminate the lettered signs entirely and signify the cars' destinations by large numerals, say, 2 ft. high, hung from the front platform. 'No. 1' could mean 'City Hall,' 'No. 2' 'Branch Park,' 'No. 3' 'Terrace Garden,' etc."

"All right," said Bancroft, cheerfully. "We'll put it to a public vote. I'll tell the newspapers about your idea and ask them to request each of their readers who favors it to send me a letter to that effect. If I get a hundred letters I'll put it through."

The idea was put up to the newspapers and well advertised, but fewer than twenty letters concerning it were received, and more than half of these stated that the writers were opposed to "freak stunts," and that the present method of identifying the cars was perfectly satisfactory. As the town had a population of 35,000 the theorist had to admit that his idea wasn't receiving enough public support to warrant its adoption. But he did not feel at all unfriendly toward the company. Instead, he transferred his grouch to his fellow townsmen who were so unappreciative of the "betterment" which he had suggested and "which Mr. Bancroft had treated so courteously."

Bancroft does not limit his missionary work to the "kickers" who take the trouble to come to his office. He rides upon the cars himself, and when he bumps into anyone who is voicing some unfavorable sentiment against the company he promptly gets busy. One afternoon he was riding on one of his suburban lines which is only single-tracked and on which delays sometimes occur at the turnouts. At one of these turnouts the car in which he was riding was held up for eight minutes, waiting for the southbound car to come along and pass it. Seated next to him was a nervous, irritable man who was in a hurry and who simply could not contain his opinion of the traction company after the wait had passed the four-minute stage. Summarized and passed by the board of censors, his opinion was that the company gave the rottenest service in the whole United States.

"No, you are wrong," said Bancroft, with a smile. "Our other company down in Parkerville gives even worse service."

"Who are you?" demanded the irritable one.

"I'm just general manager of the line you've been cussin'," was the cheery reply. "But that's all right, my friend," he hastened to add, as his companion colored and started to explain that minutes were precious to him just then, "I don't blame you a bit. Delays like this do get on one's nerves. But as soon as we get our double-tracking franchise through we won't have any more of them."

And then he proceeded to tell the man all about the improvements that were going to be made, with the net result that when the car finally got downtown his companion forgot all about how precious the minutes were and insisted upon pledging friendship with him over a julep at the Commercial Club.

To help him in his missionary work Bancroft has built up a splendid staff of subordinate officials on each of the properties which he manages. There is not a department head in either of the traction or lighting companies who has not absorbed some of the Bancroft spirit. The result is that he has a compact organization that is working day and night to make friends for the companies. Their motto is, "Keep the public contented!" and they live up to it. All of which makes it comparatively easy for him to get any reasonable favor he wants for his companies from the people, because a contented public will never fight a public utility that it knows is "on the square."

A MANAGER WITHOUT THE PERSONAL TOUCH

But, by the same token, it is mighty difficult for a general manager to convince the public that he and his company are "on the square" when he will not go out of his way to make friends with them.

In another section of the country is one manager who has never learned that fact. He, too, manages both a traction and a lighting company, and is one of the most conscientious workers in the public utility field. But he is continually in hot water. Recently he almost lost a franchise for his street car company because of an enmity that he had stirred up more than two years ago with one of his lighting consumers. The incident responsible for his trouble was a simple affair, but is typical of the molehills that frequently assume mountainous proportions for the public service official who is "shy" on diplomacy.

Smith, the general manager in question, was so loyal to his stockholders that night after night he would work overtime, riding around town in his automobile watching the number of lights his consumers used and estimating what their monthly bills should amount to. Every time there was any marked discrepancy between his estimate and the amount registered by the meter he would send one of his inspectors up to test the meter and see if it was registering correctly. It must be stated in all fairness to Smith, however, that he would call for these tests just as promptly when his estimates tended to show that the consumer was getting the worst of it as when they tended to show that the company was being cheated.

One day he sent an inspector around to the home of James Black, one of the biggest and most influential business men in town.

"Black's meter doesn't seem to be registering half the juice he is using," said the general manager. "I've been riding past his house every night for two weeks now and he's had every light in it blazing, yet his bill for October is only $1.08. His meter is skinning us out of at least $1 a month."

Sure enough, a test showed that it was. It had rusted inside and was running slow. A new meter was substituted and in accordance with the figures on its dial the following month Black's bill jumped to $2.40. Whereupon Black came around to Smith's office and raised a rumpus. Smith could probably have explained things satisfactorily if he had taken the trouble to show Mr. Black his old meter, which was rusted so badly that even a layman would understand that it could not register properly. But he chose, instead, to "pacify" Mr. Black in this fashion:

"You ought to be glad that we are not charging you for the electricity that you used but that your old meter didn't register. But that's the way with you fellows. You take advantage of us as long as you can, and then when we call the turn on you, you get ugly. Gosh hang it! You'd kick if we were giving you the current for nothing!"

Naturally, Mr. Black left the office madder than the proverbial wet hen, and when the traction company's franchise came up on a referendum vote later it was he who led the fight against it.

Smith used the same undiplomatic methods in dealing with his street car patrons. I was in his office once when a woman rang up to inquire about an umbrella which she had left in one of the cars.

"So you left it in the car, eh?" he bawled through the telephone. "Well, that's the way with you women. You're always leaving something behind you. Go down to the carhouse to-night, and if it was found by the conductor and turned in you can have it back."

Then, hanging up the receiver, he turned to me and said:

"By gosh! Those women think a street car company ought to provide guardians for them so they won't forget and leave half their belongings behind them. They make me tired!"

It really never occurred to Smith that he had made an enemy out of that woman, and it would have been futile to tell him so. He would not have understood. He had no imagination. Street cars, in his eyes, were merely machines for collecting nickels from the public. He was in charge of those machines, and it was his duty, as he saw it, to see that no nickels escaped. A careless woman with a lost umbrella was just an incident. Smith did not have even enough vision to see that if he insulted her she would probably not only roast him and his company to all of her friends, but in the future would cheat the company out of fares with more feminine zest than ever.

I am sorry that this latter argument did not occur to me as I sat in Smith's office that day. There is just a chance that it might have given him a new viewpoint, for he was one of the most punctilious guardians of the nickel that I have ever known. His operating expenses were held down to an almost unbelievable minimum, while his gross receipts were always soaring. On the lines that carried good crowds he gave good service. He could see those nickels; they showed on the fare registers. But on the lines where traffic was comparatively light the service was bad, and he kept it so. His vision never extended beyond the nickels in hand.

Smith is still on the job. His stockholders keep him in power because they never have to fight with him to keep expenses down. They know that he makes the "buffalo bellow" before he ever loosens up on one of the new nickels turned in by his conductors. But Smith's stockholders haven't much imagination either. All they see is that the 8 per cent dividends on their holdings are being paid regularly. They fail to see: (1) That the town in which Smith operates is growing rapidly. (2) That public dislike for Smith and his methods are growing proportionately. (3) That some day the public is going to get Smith and the company into a hole, and that it is going to cost them a lot of money before they can clamber out.

When the last-named incident occurs Smith will be dropped from the payroll without compunction and left alone to mourn the ingratitude of stockholders who do not appreciate conscientious nickel-shaving when it comes a cropper.

Famous Old Power Plant Improved

The Niagara Street Plant of the International Railway, Buffalo, N. Y., Is Still Effectively Supplementing the Supply of Niagara Power

TWENTY years ago the Niagara Street plant of the then Buffalo Street Railway figured conspicuously in the columns of the STREET RAILWAY JOURNAL, a predecessor of this paper. Still earlier, in 1891, C. J. Field described it as the latest type of electric street railway practice. In 1894 two vertical Lake Erie engines of 1250 hp. each were added to the earlier equipment of smaller vertical and horizontal engines. These large engines and some of the smaller ones are still in active service. In 1894 a large storage battery was installed to serve as an auxiliary source of energy and this battery is also in daily use, now as then serving the useful function of keeping down the load peaks. In 1898 the power plant capacity was supplemented with about 2000 hp. of Niagara power transformed to direct current in four similar rotary converters. This supply was later increased until at present the output of the old power plant is supplementary to it. The plant is used effectively to keep down the peaks so as to insure the minimum charge for Niagara power, this charge being determined from the peaks in the manner most recently described in the issue of the ELECTRIC RAILWAY JOURNAL for Sept. 13, 1913, page 420.

Under the direction of G. W. Dunlap, now superintendent of power and equipment of the International Railway, some improvements have been recently carried out which are resulting in marked economies. The principal ones relate to the boiler plant, but others affect the engine room and battery room. As a result of the introduction of the improvements described in the following paragraphs it is possible to operate the plant with a total of twenty-eight men working in three shifts. The engines are run from six to nine in the morning and from 4.30 to 7.30 in the evening, the battery being partly discharged in the morning, completely emptied in the evening and charged practically entirely from Niagara power between peaks.

As mentioned in the article describing the new Buffalo-Niagara Falls high-speed line, appearing in the issue of this paper for March 3, page 378, the power plant is being enlarged by the addition of a turbo-generator unit to provide some of the additional power required for that line. This is a 5500-kw. Westinghouse unit containing a three-phase, 25-cycle, 11,000-volt generator. It will not only serve the purpose mentioned but will also reinforce the power supply for the Buffalo city lines.

The boiler room contains nineteen B. & W. boilers which were formerly equipped with Roney stokers. To permit forcing, fifteen of these have been equipped with Riley underfeed stokers and the remaining four are now entirely laid up. This change has not only increased the capacity of the plant but has eliminated smoke, which was objectionable in the neighborhood of the plant.

The combined capacity of the newly equipped boilers is 3450 hp. and they can be forced to 250 per cent of rating. Air, taken from the boiler room, is supplied to the furnaces through a 5-ft. x 6-ft. conduit in the floor of the firing aisle, the pressure under the grate being from 4 in. to 5 in. of water.

The air supply is furnished from two Sturtevant multivane fans driven by steam turbines of 113 brake hp. capacity. Either fan has capacity for the entire plant, supplying 55,000 cu. ft. per minute at 6-in, pressure if desired. The fans are 44 in. in diameter and their speed is from 1400 to 1500 r.p.m. The speed is varied through the medium of an automatic regulator controlled by the steam pressure.

The stokers are supplied with unusually large hoppers which serve as a temporary storage. The stokers are driven by two vertical engines. one of which is held in reserve, connected through a chain drive to a line shaft to which the stokers are clutch-connected. The experiment of automatically regulating the speed of the stoker engines under the control of air pressure was tried, but hand operation was found to be preferable. No other changes were found necessary in the boiler room except the enlarging of the smoke flues to accommodate the increased volume of air.

The coal used is Reynoldsville nut and mine-run slack, mixed, which is stored under roof in an old horse barn adjacent to the power plant, having a capacity of 3000 tons. The coal is brought to the plant in hopper-bottom cars at the level of the Niagara River below, being dumped onto a bucket elevator either direct or through crushers as required. From the top of the elevator it takes one of three routes: (1) It can be dumped onto a Jeffreys plate cross conveyor for delivery to the boiler room; (2) It can be dumped at the foot of the leg of an elevator which is used to raise it to the cross-conveyor already referred to, this plan being used for short time storage, or (3) It can be dumped into a storage conveyor for distribution to the storage pile. The last-named is a rope conveyor with 9-in. discs which is also used for bringing the coal out of storage.

The storage battery auxiliary to this plant consists of 286 cells having a capacity of 1300 kw. for one hour, according to the rating of the original builder, the Electric Storage Battery Company. The cells are of the type known as 53 G and the tanks have capacity for eight additional plates. The battery is now maintained by the Gould Storage Battery Company.

In maintaining the battery distilled water was formerly used and a tank car had to be kept in service for use with this battery and others on the system. This expense has been saved recently by installing filters made by the Allen Filter Service Company after tests which were satisfactory to the battery company. Another improvement in connection with the battery was the installation of circuit breakers on the negative side giving additional protection. There are now three breakers in circuit, one on each side of the battery and one on the positive side of the booster motor. The automatic booster with carbon regulators installed many years ago is still in operation.

City water was formerly used about the power plant for washing boilers and general service. The use of this has been eliminated by installing a tank on the roof of the power plant and an electrically-driven centrifugal pump for raising water from the river level to the tank. For driving the pump an old GE-1000 railway motor was rewound as a shunt motor and belted to the pump. To start and stop the motor an automatic controller was provided, operated in turn by a make-and-break gage connected with the tank. In the engine room a Turner oil filter with a capacity of from 3 to 5 gal. per minute has been installed, and the lighting here and in other parts of the station has been improved by the addition of an automatic switch for throwing the lighting circuit on the main storage battery in case of failure of the regular source of supply.

Steam-Driven Auxiliaries Versus Auxiliary Turbine and Motor-Driven Units

$2,005 Per Year Saving in Favor of Latter Plan as Estimated for Des Moines Station Which Also Supplies Steam for Heating the Company Shops

BY F. C. CHAMBERS
Mechanical and Electrical Engineer, Des Moines City Railway, Des Moines, Iowa

IN selecting the type of auxiliary equipment for use in the new power house now under construction by the Des Moines City Railway the comparative costs of steam-driven auxiliaries and motor-driven auxiliaries supplied with energy from a small auxiliary high-pressure turbine-generator set were worked out as presented herewith. The apparatus is figured for use with a new 5000-kw. General Electric unit, which will be the present equipment of the new power house to operate in conjunction with a 1000-kw. and a 2000-kw. unit in the present plant adjacent. The final figures show an excess first cost of $9,630 for the motor-driven auxiliary

INITIAL AND OPERATING COSTS OF STEAM AND MOTOR-DRIVEN AUXILIARIES

INITIAL COSTS

	Steam	*Motor*
Circulating pump	$2,440	$2,105
Air pump	1,500	1,900
Condensation pump	1,840	1,600
Piping	500	250
Transformers	690	1,800
Switchboard, etc.	650	2,100
Turbine	..	7,500
	$7,620	$17,255

OPERATING COSTS

General Data:

In the following calculations the data given regarding horsepower required and the water rate of turbines has been furnished by manufacturers of this apparatus and represents a fair average for this class of apparatus:

Total number hours' operation per annum	8,768
Kilowatt-hours generated per annum	24,000,000
Feed water rate per kilowatt-hour (pounds)	21
Pounds coal per kilowatt-hour	.3.25
Pounds water evaporated per pound of coal	6
Total pounds feed water per annum	504,000,000
Average temperature of feed water (initial) (deg. Fahr.)	60
Average temperature of feed water (final) (deg. Fahr.)	210
Pounds steam required for heating feed water	73,700,000
Pounds steam required for shop heating	15,600,000
Cost of coal	$1.50
Cost per annum per kilowatt demand	$9.38
Water rate of auxiliary turbine per kilowatt-hour (average) (pounds)	45
Water rate of motor-driven auxiliary per horsepower-hour (pounds)	40
Water rate of circulating pump turbine per horsepower-hour (pounds)	40
Water rate of air pump turbine per horsepower-hour (pounds)	30
Water rate of condenser pump turbine per horsepower-hour (pounds)	60
Water rate of exciter turbine per kilowatt-hour (p'nds)	75
Water rate of stoker engine turbine per horsepower-hour (pounds)	60
Water rate of boiler feed pumps per horsepower-hour (pounds)	75
Water rate of main turbine units per horsepower-hour (pounds)	18

STEAM-DRIVEN AUXILIARIES

Circulating pump 50 hp. at 40 lb.	8768 hr. lb. steam	17,500,000
Air pump 20 hp. at 30 lb.	8768 hr. lb. steam	5,260,000
Condenser pump 5 hp. at 60 lb.	8768 hr. lb. steam	2,638,000
Exciter 20 kw. at 75 lb.	8768 hr. lb. steam	13,180,000
Stoker engine, 5 hp. at 60 lb.	8768 hr. lb. steam	2,630,000
Boiler feed, 16 hp. at 75 lb.	8768 hr. lb. steam	10,520,000
Total steam per annum from auxiliaries		51,728,000

TOTAL STEAM REQUIRED PER ANNUM

Heating boiler feed (pounds)	73,700,000
For shop heating	15,600,000
Total (pounds)	89,300,000
Pounds steam available from auxiliaries	51,728,000
Pounds live steam required from boilers	37,572,000

Pounds fuel required for producing steam for auxiliaries and shop heating	14,880,000
Cost of fuel at $1.50 per ton	$11,160,000
Kilowatt-hours for blowers and miscellaneous auxiliaries, 35 hp. 8768 hours	2,300.00
Cost of current at ¼c. per kilowatt-hour (fuel charge)	$575.00
Maximum kilowatt demand by blowers and miscellaneous auxiliaries	26.25
Maximum demand cost for blowers and miscellaneous auxiliaries	$246.00

TOTAL COST OPERATION OF STEAM AUXILIARIES

Fuel	$11,160.00
Electrical energy	575.00
Station demand charge	246.00
Total	$11,981.00

MOTOR-DRIVEN AUXILIARIES

Circulating pump	50 hp. at 40 lb.	8768 hr. lb. steam	17,520,000
Air pump	20 hp. at 40 lb.	8768 hr. lb. steam	7,020,000
Condenser pump	5 hp. at 40 lb.	8768 hr. lb. steam	1,752,000
Exciter	35 hp. at 40 lb.	8768 hr. lb. steam	12,480,000
Stokers	5 hp. at 40 lb.	8768 hr. lb. steam	1,752,000
Blowers and miscellaneous	35 hp. at 75 lb.	8768 hr. lb. steam	12,480,000
Boiler feed pumps	16 hp. at 75 lb.		10,520,000
Total pounds steam per annum from auxiliaries			63,524,000

TOTAL STEAM REQUIRED PER ANNUM

Heating boiler feed	73,700,000
Shop heating	15,600,000
Total	89,300,000
Pounds steam available from auxiliaries	83,524,000
Pounds excess steam required from auxiliary turbine	25,776,000
Pounds fuel required for producing steam for auxiliary and shop heating	14,880,000
Cost of fuel at $1.50 per ton	$11,160.00
Available kilowatt-hours from excess steam	552,000
Saving in fuel at 3.25 lb. per kilowatt-hour (pounds)	1,860,000
Saving cost of fuel	$1,395.00
Additional station kilowatt capacity available from auxiliary turbine without increasing demand on boiler plant above requirements of steam-driven auxiliaries	65
Saving in demand charge due to increased station capacity	$610.00

TOTAL COST OPERATION MOTOR-DRIVEN AUXILIARIES

Cost of fuel		$11,160.00
Credit due to saving in fuel	$1,395.00	
Credit due to increase in station capacity	610.00	
Total credit	$2,005.00	2,005.00
Net operating cost		$9,155.00

RECAPITULATION

	Combined Motor and Steam	*Motor*	*Difference*
Total initial investment	$7,620.00	$17,255.00	$9,630.00
Total operating cost	11,981.00	9,155.00	2,005.00
Per cent saving on investment			20.83

equipment as compared with the steam-driven auxiliary equipment, but a saving in annual operating costs of $2,005, which represents a saving of 20.83 per cent per year on the excess investment for motor drive. This is a significant saving in the total operating cost of the plant and is what determined the selection of completely motor-driven auxiliaries for the new station.

Going into some of the details in comparing the two types of equipment, it should be noted that the general plan of operation for the motor-driven auxiliaries is to use the auxiliary turbine supplying energy to these motors as a means of supplying just the amount of exhaust steam needed for feed-water heating and for heating the company's shops close at hand. In winter, instead of using live steam to make up the amount needed for heating in addition to that supplied by the exhaust from the auxiliaries, with steam drive, the auxiliary turbine is loaded up electrically sufficiently to supply the full demands of the shop and feed-water heating.

The generating voltage of the auxiliary turbine set is stepped up through transformers so that this source of energy may be connected to the main station bus and the surplus energy used to help carry the load on the plant, or lighten that much the load on the main generators. By this means no live steam is supplied to the exhaust mains, but rather, whatever the requirements, they are supplied through the auxiliary turbine which functions as a pressure-reducing valve and in addition utilizes the energy given up in the expansion. In summer, on the other hand, the reverse operation takes place. The auxiliary turbine, generating energy up to the requirements of the motor-driven auxiliaries, will deliver more exhaust steam than can be used in the feed-water heater, and none is required for shop heating. Hence a portion of the energy for the motors is taken off the main station bus through the transformers and the auxiliary turbine is loaded only to the point of supplying enough exhaust steam for the feed-water heater requirements.

In the comparison of the two auxiliary systems, the blowers, house pumps, sump pumps, etc., were planned to be motor-driven under either system, and in the operating costs for the steam-driven auxiliary the cost of current for driving these and the cost of the station capacity for supplying this energy are included.

No estimate of the comparative maintenance cost of the two systems was made, since no definite data relative to the cost of maintaining small turbines were available. However, it is undoubtedly true that the cost of maintaining one comparatively large turbine will be considerably less than that of maintaining a number of smaller units. The cost of maintenance on motors would be practically nothing, as these will be of a slow-speed induction type. If the comparative maintenance cost of the two systems had been estimated, there would probably be a much larger saving shown in favor of the motor drive.

Considering the flexibility of operation and the comparative labor required for the two systems, the advantages are nearly all in favor of the auxiliary turbine drive. The time required to place the apparatus in operation is much less with motor-drive than with steam drive, since in the latter case it is necessary to drain the condensation from the steam lines and warm up the turbine slightly before it is possible to start up each of the several units. In the Des Moines plant this operation would be necessary four times in each twenty-four hours, and this in itself would be quite an item so far as labor is concerned, although it would depend altogether upon the conditions whether or not this would require any additional men. With steam drive, there would also be a steam and exhaust line to each one of the auxiliaries, which would be a source of constant loss throughout the year, due to the condensation in the lines, whether the auxiliaries were in use or not. This is true because it is necessary to have steam available at the throttle at all times in order to put the apparatus into operation upon demand in the shortest possible time. These conditions have not been taken into consideration in estimating the relative costs given herewith.

With steam-driven auxiliaries it would be necessary to provide a much larger auxiliary header adjacent to the main steam header, and also a larger exhaust header for the auxiliaries than would be installed under the plan adopted. These additional costs were not included in the figures given in the table, but this would probably amount to $300 or $400, and would in turn add a slight additional amount to the maintenance costs.

Workmen's Compensation Insurance

Plan of Compulsory Employers' Mutual Association Is Said to Deserve Thorough Trial in This Country

IN a recent issue of the *Journal of Political Economy*, E. H. Downey, Harrisburg, Pa., presented a general review of workmen's compensation insurance. After studying the diverse methods for carrying on such insurance in this country, Mr. Downey concludes that the present competitive organization is inappropriate. Competitive insurance is exceptionally wasteful in operation, inefficient for accident prevention and unfairly discriminatory in its incidence of burdens, and it fails even to meet the elementary requirement of ultimate security. Many of these defects, in his opinion, can be overcome by effective public regulation, but this deprives the system of every characteristic of competition except its unnecessary cost. From the point of view of social utility, Mr. Downey believes, the case for monopoly is fairly overwhelming. The choice lies, therefore, between compulsory state and compulsory mutual insurance.

Actual experience with compulsory state compensation insurance has been too brief and too limited to admit of any definite conclusions. Exclusive, or substantially exclusive, state funds exist in Norway, Ontario, Ohio, Washington, Oregon and Nevada. The bill of particulars against such experiments is formidable enough, but Mr. Downey notes that none of the shortcomings is inherent in state insurance. The feasibility of state insurance is purely a question of intelligent organization in the first instance and of efficient administration afterward. Whether these conditions are likely soon to be fulfilled in many American commonwealths may be fairly debatable.

Compulsory employers' mutual associations have a history of thirty-five years in Germany, and a record of social achievement to which private accident insurance affords no parallel, according to Mr. Downey. This mode of organization is not comprised among the many American experiments. A compulsory association of this character would be relatively free from politics; it would be at least as economical as state insurance, and it would stand a far better chance of administrative efficiency. In the very important respect of accident prevention, compulsory employers' mutuals should secure the maximum attainable results. In short, Mr. Downey says, the plan promises so well *a priori* and has worked so well abroad, that it deserves a fair trial in at least one of the larger industrial commonwealths of this country.

Chicago Traffic, Value and Finances

Methods Used by Traction and Subway Commission in Checking Travel for Unified System—Cost and Present Value of Elevated Lines—Summary of Financial Plan

THE main report of the Chicago Traction and Subway Commission in regard to a unified system of transportation in that city was presented in detail in the ELECTRIC RAILWAY JOURNAL of Dec. 9 and Dec. 23, 1916. Since that time there have also been published in the issue of March 10 an abstract of the supplementary chapter dealing with estimates of future city growth and, in the issue of March 31, an abstract of that describing the industrial survey carried on by the commission.

The remainder of the thirteen chapters of the supplement, containing miscellaneous engineering, statistical and financial data that served as a basis for the commission's recommendations, will not be reviewed at length in these pages, on account of their volume, the purely local character of much of the information and the availability of the full report. For this last article, however, abstracts have been made of certain sections that may be of general interest. These deal with the methods used in checking the elevated and surface traffic, with the reproduction cost new and present value totals for the elevated properties, and with the general financial plan of the unification.

ELEVATED TRAFFIC INVESTIGATION

Besides making an investigation of the elevated station traffic records, which showed among several things the more rapid growth in the outlying residential sections, the commissioners made a complete twenty-four-hour check to determine the riding characteristics of elevated passengers. This check was unique in its field on account of the volume of traffic observed and the size of the system involved.

An identification slip was issued by a commission observer to each passenger as he entered an elevated station at the beginning of his journey, which he carried through his trip, returning it as he left the station at the end of his journey. Each slip had printed on its face the list of stations, with the name of the particular station at which the ticket was issued marked to identify the boarding point, while the destination station was known by the place of collection. No marking of the slips in the field was necessary.

As tickets were collected, they were placed in envelopes separately marked by hours, thus recording the traffic for each hour of the twenty-four. Thus, the slips collected at any station and automatically separated as to destination and hour of the day, needed to be sorted only for the 206 possible stations of origin. The sorting and counting of the slips for this fact was done by machines, using a card punched for each identification slip to show the hour of the day, station origin and station destination. These cards were then machine sorted and counted by Powers accounting machines, and the data recorded on station sheets, showing the total passengers to each station from every other station for each hour. A final cross tabulation for the complete twenty-four-hour period was made, showing the total passengers from each of the 206 stations to every other station.

Various methods of publicity were used to instruct the public in what was expected of them, and no difficulty was experienced in any part of the city. The completeness of this co-operation is evidenced by the fact that of the 536,000 people using the elevated system during the check, more than 93.2 per cent surrendered slips at the end of the journey. This percentage does not include any that were mutilated, falsely marked or otherwise in doubt, and therefore represents the net usable result.

Besides indicating a true average haul of 6.48 miles, the check provided data showing that the traffic from opposite sides of the city across the loop is delivered principally to definite districts, each class of traffic having distinct characteristics. Moreover, the analysis proved that the term "loop district" is no longer descriptive of the whole central business district, which has already extended far south, north and west of the Union Loop elevated structure, as far as traffic delivery is concerned. The check showed also a failure on the part of the elevated railroads to secure as large a proportion of the long-haul business as should naturally come to them in many districts, more speed being necessary.

EXAMINATION OF SURFACE LINES

The investigation of surface-line traffic developed the fact that the average ride varies from 1½ to 3½ miles. The average speed in some cases approaches average rapid transit running time. It was found to vary from 8 to 15 m.p.h., depending on the location of the route and the hour of the day. The area covered by the surface system, the one fare, the universal transfer and the high running speed have combined to give it nearly 78 per cent of the daily 2,520,000 revenue passengers and 85 per cent of the 4,000,000 revenue and transfer passengers of the city.

In order to obtain complete information regarding the origin and destination of passengers, a check was made on the important lines. The check was based on the traffic on an ordinary week day, every fourth car on a line being observed. The direction of transfer was noted in other ways than in the general traffic check in order not to overload the observers.

Identification slips were printed for the two directions of each line. The line was divided into a number of sections about ½ mile in length, each including only one transfer point. The sections had serial numbers, placed between the two blank columns designated "On" and "Off." The sections were also designated by the names of the limiting streets, and the house number at the beginning of the section was given to the left of the street names.

Observers were placed on the rear and front platforms, the rear observers marking the boarding section by pencil or punch mark and handing the slip to the passenger. Either the rear or the front observer collected the slip from the passenger at the end of his journey. The front observer also made observations of the actual running time of the car at each section point. The observer on the rear platform was unable to attend to the duties both of issuing and collecting on heavily-loaded cars in the rush periods, and a third man was placed on the car to assist him.

The slips were placed in an envelope at the end of each half trip, marked with the time of start and end of the trip, the running time at each section point, the number of transfers collected, the cash fares registered, and the total number of slips issued and collected. When the envolopes were turned in they were coded for four periods of the day, as follows: 6 a. m. to 9 a. m.; 9 a. m. to 4 p. m.; 4 p. m. to 7 p. m., and 7 p. m. to midnight. The cards were then punched for date, line, direction, period, section on and section off, and were sorted by machines for the last four facts. Cross tabulations, similar to the elevated check, were made for each direction, and each period, and a total for the day, thus making five tabulations for each direction, or ten in all.

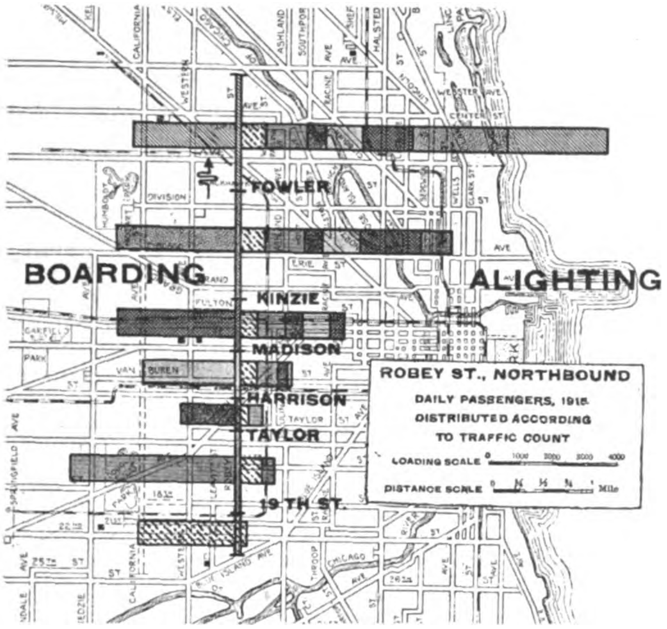

BOARDING
ALIGHTING
FOWLER
KINZIE
MADISON
HARRISON
TAYLOR
19TH ST.
ROBEY ST., NORTHBOUND
DAILY PASSENGERS, 1916
DISTRIBUTED ACCORDING TO TRAFFIC COUNT
LOADING SCALE 0 1000 2000 3000 4000
DISTANCE SCALE 0 ¼ ½ ¾ 1 Mile
CALIFORNIA
WESTERN
ASHLAND
SOUTHPORT
RACINE
HALSTED
LINCOLN
WEBSTER AVE
CENTER ST
DIVISION
HUMBOLDT PARK
WELLS
CLARK ST
ERIE
GRAND
FULTON
GARFIELD
VAN BUREN
TAYLOR
SPRINGFIELD
18TH
22ND
25TH ST
BLUE ISLAND AVE
THROOP
CHICAGO
RIVER

FIG. 1—SPECIMEN CHART SHOWING PASSENGER DISTRIBUTION BASED ON TRAFFIC COUNT

Besides tabulating the collected data, the commissioners used them in making graphical averages. For example, Fig. 1 illustrates the northbound traffic on the Robey Street line, with passengers boarding in the various sections shown to the left of the vertical line, and passengers alighting shown to the right of the same line. The height of the column, in each case, shows the relative number of passengers. A different shading is used for each section, and the same shading to the left and right represents a traffic movement. For instance, the passengers boarding the line between Blue Island Avenue and Nineteenth Street are shown by the dot and dash hatched symbol to the left, and total about 3000. The same symbol to the right shows the portion of these passengers alighting in each section.

THE TRANSFER QUESTION

Separate transfer observations were made by issuing special transfers (standard transfers with two lower corners cut off) on each line on a separate day. The conductors on the receiving lines intersecting the line of issue separated the special transfers into two lots, one for each direction of travel of his car. The standard transfer of the surface lines shows, by its color and punching, the direction of the issuing car, and therefore the direction of travel of the car on the issuing line could be determined. In this way the four transfer movements at all intersections were determined.

To determine the proportion of passengers retransferring, a special check was made by the method of identification tickets on four lines of heavy transfer. Slips were issued only to passengers presenting transfers, and marked to show the direction of the car from which the transfer was received (determined by its color). Notation was also made which showed the color of transfer taken by these passengers. The results represented the minimum figures for retransfer.

Under the plan of unification of surface, elevated and subway lines, it is proposed to provide transfers at all intersections of surface lines with elevated and subway lines where stations now exist or will be built, this to be limited only by the exclusion of transfers between surface and rapid transit lines in the loop district.

In estimating future rapid transit surface transfers, the commissioners collected definite information from 6000 rush-hour workers employed in typical office buildings in the central business district. The information supplied regarding these 6000 workers gave definitely

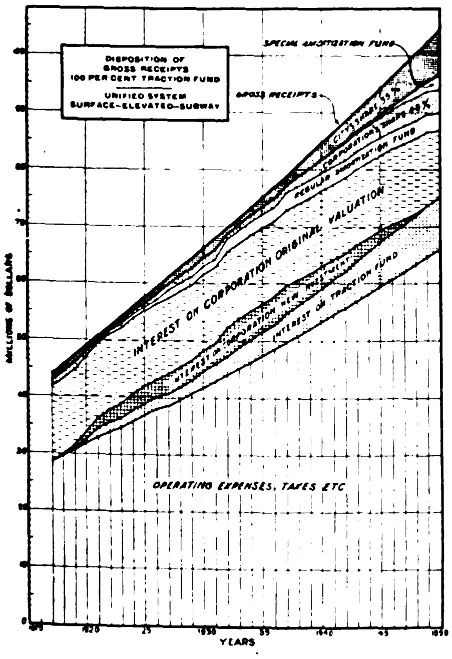


FIG. 3—CHART SHOWING PROPOSED DISTRIBUTION OF GROSS RECEIPTS UNDER 100-PER CENT TRACTION FUND PLAN

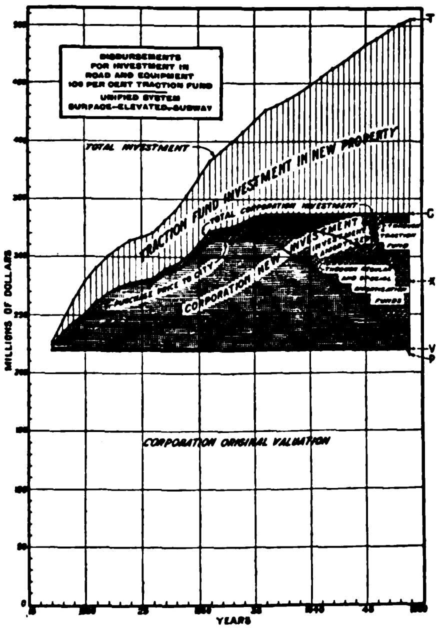


FIG. 2—CHART SHOWING PROPOSED INVESTMENT IN UNIFIED SYSTEM UNDER 100-PER CENT TRACTION FUND PLAN

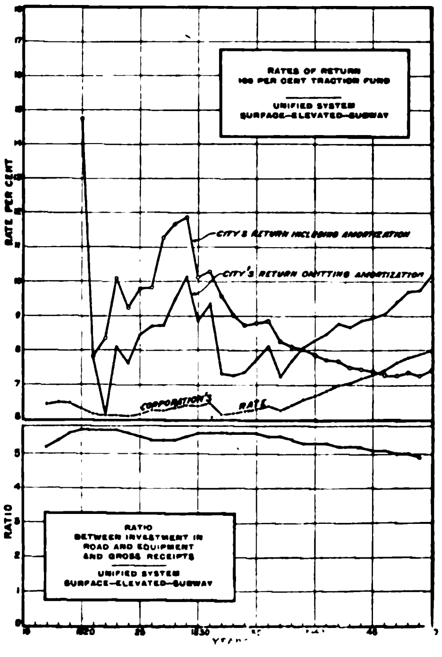


FIG. 4—CHART SHOWING RATES OF RETURN FOR UNIFIED SYSTEM AND RATIO BETWEEN INVESTMENT AND GROSS RECEIPTS

the places of residence, employment and the method of transportation used, whether elevated, surface or steam railroad. These workers were then grouped according to place of residence, making sixty or seventy residence groups, scattered all over the city at various distances from the central business district. For each group the traveling time was figured, via surface lines and via elevated railroads, the difference giving the time saving for each group by use of the rapid transit. For each individual of the group it was known which method of transportation was used and, therefore, the percentage of the group using the rapid transit. Knowing these percentages, it was possible to plot a curve showing the probable percentage of total passengers who would elect to use the rapid transit for various amounts of time saved. The curve showed that the percentage choosing rapid transit varies from 10 per cent for about three minutes saved, 60 per cent for ten minutes saved, 80 per cent for fourteen minutes saved, to more than 95 per cent for savings of twenty minutes and more.

By using these percentages it was determined that a transfer may be expected between surface and rapid transit lines, in both directions, of about 117,000 passengers daily. This number is between 5 and 6 per cent of the revenue passengers carried by the surface lines on an average day in 1916. This figure is based on a free transfer, and under the proposed 2-cent charge the amount is estimated to be reduced to 75,000 the first year, rising 15,000 a year until 150,000 in the fifth year.

VALUATION OF ELEVATED PROPERTY

The supplementary report contains a chapter dealing specially with the principles of valuation applied in determining the cost of the physical property of the elevated lines and the treatment accorded individual items in the official classification of accounts. Owing to the fact that this information formed the basis of a paper by F. J. Bachelder, valuation engineer of the commission, published in the ELECTRIC RAILWAY JOURNAL of March 3, page 386, none of the details will be repeated here. There is reproduced, however, a table showing the reproduction cost new and the present value of the various parts of the land, right-of-way and other physical property.

VALUATION OF CHICAGO ELEVATED PROPERTIES AS OF JUNE 30, 1916

Right of Way	Reproduction Cost, New	Present Value
Bare land and easements—total acquired by companies	$13,203,583	$13,203,583
Other land—not used or useful (deduct)	465,204	465,204
Bare land—used or useful for railway purposes	$12,738,379	$12,738,379
Value of leaseholds	261,894	261,894
Other buildings owned—on land not used but useful for railroad purposes	231,671	231,671
Total land and buildings used or useful for railway purposes	$13,231,944	$13,231,944
Acquisition costs	1,323,194	1,323,194
Right-of-way easements	138,329	138,329
Total right-of-way—land, buildings and easements	$14,693,467	$14,693,467
Engineering on total right-of-way, land and easements	293,869	293,869
Total right-of-way	$14,987,336	$14,987,336
Other Physical Property		
Cost of reproduction, new	$43,961,481	$34,658,372
Contingencies to cover omissions and miscellaneous construction costs	2,198,074	1,732,919
Administration on other physical property	1,200,000	1,110,000
Engineering on other physical property plus contingencies	2,307,978	2,063,772
Paving on city streets and alleys	125,894	102,664
Bridge easements	45,000	45,000
Total other physical property, etc.	$49,838,427	$39,712,727
Taxes and insurance during construction:		
(a) Taxes on total right-of-way	$739,666	$739,666
(b) Taxes on other physical property	429,745	429,745
(c) Insurance	31,851	31,851
Interest during construction:		
(a) On total right-of-way	2,697,720	2,697,720
(b) On total other physical property	4,485,458	4,485,458
(c) On taxes and insurance	72,076	72,076
Plant development costs—actual money spent for permanent physical structure, not subject to frequent renewals	382,387	267,670
Total right-of-way and other physical property	$73,664,666	$63,424,249
Agreed general allowance, not specifically determined in the organization, development and production of the operating property	8,103,113	6,976,667
Grand total reproduction cost, new	$81,767,779	$70,400,916

THE FINANCIAL PLAN

The financial plan of the commission contemplates the investment of all the traction fund in the property. The report also gives the city the option of expending 25 per cent of the traction fund in improvements which will not earn revenue. This leads to two statements of the estimated results of the plan, but for purpose of illustration only the first will be here used.

The data regarding investment, besides being tabu-

SPECIMEN INCOME STATEMENT FOR CALENDAR YEAR 1948, SHOWING FINANCIAL PLAN OF UNIFIED SYSTEM

Gross receipts			$100,468,000
Maintenance	Estimated to be 63 per cent		
Replacements and renewals			
Other operating expenses, deductions from gross income, except interest on capital, and profit and loss debits			
Taxes			
Expenses of the board of regulation and control, except those pertaining to investment in road and equipment			
			63,295,000
Net receipts			$37,173,000
Deduct:			
City of Chicago:			
Interest on traction fund investment at the same rate as next item		$8,535,000	
Chicago Railways Corporation:			
Interest paid on capital obligations issued to cover investment in road and equipment after the plan becomes effective		482,000	
Interest on investment in road and equipment made before the plan becomes effective, at 6 per cent a year		13,200,000	
Regular amortization fund:			
1922 to 1926, ¼ per cent; 1927 to 1932, ½ per cent; 1933 to 1937, ¾ per cent; after 1947, 1 per cent. In all cases calculated on the then purchase price to the city except that in no year shall it be less than in the year just preceding		3,108,000	25,325,000
Divisible net receipts			$11,848,000
Distribution:			
Chicago Railways Corporation:			
45 per cent, but never less in any year than 1 per cent of the gross receipts or more than enough to make the total return in any year 8 per cent on the purchase price to the city. (See note)			$4,093,000
City of Chicago:			
55 per cent, less any amount necessary to make the corporation's share of the divisible net receipts equal in any year to 1 per cent of the gross receipts. Such drafts to become a first lien on any excess in subsequent years of the corporation's share of the divisible net receipts over 1 per cent of the gross receipts			6,516,000
Special amortization fund:			
Excess income allotment as defined in note			1,239,000

Note:

The sum of the two company interest deductions and 45 per cent of the divisible net receipts is the total potential income of the corporation and is designated "income fund." The amount of the income fund in any year in excess of 7 per cent on the purchase price to the city of the property in use is designated "excess income." This excess income is divided as follows:

1. When not greater than 1 per cent of the purchase price: To the corporation, two-thirds; to the special amortization fund, one-third.

2. When greater than 1 per cent but not greater than 2 per cent of the purchase price: To the corporation, ⅔ per cent of purchase price plus one-third of the amount over 1 per cent of the purchase price; to the special amortization fund, ⅓ per cent of the purchase price plus two-thirds of the amount over 1 per cent of the purchase price.

3. When greater than 2 per cent of the purchase price: To the corporation, 1 per cent of the purchase price; to the special amortization fund, all over 1 per cent of the purchase price.

The effect of this distribution of the excess income is to limit the corporation's return in any year to 8 per cent of the purchase price to the city.

lated, is presented in graphical form (Fig. 2), where the various items may be thus explained:

Total Investment (*T*): This is the total investment in the property regardless of the sources from which the funds are derived.

Traction Fund Investment: The total invested by the traction fund is represented by the ordinates between *T* and *X*. The ordinates between *T* and *C* represent the cash put into the project for the carrying on of new construction or the purchase of new equipment. The ordinates between *C* and *X* represent the excess of the traction fund over that necessary for the purposes just mentioned, which is, therefore, used to amortize previous expenditures for investment in road and equipment, made by the corporation.

Corporation Investment (*C*): This represents the total investment of the corporation, both old and new, regardless of the fact that some of it may have been amortized.

Corporation New Investment: The ordinates between *C* and *V* represent the new capital raised by the corporation regardless of the fact that some of it may have been amortized, as it is assumed that the amortization funds will be used immediately as a sinking fund to retire outstanding bonds, and that for funds to carry on new construction and purchase new equipment it will be necessary for the corporation to issue new securities.

Regular and Special Amortization Funds: The ordinates between *X* and *P* represent the amortization through the regular amortization fund, which is started at one-quarter of 1 per cent five years after the plan becomes operative, and the special amortization fund, which is a portion of the divisible net receipts in excess of enough to give the corporation a return of 7 per cent.

Purchase Price to the City (*P*): This represents the price at which the city may take over the property at any time and is the sum of the original valuation and the new investment less any amortization.

Original Valuation (*V*): This is taken at $220,000,000—the purchase price to-day of the surface lines plus the commissioners' valuation of the elevated lines, plus any certificates that may be issued between June 30, 1916, and the time the plan goes into effect, plus any amount which would be covered by such certificates if the elevated lines were under the 1907 and subsequent ordinances.

Fig. 3 shows the proposed distribution of gross receipts under the 100-per cent traction fund plan. Another description of the financial plan, in the form of a specimen income statement for the calendar year 1948, is shown in one of the tables on the opposite page. Fig. 4 shows the rates of return for the unified system under the 100-per cent traction fund plan, and the ratio between the investment in road and equipment and the gross receipts.

Syracuse Grade Separation Report

B. J. Arnold Reports Electrification Not Feasible and Recommends the Use of the Old Central Railroad Station for Combined Interurban Terminal and Market

IN the report upon the grade crossing situation in Syracuse by Bion J. Arnold, which has recently been made public, certain interesting provisions for the entrance of interurban lines into Syracuse are mentioned. In general, the report lays out a plan for depressing the steam railroad entrances and for rerouting some of the lines so that the present Franklin Street steam station would be abandoned. The report also recommends the use of the old Erie Canal cut for an interurban entrance into the city and the use of the abandoned Franklin Street steam station as a joint electric passenger and express terminal and public market.

The suburban and interurban travel in and out of Syracuse now amounts to 4,280,000 passengers per year, or about 13 per cent of the Syracuse city traffic. Statistics follow:

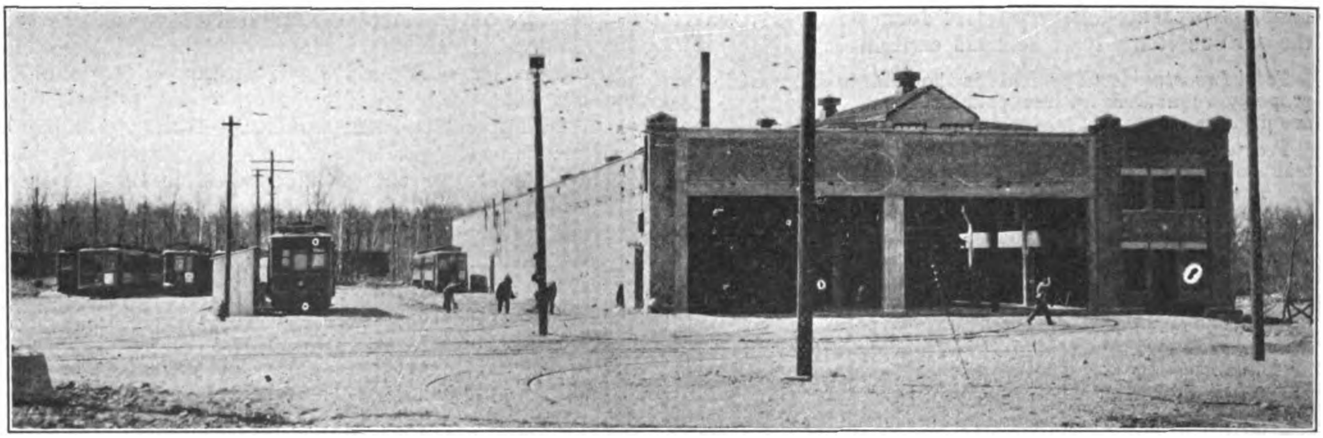
Steam trains, through and local	7 per cent
Electric, suburban and interurban	10.5 per cent
Syracuse surface lines, revenue passengers	82.5 per cent
Total passengers per year, all roads, approximately	40,000,000

The possible removal of the interurban lines from city streets to private rights-of-way through the canal bed to the east, north and west respectively was studied, but did not appear feasible either at the present time or in the immediate future. One reason is the financial limitations of the various properties under present rates of fare and the great dependence of interurban lines upon maximum convenience to their patrons through service to the central parts of the city. Another reason is that the business streets where frequent stops are necessary lie generally within the 1.5-mile zone, and it is possible for interurbans to proceed beyond the limit of this zone and reach free-running territory, beyond the limits of the proposed canal bed entrances, within from ten to fifteen minutes. As compared with interurban conditions in Detroit, Cleveland, Cincinnati, Pittsburgh, etc., where thirty to sixty minutes are required for interurbans to reach reasonable free-running territory, the entrance conditions to Syracuse were not considered particularly unfavorable at present. As regards the possibility of developing portions of the canal strip for rapid-transit entrances where most needed, and particularly when this can be done in conjunction with steam railroad entrances as was called for in the grade separation plan, the report concludes that this question appears in a much more favorable light.

In keeping with the tendency in various cities to bring all interurban lines into a common terminal, the report provides for the utilization of the present Franklin Street passenger station of the New York Central lines, when abandoned, for the interurban lines. Such extensive facilities would of course be unnecessary for the present interurban business, but the use of the abandoned station as a public market and interurban station combined might prove to be a justifiable arrangement. By this means the interurban lines would find it possible to develop at first hand a form of express business that has proved exceedingly profitable in other interurban centers.

ELECTRIFICATION POSSIBILITIES

As regards the possibility of electrification of the steam railroads through Syracuse, the report states emphatically that as a terminal proposition alone the electrification even of the New York Central lines cannot be considered feasible until such time as the main line is electrified, at least for passenger traffic. Terminal electrification alone would necessitate a complete equipment of engine houses and lay-over facilities at or near the junction points, east or west. For even a stub-end passenger terminal branching off the main line, this necessity would be serious enough, but for a through station practically a duplicate equipment would be required. Furthermore, there is a probability that road-engine service between Buffalo and Yonkers will soon be divided into two divisions instead of three as at present. This would transfer the first junction point from East Syracuse farther east to Utica. Manifestly, it would be impracticable to operate a section of electrified terminal line in such a long run unless absolutely necessitated by such a serious obstruction as the Detroit River tunnel. But whatever means are adopted now for the relief of the grade-crossing situation in Syracuse, these should contemplate the ultimate electrification of the main line in its passage through Syracuse. With this in view, any plan for depression of tracks appears more favorably than elevation, and the city of Syracuse could well afford to accept the smoke nuisance from a depressed cut for some years in order to realize the greater advantages of depression at such a time as main-line electrification comes into effect. The "air rights" could then be utilized and the entire right-of-way of the railroad become available for industrial or civic purposes.



MILWAUKEE CARHOUSE AND STATION—GENERAL VIEW OF CARHOUSE AND STORAGE LAYOUT

New Carhouse and Station in Milwaukee

Old Building, Outgrown and Badly Located for Present Needs, Was Abandoned and New Layout of Double Capacity Constructed

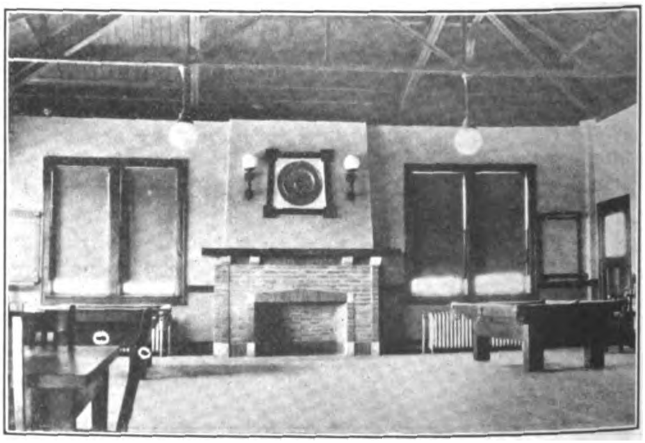
ON March 31 the Milwaukee Electric Railway & Light Company formally dedicated its new Oakland station and carhouse with appropriate ceremonies under the auspices of the Employees' Mutual Benefit Association. The opening of the new carhouse marked the change in headquarters of six city lines from the old Farwell Avenue car station to the new Oakland station. It had been found necessary to increase the housing and storage facilities for the northeast section of the city in order to take care of the growth of the company's business and the additional facilities necessary for fifty new center-entrance cars under construction. The Farwell Avenue station was built about thirty years ago and was located on one of the principal car lines. All switching, therefore, into and around the station had to be done out on the main line. This interfered rather seriously with regular schedules and caused some unfavorable comment on account of delays which resulted. The building was also badly in need of repair and this, together with the fact that its location was no longer at the most desirable point to serve this section of the city, made it seem advisable to construct an entirely new layout.

The new location was selected for its convenience to the several lines to be served and for the particular facilities it offered for the needs of the trainmen. It will remove many of the trainmen from the more crowded sections of the city and will bring them to the outskirts, where there will be an opportunity for them to live under better conditions and perhaps purchase homes of their own. In this connection many inquiries have already been made to the company building and loan association regarding assistance in building new homes. The new station is on Oakland Avenue, near the end of the Oakland Avenue car line and near the Center Street crosstown line, which extends entirely across the city from east to west limits. This makes access to the carhouse possible with a small amount of dead mileage from the six lines to be served.

CARHOUSE CONSTRUCTION

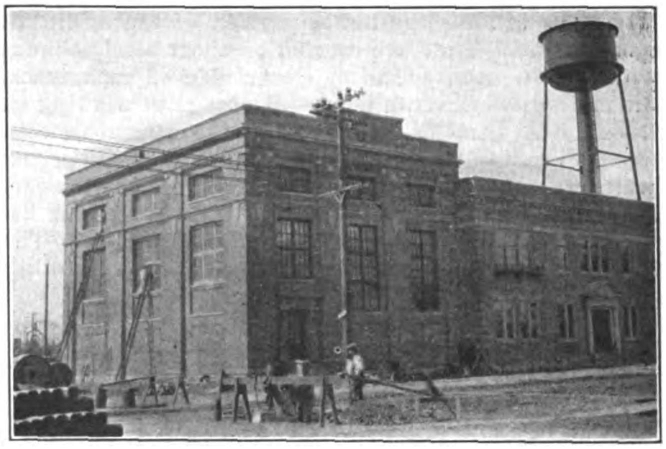
The carhouse and track layout is very similar to the Fond du Lac carhouse constructed in 1913 and described in the ELECTRIC RAILWAY JOURNAL for March 15, 1913, page 497. The building is of sufficient capacity to house approximately one third of the cars which will operate out of this division. The entire layout will provide open and closed storage space for approximately 150 cars, the building being intended to house only those cars which are going through on the regular schedule for cleaning and inspection work. For this purpose four tracks are covered in the new building at the present

MILWAUKEE CARHOUSE AND STATION—RESTAURANT ON MAIN FLOOR OF TRAINMEN'S BUILDING



MILWAUKEE CARHOUSE AND STATION—EMPLOYEES' CLUB ROOM AND DANCE HALL time, but the contract is already let for the construction of an additional bay to the north of the present building and covering four more tracks.

Besides the four tracks under cover in the present layout, there are ten tracks for open storage extending through the yard and stub-ended at the back. As soon as further filling can be done, each of these tracks will be connected to a loop track across the rear end of the property and extending along the south side to connect with the Oakland Street line. When this is completed, it will make possible the movement of cars into and out of the yard from either end of any track, and thus greatly facilitate car movement during the rush periods. The layout is arranged, as seen from the accompanying plan, so that all switching and maneuvering of cars in the yard can be done without the necessity to run out onto the main line in front of the property, and thus any delay from this cause is avoided.



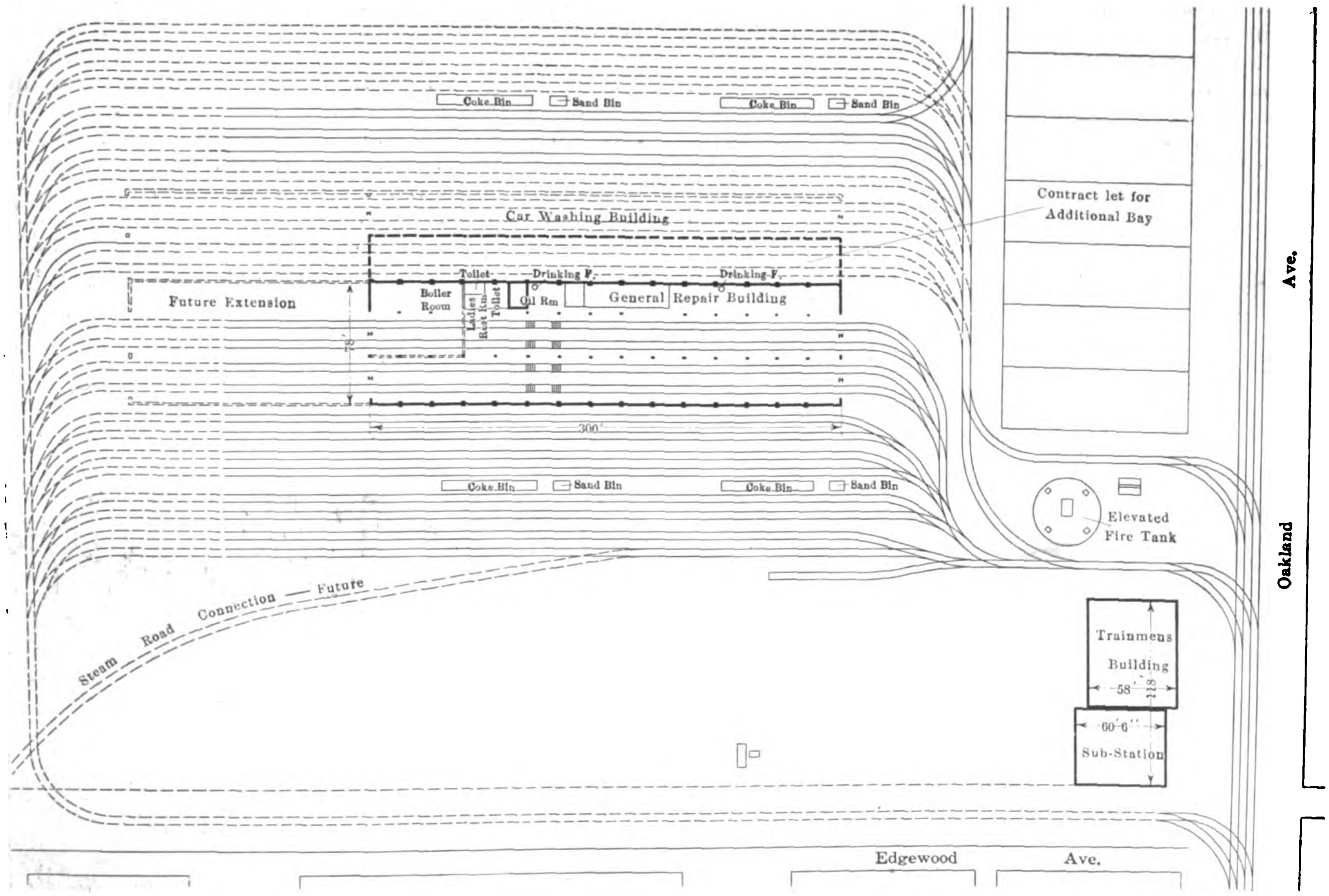
MILWAUKEE CARHOUSE AND STATION—SUBSTATION AND TRAINMEN'S BUILDING

GENERAL REPAIR BUILDING

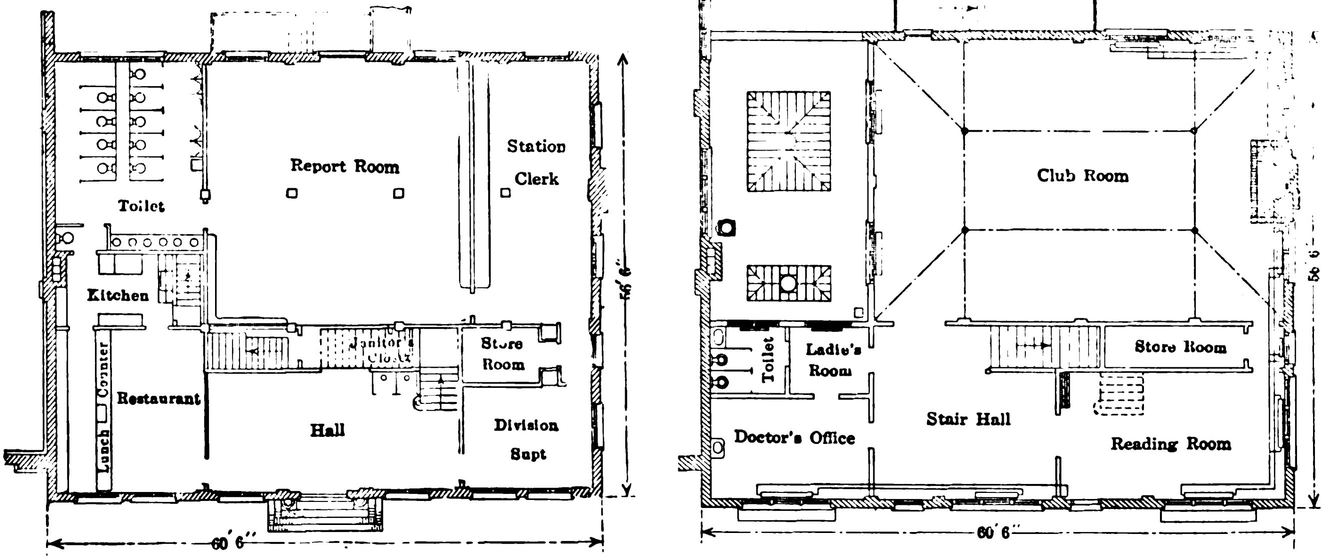
The present carhouse building is 300 ft. long and 80 ft. wide, and is constructed entirely of reinforced concrete. This type of construction was made necessary from the fact that the ground on which the building is placed had for some time been a city dump and, having previously been a deep ravine, was filled with all manner of rubbish which formed a very poor footing for a building. Pile construction was considered, but it was feared that the ash content of the filling might have a deteriorating effect upon the wood and make the construction uncertain. Hence the building was placed on sixty-four reinforced concrete piers averaging 16 ft. in length, some of them being as long as 30 ft. These were constructed by excavating a square hole down through the fill to the original grade, and on down to solid clay bearing. Footings for these columns were made 7½ ft. square on the average and the columns themselves were cast about 27 in. square.

The general design of the present building is shown in the accompanying drawing and photographs. It was designed to serve principally as an inspection shop, and is, therefore, equipped with a suitable storeroom for materials, oil room and two balconies, one used for the lockers for the men, the other as a store place for the heaters in summer and the seats which they displace in winter.

The four tracks in the building are constructed with pits to facilitate inspection and light repairs, and these


Coke Bin
Sand Bin
Coke Bin
Sand Bin
Contract let for Additional Bay
Car Washing Building
Toilet
Drinking F.
Drinking F.
Future Extension
Boiler Room
Ladies Rest Rm
Toilet
Oil Rm
General Repair Building
80'
300'
Coke Bin
Sand Bin
Coke Bin
Sand Bin
Elevated Fire Tank
Oakland Ave.
Steam Road Connection — Future
Trainmens Building
58'
118'
60'6''
Sub-Station
Edgewood Ave.

MILWAUKEE CARHOUSE AND STATION—GENERAL LAYOUT OF CAR STORAGE YARD, SHOWING GENERAL REPAIR BUILDING, TRAINMEN'S BUILDING AND SUBSTATION pit tracks are for the major portion of the open-type construction. They are carried on short steel columns with a 2-ft. open space on either side of each track, which gives workmen a better advantage in working on trucks. A 4-in. slab of reinforced concrete between tracks is carried on 6-in. I-beams, which are supported between the track columns. As the rail used in the carhouse is all 7-in. 95-lb. T-rail, this brings the walk between tracks 3 in. below the level of the rail top. The floor of the carhouse at entrances and at points other than over the open-pit construction is on the same level as the top of the rail and the slab between tracks is tapered up to meet this level where the two floors join.



MILWAUKEE CARHOUSE AND STATION—FIRST AND SECOND FLOOR PLANS OF TRAINMEN'S BUILDING, SUBSTATION UNDER CONSTRUCTION ADJOINS AT THE LEFT IN THE ILLUSTRATIONS

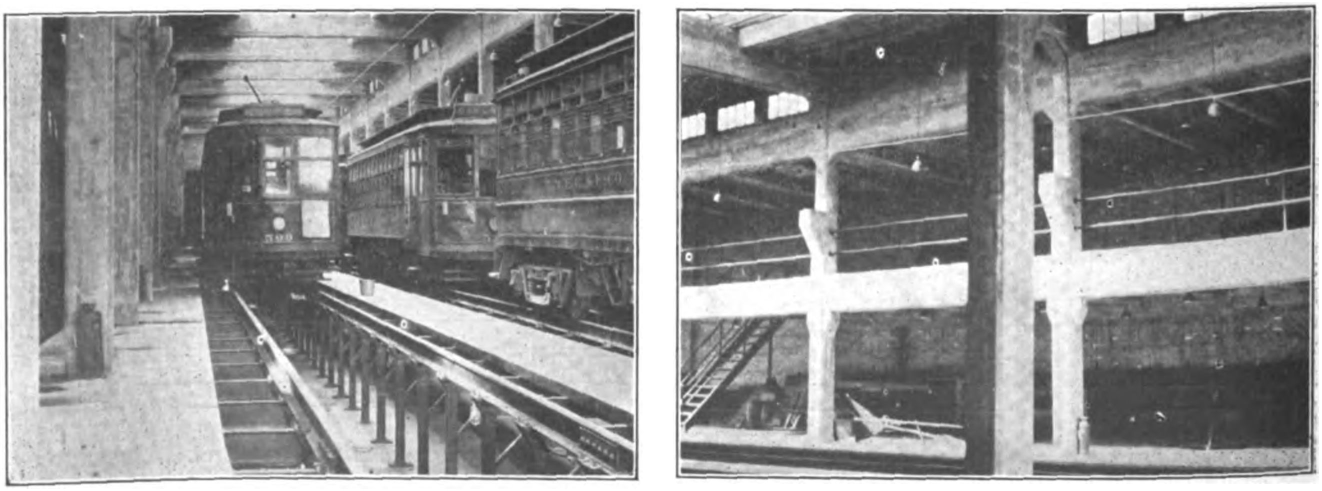
A skylight over practically the entire length of the main bay of the carhouse and five short lateral skylights over the length of the present building in the other bay make the building interior very bright, and expedite the work of inspection and maintenance. Rolling steel doors at the car entrances, rolling steel firedoors at all doorways and a dry-pipe sprinkler system with standard hose equipment and hose houses in the yard, all connected with a 60,000-gal. fire tank carried 85 ft. in the air, give a very complete protection against fire.

One feature of the layout is the provision for future extension of the present building either longitudinally or laterally across the plot as needed with the growth of the property and number of cars to be handled. This is clearly shown in the drawing.

TRAINMEN'S BUILDING

At the near corner of the property, which includes an area 806 ft. x 819 ft., the company has constructed a building for the convenience of the trainmen and the activities of this division of the Employees' Mutual Benefit Association. Also, adjacent to this is a new substation, which is now under construction to serve this section of the city. These two buildings are constructed of red colonial brick with Bedford stone coping and trimming. The first floor of the trainmen's building is given over to the division superintendent's office, a general division office and trainmen's room with elaborate toilet and shower bath facilities adjacent, and to a well-equipped restaurant, in which all cooking will be done electrically.

On the second floor is located a large trainmen's club room which is equipped with pool tables and card tables and will also be used for dancing and for meetings of the employees' association. A bronze tablet bearing the emblem of the employees' association is



MILWAUKEE CARHOUSE AND STATION—AT LEFT, INTERIOR VIEW SHOWING PIT CONSTRUCTION; AT RIGHT, BALCONY FOR STORING HEATER STOVES mounted over the fireplace. There is also a smaller room equipped to serve as a reading room for the trainmen. In addition to the rooms described an office is provided for the division doctor on this floor, and a retiring room for women.

The building is very finely lighted throughout with semi-indirect fixtures of pleasing design and finish. It is heated during the fall and spring months from a small heating plant located in the basement of the building, but a heating pipe to be installed between this building and the carhouse will connect the heating system with the two 80-hp. firebox boilers with down-draft grates installed near the rear of the present carhouse building, making it possible to heat the building from the larger unit during the colder months, when it is also necessary to heat the carhouse.

Third Unit Added to Detroit United Shops

Carpenter Shop, Wood Mill, Tin Shop, Lumber Storage and Dry Kiln Housed in Newest Section of Layout

The Detroit United Railway has just moved its wood-shop equipment from the old Monroe Avenue shop to the new wood-shop building at the Highland Park layout, and thus transferred the third division of the mechanical department to the new location. There still remains the construction of the storeroom and office buildings as the fourth unit of the group to complete the extensive new shops which have been in the course of construction for the past four years. The first unit, the paint shop, was built in 1913 and described in the Electric Railway Journal for April 12, 1913, and the second unit, serving as a truck and machone shop, was covered by an article in the Journal for June 13, 1914.

The latest addition to the layout, which houses the carpenter shop, wood mill and lumber storage on the ground floor, and the tinsmith, pattern and cabinet shops and the dry kiln on the second floor, is located closely adjacent to the machine and truck shops, connected with them by a transfer table, the several tracks in the two buildings being on the same line. This location facilitates the movement of work through the shop. A damaged car is brought into the carpenter shop, which is nearest to the track serving the shops, and the body is there lifted off the truck by traveling cranes and placed on horses, while the trucks are run on through the shop, over the transfer table and into the truck shop for overhaul or repair.

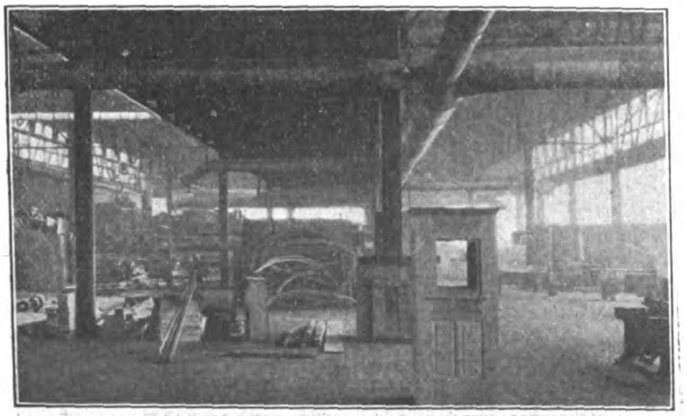
Heading Arrangement of Building

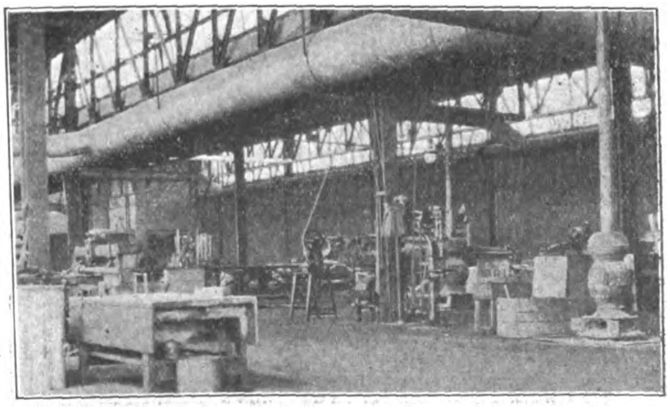
The building is of the same general style of architecture and construction as the machine shop. It is a mill-type building with steel columns and roof trusses on the interior and with reinforced concrete exterior columns, and walls of red brick. The floors are all of concrete and the roof is constructed of concrete slabs, 2½ in. thick and approximately 3 ft. x 7 ft., which were molded on the ground, laid on the steel roof girders and covered over and sealed with a building paper tarred and graveled. Practically the entire east and west side walls and the sides of the monitors are of glass with mechanically operated windows, thus providing good ventilation and making the shop especially well lighted. The artificial lighting is supplied by a system of arc lamps.

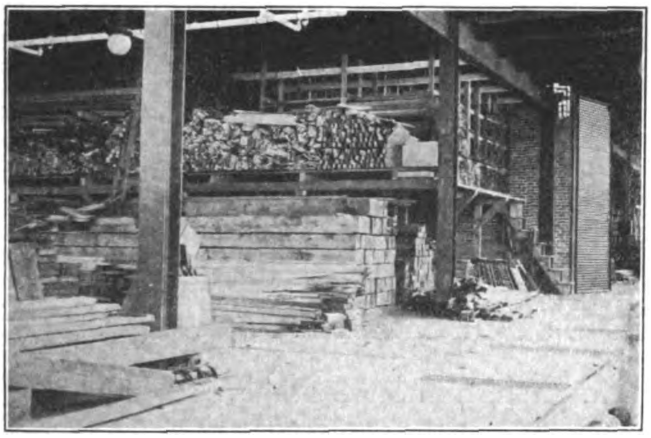
The heating is done by a hot-air system with tunnels under every other track on the ground floor, and 1-ft. x 4-ft. grated openings every 9 ft., which conduct and distribute the hot air throughout the shop. The hot air is supplied to the second-floor shops through an overhead piping system and the heat directed toward the floor at a number of outlets from the air duct. Three large motor-driven fans, one each for the repair shop, wood mill and second-floor rooms, force the hot air through the building from the heating plant, which when completed will be equipped with four 250-hp. Babcock & Wilcox boilers and Murphy stokers. This plant is under construction and will displace a temporary plant which was erected at the time the paint shop was built.

A large electric elevator, 10 ft. x 14 ft., is installed at each end of the wood mill and serves to expedite the movement of trucks of lumber and various material between the shops on the second floor and those on the first. Toilet rooms have been provided at both ends of each floor in the two-story section, and also in the repair shop, for the convenience of the men and so as to save on their time. A general locker and wash room occupies space at one end of the wood mill as seen in the accompanying drawing.

The arrangement of machines in the wood mill has been made so that rough material will come in from the lumber storage room at the north end of the building


DETROIT UNITED WOOD SHOP—CABINET SHOP LOCATED ON BALCONY


DETROIT UNITED WOOD SHOP—TIN AND CABINET SHOPS IN BALCONY



DETROIT UNITED WOOD SHOP—LUMBER STORAGE

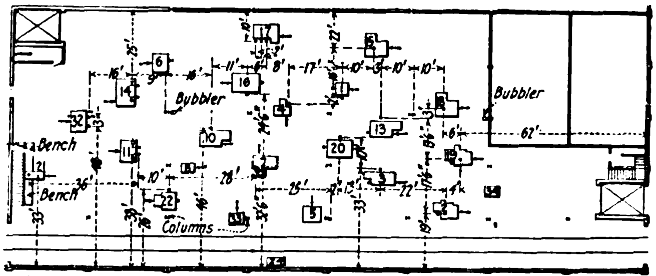
and progress naturally toward the south end of the mill and back again to the first end on its course through the cross-cut saw, rip saw, jointer, planer, etc., to the layout man. The layout of the various machines is shown in an accompanying drawing. Each machine is individually driven by a constant-speed Reliance 600-volt direct-current motor, in some cases by belt drive and in others by direct connection. The latter plain was adopted wherever conveniently possible, and the control in all cases is through a start and stop push button mounted on the machine at a point convenient to the right hand of the operator. All belts are guarded by pipe rails inclosing the moving parts and all motor wiring is carried in conduit.

The shop is made less noisy and the installation of machines and the work in the shops generally facilitated by a creosoted wood block floor which is laid on top of the concrete. A standard gage track extending through the building at the west wall, permits of carload delivery of lumber or various materials from steam-line connections directly into the shop. On the opposite side of the mill, seven rolling steel doors, which are normally raised but which close automatically in case of fire, separate the mill from the carpenter repair shop.

LUMBER STORAGE

The lumber storage room at the north end of the building is fitted with a plank floor in the aisles between lumber piles to facilitate the trucking of lumber to the mill. Special shelves on a balcony in this room are used for the storage of molding, side posts, sash rests and various trimmings which are made up ahead during slack times. There is also storage space in this room for the various car body templets. No heating is provided in the lumber room. It has a total capacity of about 200,000 ft. of lumber, which is sorted and piled according to size and kind of wood, thus expediting the selection of any desired piece.

The capacity of the dry kiln is also about 200,000 ft. of lumber. The kiln is fitted with an open-type floor constructed of 2-in. x 6-in. planks laid on edge and supported several inches above the concrete floor. This flooring is made in sections so that it may readily be taken up and replaced in case it is necessary to get below the floor at any point. Two planks separated by blocks are fastened together, thus allowing the room to be heated by ten sets of steam pipes of thirteen pipes each which extend beneath the flooring from headers on the north wall to the opposite side. Vacuum and pressure gages mounted on the walls just outside the room provide a means of determining the conditions inside without the necessity of opening the kiln. A special method of admitting air to the kiln is provided by a number of 2-ft. square ventilation holes left in the concrete floor and closed off by galvanized-iron covers.

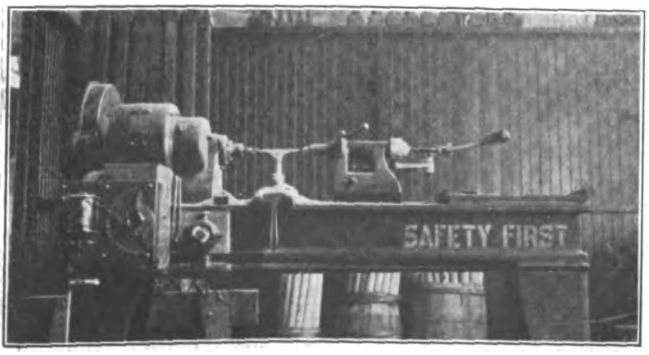


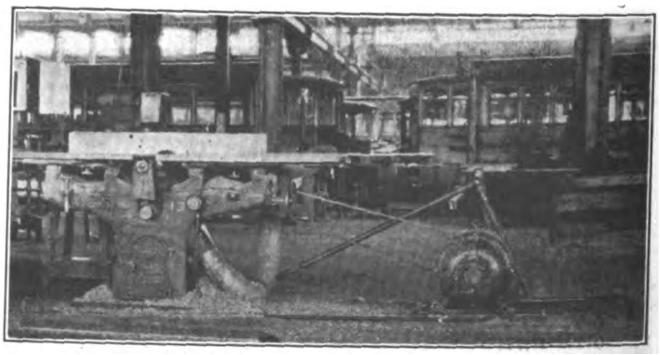
→ Arrows in Front of Machines show the Direction of Feed. • Circles show Position of Helper.

DETROIT UNITED WOOD SHOP—ARRANGEMENT OF MACHINES IN WOOD MILL

1. Planer
2. Rip saw
3. Jointer
4. Band saw
5. Mortiser
6. Mortiser
7. Band saw
8. Jig saw
10. Universal wood worker
11. Shaper
13. Jointer and driller
14. Tenoner
15. Double saw table
16. Sander, 3 drum
17. Molder
18. Double saw table
19. Single saw table
20. Planer
21. Swing saw
22. Planer
24. Double end emery wheel
32. Shaper
33. Boring machine
34. Jig saw

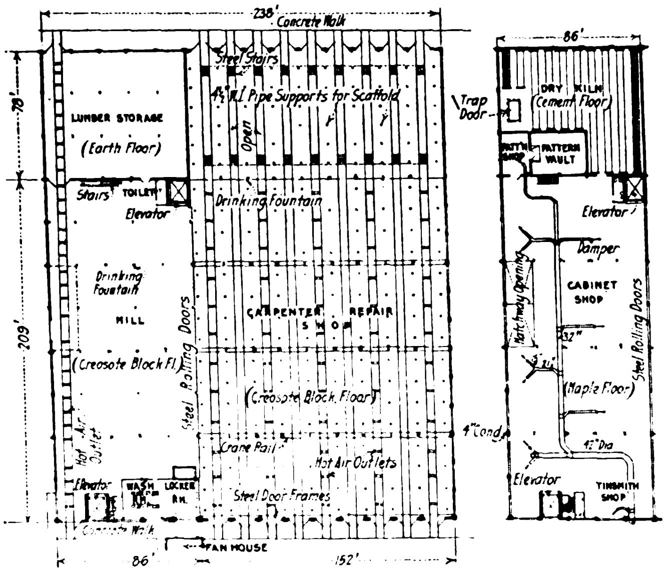
At the west wall in the dry kiln and over the track extending through the building on the ground floor a 6-ft. x 12-ft. opening has been cut to allow the hoisting of lumber from a car directly into the dry kiln, and while no provision has as yet been made for handling lumber in the kiln mechanically, there probably will be occasion for installing a monorail or other hoist system in the future. This opening in the floor is closed off by a trap door constructed of 2-in. x 4-in. boards laid on edge and bound by a steel band, forming a very heavy door. The door is counterbalanced by two concrete weights and the pulley system so arranged that only half the weight of each counterbalance is brought into play from the vertcal position of the door to within about 2 ft. of its closed position, and from there down the door must be closed against the full weight of the counterbalances. This is accomplished by placing a stop in the cable supporting the weights so that the





DETROIT UNITED WOOD SHOP—VARIABLE-SPEED WOOD LATHE, AT LEFT; TYPICAL MOTOR AND BELT DRIVE, AT RIGHT pulley block is lifted directly at the same rate as the cable instead of at half the rate.

The space on the balcony over the wood mill is occupied by the tin and cabinet shops. This is also closed off from the carpenter repair shop by seven rolling steel doors, which are normally kept closed. A small pattern shops opens off the north end of the cabinet shop, and from this a door opens into the pattern storage vault. This will be equipped with steel shelving which, with the solid brick walls, concrete floor and roof and a steel fire door between the vault and the pattern shop, will provide a fireproof storage for the accumulation of company patterns.

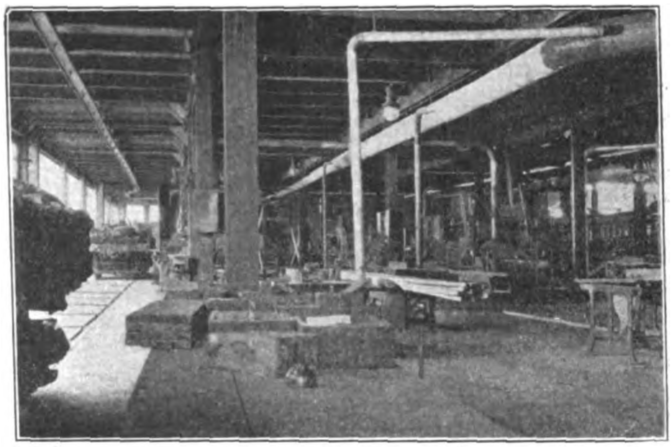

238'
Concrete Walk
Steel Stairs
4½" W.I. Pipe Supports for Scaffold
Open
LUMBER STORAGE
(Earth Floor)
78'
Stairs
TOILET
Elevator
Drinking Fountain
Drinking Fountain
MILL
(Creosote Block Fl.)
Steel Rolling Doors
CARPENTER REPAIR SHOP
(Creosote Block Floor)
Crane Rail
Hot Air Outlets
Hot Air Outlet
Elevator
WASH RM.
LOCKER RM.
Steel Door Frames
Concrete Walk
FAN HOUSE
209'
86'
152'
Trap Door
86'
DRY KILN
(Cement Floor)
PATTERN SHOP
PATTERN VAULT
Elevator
Damper
Hatchway Opening
CABINET SHOP
32"
(Maple Floor)
Steel Rolling Doors
4" Cond.
42" Dia.
Elevator
TINSMITH SHOP

DETROIT UNITED WOOD SHOP—PLAN OF MAIN FLOOR AND BALCONY

A large Sirocco blower, located on the balcony floor at the end nearest the power plant, is driven by a large Reliance motor and connected with a blower system for carrying all the shavings and sawdust from the various machines over into a storage hopper in the boiler plant.

CARPENTER REPAIR SHOP

The carpenter repair shop has nine tracks extending entirely across the building and the shop is completely served by four 10-ton Shaw cranes, which travel at right angles to the tracks. These cranes are used for lifting car bodies from the trucks and for general hoisting in the body repair work. The installation of these cranes made it impossible to install trolley wires over the several tracks, but the cars are moved under their own power by means of long jumpers, which are connected to the trolley poles by a pole and hook and to the power supply through circuit-breakers located on each column. These circuit-breakers are arranged so that they must be held in while they are in use, thus eliminating danger from contact with a jumper carelessly left with current on. When the trucks are removed from cars and run into the truck shop, they are moved under their own power by the same scheme.

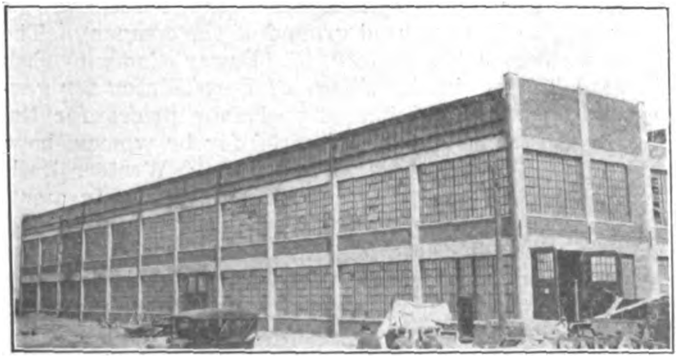


DETROIT UNITED WOOD SHOP—WOOD MILL

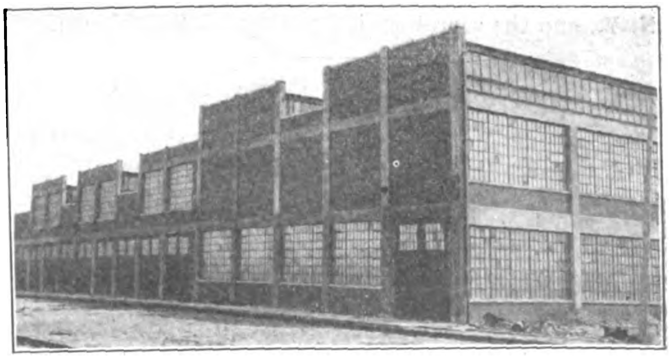
As the cars are repaired and made ready for service, they are gradually worked toward the north end of the building and here each of the nine tracks is equipped with an open-type pit, making it possible to adjust the brakes and do any other work necessary underneath the cars as the final preparation for placing them again in service.

A 3-in. compressed-air main extends across the west side of the carpenter shop and branches from this are carried under each crane runway and an outlet installed on each column for the operation of the various air tools in the course of the repair work. A four-panel switchboard equipped with circuit-breakers and knife switches, installed at the south end of the shops, controls the several cranes and the column circuit-breaker leads throughout the shop. All tracks in the shop are supplied with steel posts and adjustable scaffold supports located about 12 ft. apart for facilitating any repair work which may be required on the upper part of the car bodies.

The United States Bureau of Commerce states that in addition to 1000 copies of the National Electrical Safety Code which have been distributed to commissions, state officials, inspectors and persons interested in its preparation, nearly 10,000 copies have been sold. The Bureau of Standards is preparing a supplementary publication upon the scope and application of the code which is expected to be of considerable assistance to administrators as well as to officials of electrical operating companies and others.



DETROIT UNITED WOOD SHOP—WEST SIDE OF BUILDING



DETROIT UNITED WOOD SHOP—NORTH END OF BUILDING

Increased Coasting in Brooklyn

The motormen who are operating the New York Municipal subway cars in Brooklyn, N. Y., are displaying keen interest in the Rico coasting recorders recently installed on these cars. The original equipment consisted of 300 recorders and six terminal clocks, but it has been found necessary to install four additional clocks.

As an illustration of what has already been achieved through conscientious effort the following statistics are given:

On Feb. 13, shortly after the recorders were put into commission, the lowest individual coasting record was 21 per cent; on March 16 it had risen to 34 per cent. The highest record made by one of the three lines using the recorders on Feb. 13 was 37 per cent, whereas the lowest record by a line on March 16 was 41 per cent.

Motormen who have low coasting records are thoroughly instructed by the supervisors as to how to increase their efficiency and the improvement effected by such instruction has been considerable.

Comparative figures are not available, but there is every indication that the installation of the coasting recorders will result in a substantial saving in power consumption.

The Engineering Foundation and the National Research Council

The secretary of the Engineering Foundation, the inauguration of which was described in the issues of the ELECTRIC RAILWAY JOURNAL for Jan. 23, 1915, page 188, and Jan. 30, 1915, page 237, has presented to the foundation a report on the origin, foundation and scope of the National Research Council. The Engineering Foundation is organized to administer a fund donated to promote research work, and at present all of its income, including a special gift from the founder, is being devoted to the work of the Research Council. The purpose of this council, which now comprises nearly fifty eminent scientists, is to mobilize the research facilities of the country, and to this end it is acting in close cooperation with the Council of National Defense which has been constituted by act of Congress. The Council of National Defense has in charge the investigation, coordination and mobilization of all the means of transportation of the country, and the continuation of the work of the Committee on Industrial Preparedness of the Naval Consulting Board, all having preparation for war as the keynote. The National Research Council has made its first report to the President of the United States, who earlier expressed gratification at the preliminary report of this organization and promised active co-operation.

The Engineering Foundation is administered under the auspices of the United Engineering Society, with headquarters at 33 West Thirty-ninth Street, New York, N. Y., and the secretary is Dr. Cary T. Hutchinson.

Public Utilities in Costa Rica

There is one tramway system in the Republic of Costa Rica, namely, that operated by the Costa Rican Electric Company. This is a British concern, its securities being quoted on the London Stock Exchange. In 1915 this line carried 1,809,823 passengers. The line traverses the city and suburbs of San José and operates extensions to San Pedro del Mojon and Guadalupe. It is stated that this company and other public utility properties in and about San José were to have been acquired by New York interests, but this transfer of control has been abandoned for the time being at least. On Dec. 31, 1915, thirty-four cities and towns had electric lighting facilities and eighty-eight cities, towns and villages had water supply.

Railways Prepare for War

Steps Taken by Several Companies to Assist in National Defense

WOMEN EMPLOYEES IN SHEFFIELD

The Sheffield Corporation Tramways of Sheffield, England, have now in service 900 women out of a total staff of 2000. Of the remaining 1100 all but a few are discharged soldiers or men unfit for arduous work. According to a clipping from the *Sheffield Daily Telegraph* the buses and trams are to-day carrying 43 per cent more passengers than when the war broke out.

It is not only as conductors that the women are being employed. There are now women inspectors, clerks, timekeepers, cleaners and cashiers. Two depots are entirely "manned" by women, and their work is considered excellent. Although service in the tramway department is arduous, demanding long hours, defiance of weather conditions at their worst, and a good temper that may be relied upon never to fail, it is said that the cheerful good humor of the lady conductors is a marked characteristic of the war-time service.

WOMEN ATTENDANTS AT SUBSTATIONS

Although no American railways are yet reported as using women attendants at substations, such a plan is being followed by the American Gas & Electric Company in its property at Dunkirk, Ind. It has there a combined pumping plant and substation with which a residence is connected, and both the regular attendant and his wife are carried on the company's payroll. The duty of the male attendant embraces work on the local distribution system, such as testing meters, repairs to services, repairs to the street lighting system, etc. During the absence of the male attendant, the wife is on duty at the pumping plant and substation. The company has found this plan so successful that it has been introduced into substations at Jonesboro, Hartford and other places in Indiana.

UTILIZING WASTE GROUND FOR CULTIVATION

Notes have appeared in previous issues of this paper on the plan to develop for cultivation unused ground owned by electric railways now on the right-of-way or held for the erection of carhouses or other buildings. Companies which have already been mentioned in this connection are the Alton, Granite & St. Louis Traction Company, the East St. Louis & Suburban Railway, the Illinois Traction System and the Connecticut Company. During the last week the Pennsylvania Railroad has posted notices that the employees of that system will be permitted to farm unused ground of the company. The Northwestern Ohio Railway & Power Company has donated 150 lots in the village of Port Clinton for gardening purposes and has offered four prizes for the four best gardens made and cared for by women, boys and girls. The Delaware, Lackawanna & Western Railroad has also issued a circular letter calling farmers' attention to the help which the Lackawanna Railroad can give them in three general lines, namely: Help in guaranteed quick transportation of perishable consignments to markets; help in securing and bringing to the farms harvest labor from distant points, and help in establishing a system for selling products in towns to the farmers' advantage.

COMMUNICATIONS

Preventing Theft of Incandescent Lamps

LOUISVILLE, KY., April 3, 1917.

To the Editors:

The increasing use of the Mazda type of lamp for street railway service is bringing with it an annoyance which in many cases is assuming serious proportions. There has always been more or less loss by theft with the old carbon lamps; but in the case of the Mazda lamps the trouble is increased both because the Mazda lamp is much more desirable and therefore more tempting to the thief, and also because the cost of these lamps to the companies is about double that of the carbon lamps. The result is that the Mazda lamps are disappearing in large numbers from carhouses, shops, etc., where they are in general use, and the companies are facing a loss which is reaching considerable proportions.

Obviously, if these lamps could be made unsuitable for use in homes on the standard voltage, the temptation would be largely removed and the thefts would cease. It would seem practicable to make and market these lamps to operate six or seven in series instead of five. This would mean that the lamps would be rated at about 90 or 80 volts, respectively, which of course would make their use in homes impossible. The additional lamp or lamps in each circuit could readily be taken care of by the use of a twin series plug receptacle, similar to those now used for operating two lamps or devices from one socket in multiple work. These could probably be located in such a way as not to affect the symmetrical arrangement of the car lights to any great extent, and their use would make unnecessary any change in the wiring. ELECTRICAL ENGINEER.

[NOTE. The above letter was submitted for comment to S. E. Doane, chief engineer National Lamp Works, General Electric Company. Mr. Doane's reply is given below.—EDS.]

NATIONAL LAMP WORKS
OF GENERAL ELECTRIC COMPANY.
CLEVELAND, OHIO, April 10, 1917.

To the Editors:

In reference to the use of odd-voltage lamps for street railway service, as suggested by your correspondent, it seems to me that if the railway companies used low-voltage lamps they would simply increase their burden. If burned on the usual lighting circuits these lamps would give a great deal of light, but would be very short-lived. They would be popular because of their brilliancy and a thief would be impelled to come back for lamps again and again.

It would not be possible to make higher voltage lamps and have them sufficiently rugged to give satisfaction.

No demand has been brought to my attention for lamps of non-standard voltage. Of course, any kinds of lamps can be purchased which any customer wishes, subject to delays and expense incident to the manufacture of special lamps. It seems to me that this problem is one of the design of the fixtures rather than of lamps. One of the fundamentals in a problem of this kind is to put the extra expense into the permanent equipment rather than to add it to the incandescent lamp itself which is thrown away when burned out.

S. E. DOANE, Chief Engineer.

Standardization of Car Design

PRESSED STEEL CAR COMPANY
PITTSBURGH, PA., April 16, 1917.

To the Editors:

The article on the subject of standardization of car design, by W. H. Hulings, Jr., vice-president, The J. G. Brill Company, in your issue of Dec. 30, 1916, has been read with a great deal of interest. Mr. Heulings goes into the subject so fully that there is hardly anything that can be added to emphasize not only the advantages which would result but also the difficulties in the road of bringing such an undertaking to a successful issue.

You are no doubt aware of the efforts which have been made during the last few years in the direction of standardizing freight cars, which would seem to be a comparatively easy matter, because such cars are used in practically the same class of service. That is to say, while there are, of course, several types of cars required for different kinds of ladings, each type is in the same service, and it should not be very difficult to standardize each of these types. But comparatively little progress has been made, although the subject has the earnest consideration of the American Railway Association.

If it is so difficult to standardize freight cars, does it not seem reasonable to believe that it will be practically impossible to standardize electric cars for street railways, or for suburban and interurban purposes, on account of the almost immeasurable differences of requirements—not to count personal preferences governing the construction of such cars? Further, it must not be forgotten that the fact that electric cars are very seldom used in interchange makes the necessity less apparent.

Another handicap against standardization is the patent situation. Nearly every constructive feature is covered more or less by patents, the free use of which is not open to the builders, and every new construction covered by patents is generally followed by one or more substitutes which complicates the situation very much.

To ascertain, however, the sentiment among builders and users of electric cars on the subject, would it not be best to lay the whole question before the next electric railway convention, so that if it is looked upon favorably a committee can be appointed with instructions to report in another year.

Such a committee could perhaps see its way clear to make suggestions for the standardization of a number of details generally used on all cars, no matter what the type of the car as a whole may be. This would be a beginning and lead to further efforts in the future. Such procedure would be on lines similar to the work which has been done by the Master Car Builders' Association during the last thirty-five years and which has been very beneficial not only to the railroads but also to builders of cars, even though it has not resulted in making standard cars. CHARLES A. LINDSTROM,
Assistant to the President.

Committee on National Defense

The committee on national defense of the American Electric Railway Association is sending out a bulletin to all electric railway companies with suggestions as to how they can best co-operate in the work of national defense in the present condition of affairs.

The Illinois Traction System arranged a practical demonstration of its automatic block signal system at the University of Illinois electric show, which was held recently in the electrical engineering laboratory of that institution.

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Two-Car Trains for Suburban-Interurban Service

D. U. R. Installs Motor-Trailer Train on Pontiac Division Where Route Requires City, Suburban and Interurban Operation

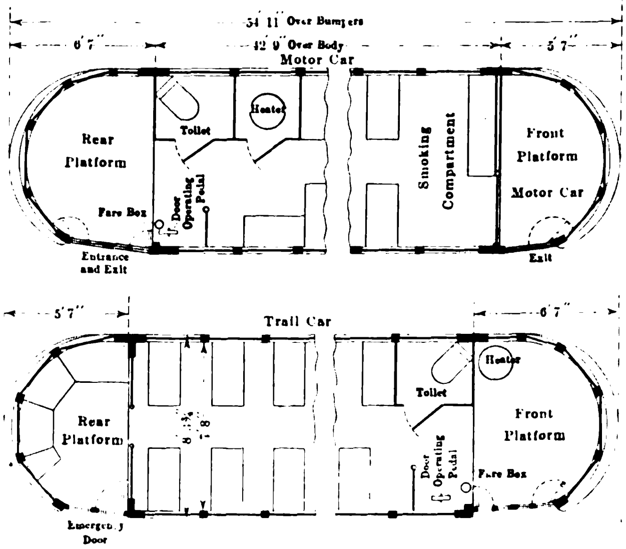
BY H. S. REED
Chief Draftsman Detroit United Railway

Among the recent additions to the rolling stock of the Detroit United Lines are eight trains, each consisting of a motor car and trailer and designed for service on the Pontiac division. One of the features of these trains of more than usual interest is the provision for passengers boarding the motor car or trailer from the same point, or, in other words, the motor car and trailer form a center-entrance train. This arrangement eliminates the delay at stopping points caused by passengers being compelled to run back or forward a car's length in case one car is full.

The service in which these cars are operated is divided into three branches; namely city, with a schedule speed of 10.8 m.p.h.; suburban, with a schedule speed of about 15 m.p.h.; and interurban, where the schedule speed increases to more than 25 m.p.h. The route over which these trains are operated is from the interurban waiting room in Detroit through the center of Pontiac to the terminal point called Oakland, which is located at the northern edge of the city. The distance one way is 25.38 miles. The limiting conditions of this service were determined by a test made on a single car, the results of which governed the design of the cars as well as the selection of the motor equipment.

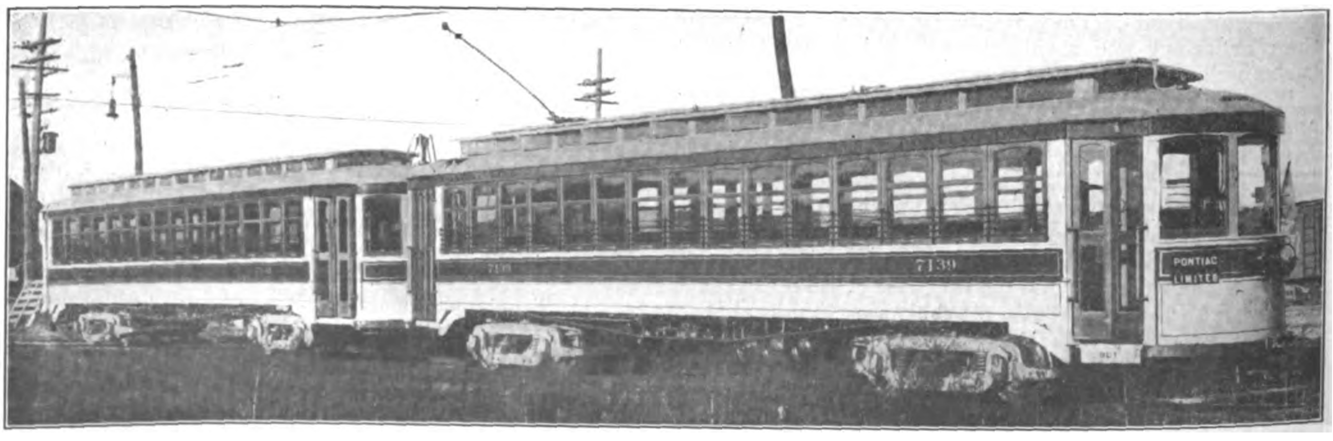
Both motor and trail cars are 54 ft. 11 in. over bumpers and 8 ft. 3¾ in. over sheathing. The drop platforms are given a ramp of 1½ in. toward the open side. The front platform of the motor car and the rear platform of the trail car are 5 ft. 7 in. long, while the rear platform of the motor car and the front platform of the trail car have a length of 6 ft. 7 in. With these exceptions the motor and the trail cars are practically identical in construction. The body length of both is 42 ft. 9 in. and the truck centers 29 ft. 9 in. The trucks are located symmetrically with respect to the entire car, but are off center relative to the body of the car. This arrangement was necessary to prevent the swing of the drawbar from exceeding 63 deg. on the sharpest curve.

The underframe is of steel with outside sills of 3-in. x 4-in. x ⅜-in. angles, the 4-in. leg being vertical and reinforced with 12-in. x ⅜-in. plates. There are no center sills and the car floor is supported on 4-in. I-beam crosspieces. The end sills are box girders constructed of 4-in. channels with cover plates. The necessity of keeping the car floor as low as possible to secure the proper step heights and still allow proper clearance for the multiple unit equipment underneath produced this shallow underframe, which was further strengthened by the use of 1½-in. truss rods.

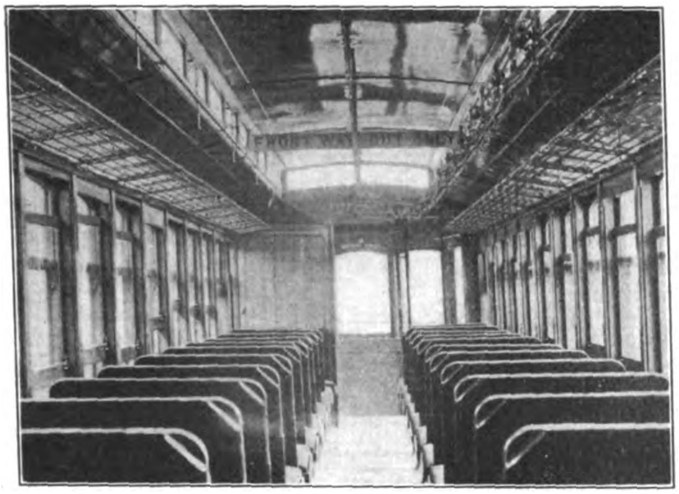


FLOOR PLAN OF MOTOR CAR AND TRAILER

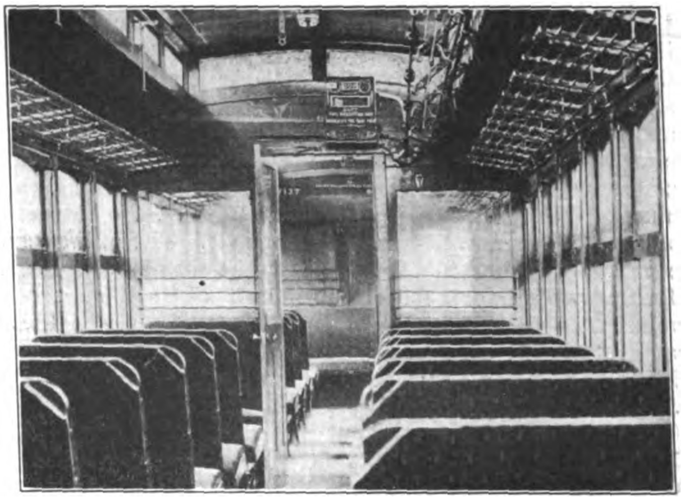
The body is of wood with concave and convex panels. There are fifteen windows on a side, the upper part being stationary and the lower part arranged to raise. A



TWO-OAR TRAIN FOR CITY, SUBURBAN AND INTERURBAN SERVICE



TRAIL CAR INTERIOR ARRANGEMENT



MOTOR CAR INTERIOR ARRANGEMENT

single folding door on the front platform of the motor car is operated manually in conjunction with a folding step and is used for exit only. On the rear platform for entrance and exit are two folding doors connected to folding steps and operated by the National Pneumatic door engines. Both entrance and exit doors open and close simultaneously. The door engine is controlled by a foot pedal at the conductor's position in the rear of the car and also by a rod running along the side of the car.

When operating in the city under the pay-as-you-enter system the conductor stands at the door-operating pedal and collects the city fares as the passengers step into the car. When the limits of the one-fare zone are reached, the conductor collects the interurban fares through the car and may open or close the doors from any point in the car by means of the door rod.

An entrance and exit door is provided on the front platform of the trailer and the arrangement, operation, etc., are in general uniform with the door of the rear platform of the motor car. The rear platform of the trailer is equipped with a single folding door for emergency use only. This door is not operated by an engine but can be unlocked at three different points in the car by means of a rod, and when unlocked may be easily opened by passengers. The interior is one long compartment containing twenty-seven Hale and Kilburn No. 11-A seats and one bulkhead seat. The rear vestibule is also equipped with a row of seats around the inside of the dash affording room for four passengers. All seats are upholstered in dark green figured frieze plush. The seating capacity of this car is sixty.

The motor car is divided into smoking and main compartments. The smoking compartment contains eight of the No. 11-A seats and three bulkhead seats upholstered in dark green leather. The main compartment contains eleven No. 11-A seats and four bulkhead seats upholstered in dark green figured frieze plush. The smoker will seat twenty-three passengers and the main compartment thirty-one, giving the car a total seating capacity of fifty-four, and making the seating capacity 114 for the entire train. In the trailer there is no smoking compartment, passengers being reminded by an inscription on an outer panel near the front door. The toilet room in this car is located in the rear left-hand corner with a heater room just in front of it, while in the trailer the toilet is in the front left-hand corner of the car and the heater is placed on the front platform.

The Peter Smith No. 1-C hot-water heater is used on both cars and on both ends of each Tomlinson air and electric coupling radial drawbars, form 8, 5 ft. long, are mounted. The electric equipment consists of four Westinghouse No. 557-A motors with HL control, which is installed on the motor cars only. The gear ratio is 21:56. The air-brake equipment is Westinghouse AMM with D2EG compressors on the motor car, and automatic brake on the trail car. The train signal device was furnished by the Consolidated Car Heating Company. Both cars are mounted on Standard C-60-P trucks with 6-ft. 6-in. wheelbase and 33-in. rolled-steel wheels, thus providing suitable equipment for installing motors on the trail cars should this become necessary at a later time. The weight of the motor car is 69,840 lb. and of the trail car 45,400 lb., making the weight of one train 115,240 lb.

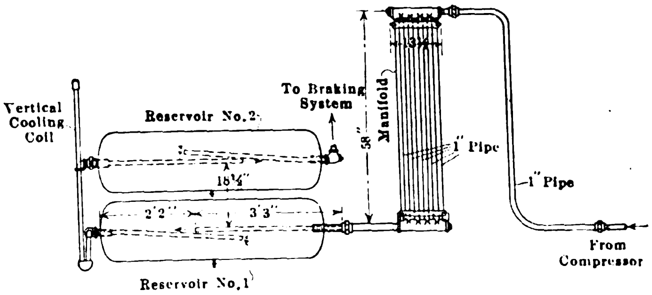
The eight trains have been in operation for several months and have demonstrated that they are able to perform satisfactorily the work for which they were built.

Freezing of Air Brakes Avoided

Pipes Entering and Leaving Main Reservoirs Extended so that Ends of Reservoirs Act as Baffles to Remove Suspended Moisture

BY J. J. SINCLAIR
Assistant Engineer of Car Equipment New York Municipal Railway, Brooklyn, N. Y.

Each winter season brings out different methods of preventing the freezing of the water which condenses in the pipes of air-brake systems of cars. Since most of the moisture will condense where the cooling of the air takes place, it is essential to provide a means of removing this suspended water from the pipes before it is carried through into the air-brake system proper. The diagram shown herewith illustrates how this has been accomplished on the subway cars of the New York Municipal Railway.



PLAN OF AIR PIPING ILLUSTRATING METHOD OF PREVENTING FREEZING

The air coming from the compressor passes through the manifold which consists of five 1-in. pipes connected in parallel between headers. As the air is cooled in the manifold the moisture condenses and is carried along suspended in the air until it reaches the first main reservoir. It will be noticed that the incoming pipe is extended to within 2 ft. 2 in. of the end of the reservoir, which thereby acts as a baffle and removes much of the suspended water. This falls to the bottom of the reservoir, where it is drained off. The outgoing pipe extends beyond the end of the incoming pipe, thus providing for good circulation of air in the reservoir. The air passes from the first reservoir to the vertical cooling coil. Any remaining moisture will condense here and be carried into the second main reservoir, where it is removed as in the first one.

This scheme has worked out in a satisfactory manner during the past winter and is one that could readily be applied to any air-brake system.

Saving Labor on Pole Holes

Use of Explosives Reduces Cost in Soils That Require Loosening—Loading Conditions Not the Same for All Soils

BY J. B. STONEKING, M.E.

Present-day conditions of labor shortage and costs, and the extreme difficulty of organizing and keeping efficient pole line construction gangs, have caused considerable delay in work on line extensions. Where poles must be set in rock, dynamite has long been used as the only successful method of making holes, whereas the use of explosives for making pole holes in material other than rock has grown but slowly.

PREPARING TO BLAST A POLE HOLE; VIEW OF DYNAMITE STICK

Experiments with different soils have shown that what is a good loading practice for one condition does not always hold true for others. It is therefore necessary to shoot a few holes in order to arrive at a correct loading. Better results have been obtained by removing the top earth to a depth of several inches and to the diameter of the pole hole desired before making the bore hole for the dynamite. In making the holes for the dynamite a punch bar driven by hammers, a soil auger with a long handle, or a churn drill are generally used, although one company used a specially made hollow pipe drill that is churned up and down, enough water being used to make a thin mud.

For deeper work up to 6½ ft. very good holes are made by tying small pieces of from one-eighth to one-half cartridge to a small straight lath or stick, starting at the bottom end and spacing them about 6 in. to 12 in. apart, leaving the last piece about 18 in. to 24 in. below the top of the ground. This distributes the charge and packs the earth tightly against the sides, leaving a cavity from 12 in. to 18 in. in diameter. Sometimes the dynamite is inserted into a long roll or cylinder of heavy stiff paper and spaced as with the lath.

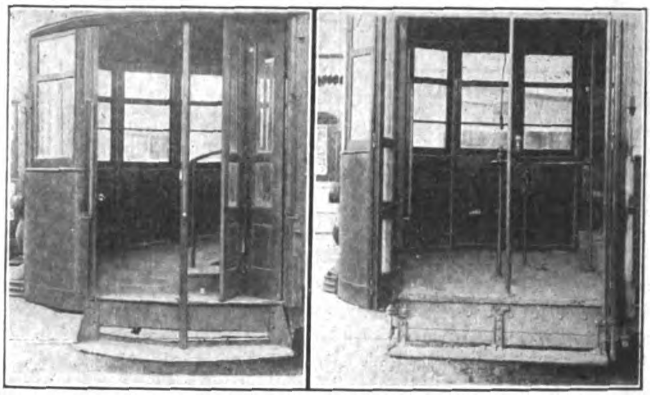
In general, the quicker-acting dynamites make better holes than the slower acting, heaving grades, a 40 to 50 per cent straight grade being used in summer and a 40 to 60 per cent low-freezing extra grade being used in winter when the dynamite may become chilled or frozen.

Ordinarily no tamping is necessary, but for harder material a small amount of tamping has the effect of confining the gases formed in the explosion, thereby creating a greater lateral pressure. Tamping generally results in a bridge being left over the cavity. By varying the size and spacing of the cartridges, and the amount of tamping, the engineer is able in a few trial holes to obtain a system of loading to fit almost any condition.

Surface Cars Remodeled and Standardized at Kansas City

Work Includes Removal of Inclined Platform, Rearrangement of Seats and Redecorating

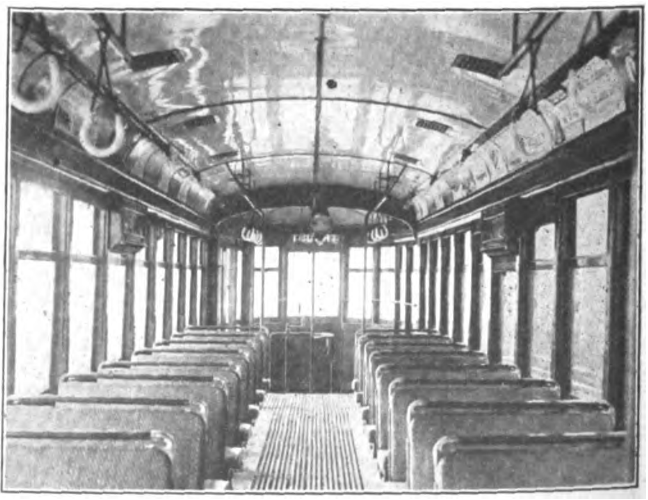
The work of remodeling fifty-one cars of the "900 Series" type by the Kansas City Railways is nearly completed. This is only one of the undertakings to bring all of the company's cars up to standard. The remodeling of other types was described in a recent issue of the ELECTRIC RAILWAY JOURNAL.



REAR PLATFORM BEFORE AND AFTER REMODELING

Included in the work is the replacement of a ramp in the rear by a floor having a 3-in. slope and forming a step with the main floor of the car. Outward folding doors and steps are being installed at the rear and a folding step added at the front. Both the steps and the platform knees are straight in the remodeled car.

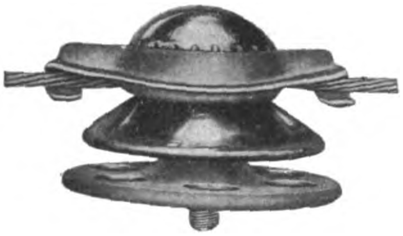
The strap poles and hand straps in the center of the cars are being replaced by sixteen sanitary straps. In the



REMODELED INTERIOR, SHOWING SANITARY STRAPS rearrangement of seats the substitution of longitudinal seats for the last pair of cross-seats at the rear end provides a wide space such as exists at the front. Six stanchions are also being installed. The ceilings are of Agasote, while the exteriors of the cars are being repainted in the standard orange and cream enamel with the company's standard color on the roofs.

Trolley Hanger for High Voltages

The trolley hanger shown in the accompanying illustration has been developed by the General Electric Company, Schenectady, N. Y., for use on potentials of 1200 to 1500 volts. It is known as the Form P suspension. It has a porcelain body into which a stud designed to withstand a force of 3 tons is cemented. There is a malleable-iron yoke for attaching the span wire and a guard of malleable iron under the porcelain body to afford protection against "wild" trolley poles.

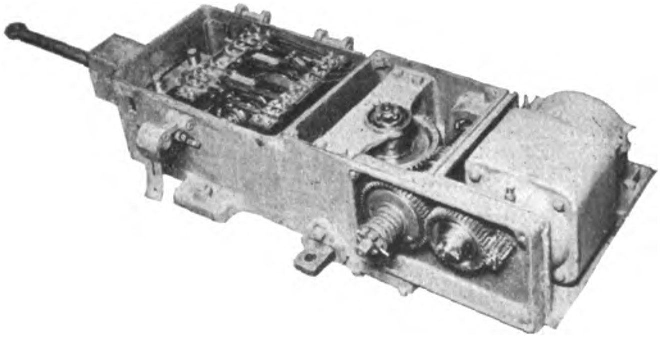


HIGH TENSION TROLLEY WIRE HANGER

Railway Switch and Lock Movement

An electrically operated railway switch and lock movement recently put on the market by the Union Switch & Signal Company, Swissvale, Pa., is shown in the accompanying illustration. This is designated as Style M. By the use of a worm gear for part of the gear train the size and weight of the apparatus has been reduced, and at the same time the worm gear locks the switch against movement caused by external forces.

Between the motor and the worm gear there is a simple disk friction clutch which provides ample protection for the gear train against the shock which might result from throwing the switch against obstructions of any kind. It also serves to absorb the shock on completion of the movement. This clutch maintains a constant coefficient of friction under wide variations in load and is not affected by oil or moisture. The friction disks are made from automobile brake lining material and are easily replaced. The operation of the movement is such that the switch is locked in its normal or reverse position by means of the operating rod as well as by the lock rod.



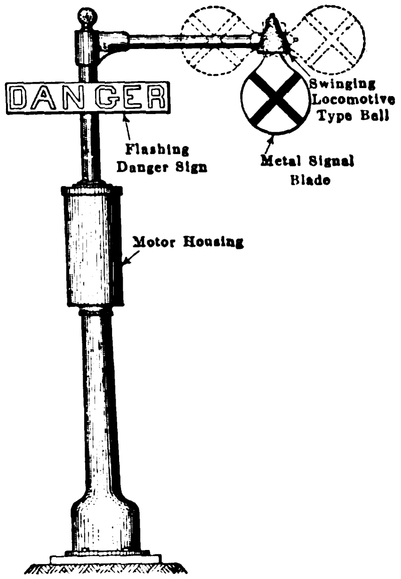
RAILWAY SWITCH AND LOCK MOVEMENT WITH COVER REMOVED

A circuit controller operated by the slide bar is provided for the motor cutout and standard indication circuits. The contacts of this controller are adjusted in such a way that the indication circuit is always disconnected from the source of energy and short-circuited, except when the switch points are in either of their extreme locked positions. A separate point detector attachment may be incorporated in the circuit controller if additional protection afforded by a separate connection to the switch point is desired.

The switch and lock movement can be furnished for operation on high or low voltage direct current, or for alternating current of any standard voltage and at 25 or 60 cycles.

Spring-Operated Crossing Signal with Winding Motor

The track-winding type of crossing signal made by the Hoeschen Manufacturing Company, Omaha, Neb., has been supplemented by a similar signal arranged for motor winding. This was brought out to make possible the installation of the device in locations where the limitations of the track-winding type prohibited its use. A track-winding signal can not be installed at a crossing near a carhouse or shop where the cars, in coming out of the shop and switching back in, would run over the starting mechanism but would not continue on over the winding mechanism. In this case the signal would operate enough times without a winding impulse to completely unwind the spring and leave the signal inoperative. The motor-winding type overcomes these difficulties and has another advantage in that it can be placed anywhere. It is arranged so that the motor winds the spring up faster than the spring unwinds when the wigwag is operating. When the spring is completely wound a cam actuated by a spring operates a switch mechanism which stops the motor. Then when the spring is nearly unwound this same mechanism cuts the motor in and the rewinding is repeated automatically regardless of the train movement.



MOTOR-WINDING SPRING-OPERATED CROSSING SIGNAL

Current for the winding motor can be supplied from a battery by using a low-voltage motor, or from the signal line or trolley supply by using a resistance inserted for a 110-volt a.c. or d.c. motor. A feature of the mechanism is an automatic time stop which may be adjusted so that the signal will operate for a period of from thirty seconds to three minutes and then be automatically stopped. This takes care of instances in which a car enters the block and stops, thus not operating the relay which stops the mechanism.

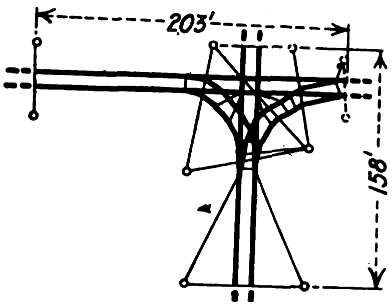
Cost of Erecting Overhead Work—VII

(From the records of a large Eastern company)

The following is the seventh group of a series of diagrams with figures to show the actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. The preceding groups of this series were published in the issues for Jan. 20, page 127; Jan. 27, page 173; Feb. 10, page 260; Feb. 24, page 355; March 10, page 447; and March 31, page 606. The remaining groups will be published in later issues.

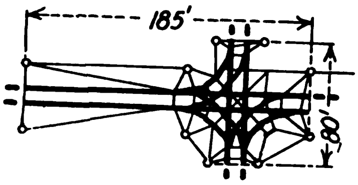
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Double track three-part through "Y," with crossing



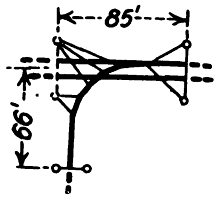
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
46*	$54.45	$39.60	$63.53	$46.20	$72.60	$52.80

Double track crossing double track with three double track connecting curves angle 90 deg.



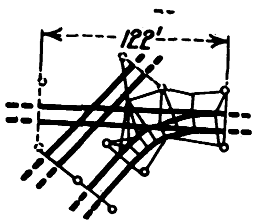
No	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
47*	$72.60	$52.80	$90.75	$66.00	$108.90	$79.20

Single track, left-hand branch-off crossing single track, angle 90 deg.



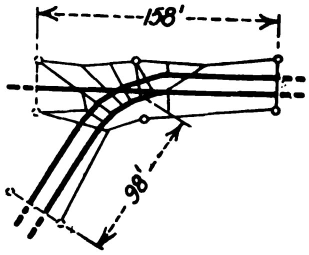
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
48	$15.95	$6.60	$19.14	$7.92	$23.93	$9.90

Double track crossing double track and adjacent to double track left hand branch-off, angle 50 deg.



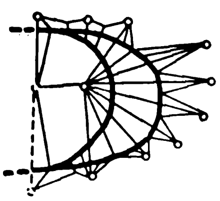
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
49*	$45.38	$33.00	$54.45	$39.60	$63.53	$46.20

Single track left-hand branch-off, single track plain curves, crossing single straight track, angle 60 deg.



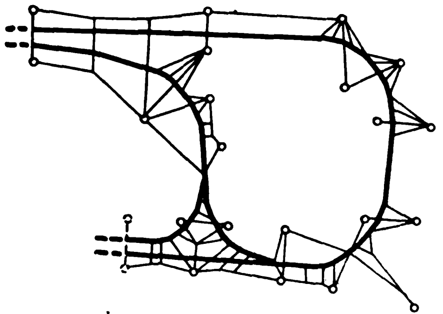
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
50*	$36.30	$26.40	$45.38	$33.00	$54.45	$39.60

Double track loop with single track entrance and exit



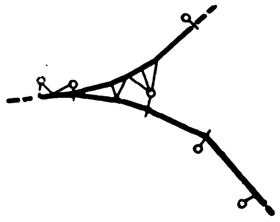
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
51*	$63.53	$46.20	$72.60	$52.80	$81.68	$59.40

Single track terminal loop with single track branch-off connections



No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
52*	$72.60	$52.80	$81.68	$59.40	$90.75	$66.00

Single track "Y" branch-off, angle 90 deg.

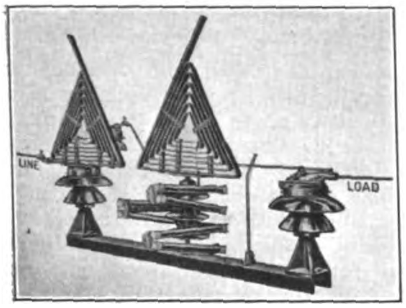


No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
53	$23.93	$9.90	$31.90	$13.20	$39.88	$16.50

*Trucking includes cost of extra reel truck. None of the figures on this page includes cost of superintendence and engineering.

New Lightning Arrester for Heavy Surges

A lightning arrester for use on transmission systems where very heavy surges are experienced has recently been placed on the market by the Railway & International Engineering Company of Pittsburgh, Pa. The arrester is of the Burke series horn-gap type and embodies a reactance coil connected in series with a high-capacity Koppat resistor in the ground circuit.



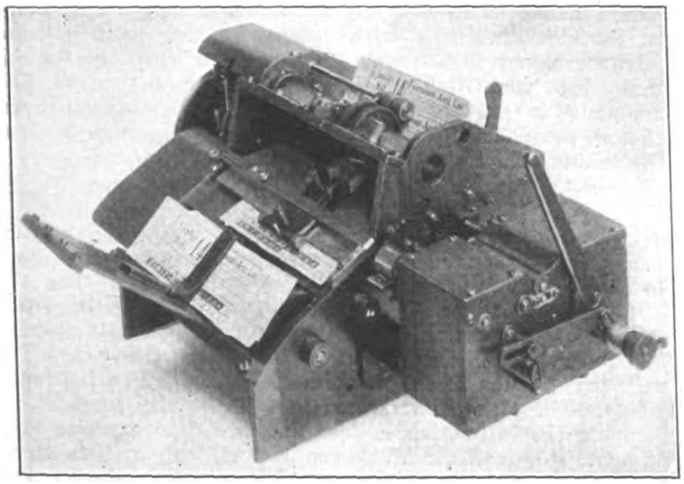
NEW LIGHTINING ARRESTER FOR HEAVY SURGES

An auxiliary gap shunts both the reactance coil and the resistor, giving a straight path to the ground for a surge too heavy to be discharged quickly. The reactance coil aids in limiting the rush of power to ground or between phases in case two or more arresters discharge at the same time, and also relieves the resistor of heavy strains by smoothing out the surge.

Another arrester of the Burke series horn-gap type also using the triangular choke coil has recently been developed. This arrester is not intended for use with heavy surges, but is merely an improvement over an arrester built by the company for some time. It provides improved operation and reliability principally in relieving and discharging the line repeatedly without deterioration, through the use of a different type of Koppat resistor and the increase of the capacity of the resistor by more than 300 per cent. This resistor is shunted by an auxiliary gap connected direct to the ground. In case of discharge across this auxiliary gap the arc formed breaks almost instantly, thus inserting the resistance in the ground circuit in series with the power arc that is broken in the main horn-gap.

Memphis Counts Transfers with Tickometer

Since September of last year the Memphis Street Railway Company has been using a Tickometer for counting all transfers. This machine, according to L. LeMay, the railway's auditor, has brought about not only a reduction in the number of people required for checking trip envelops, but also has speeded up the work and increased the accuracy.



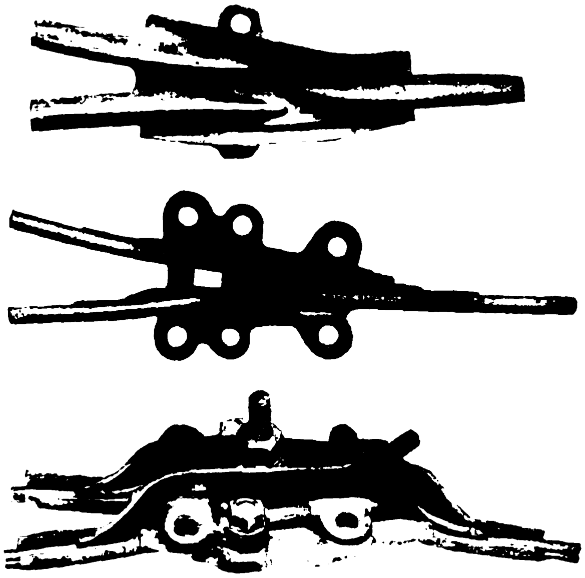
HIGH SPEED MACHINE FOR COUNTING TRANSFERS

The Tickometer is a small motor-driven transfer counting device installed on a table in the auditor's office. On test this machine has counted 800 transfers a minute in actual service in Memphis, and 35,000 to 45,000 transfers are counted in a day by one girl who works eight hours. Transfers are turned in in separate envelops for each trip. The machine is equipped with a total register, and a sub-total register with a reset. It is rented from the Tickometer Company, Cleveland, Ohio, on a monthly basis.

The use of this machine, according to Mr. LeMay, saves the hire of three clerks. In summer months it formerly required the services of five people to count the transfers. Now they are handled by a young man and a girl. The young man opens the envelops, withdraws the transfers and passes them with the envelop across the table to the girl, who feeds them through the Tickometer and checks the conductors' count against the machine count. After checking the transfers they are torn in two and they are later sold for scrap paper.

Trolley Frog with Renewable Wearing Pan

The trolley frog shown in the accompanying illustration is a new design placed on the market by the General Electric Company, Schenectady, N. Y. It consists of two parts, a malleable-iron body and a malleable-iron or composition metal wearing pan fastened to the body by two bolts.



WEARING PAN, BODY AND ASSEMBLY OF TROLLEY FROG

The trolley, span and guy wires are fastened into the body part of the frog. The pan receives all the wear and is easily replaced without disturbing or altering the adjustment of the trolley or supporting wires, since they are fastened to the body of the frog only. Renewals can therefore be made with a very short interruption of traffic. The branch trolley wire can be ended in the body by being clamped under the set screw as shown, or it can be run through the frog and attached directly to the guy wires.

Although the frog is designed for 15-deg. turnouts, by properly locating it with respect to the main and branch lines it can be used for almost any turnout. The weight is only 8 lb., and on account of its lightness the life of the trolley wire immediately adjoining the frog is considerably prolonged.

News of Electric Railways

Traffic and Transportation
Financial and Corporate
Personal Mention
Construction News

Mr. Goodnow at Seattle

Electrification of St. Paul Lines Between Seattle and Othello to Be Directed by Him from That City

C. A. Goodnow, Chicago, assistant to the president of the Chicago, Milwaukee & St. Paul Railway, who supervised the work of electrifying the company's line in Montana and Idaho, recently opened permanent headquarters in the passenger station in Seattle. The Milwaukee will spend $6,000,000 in the work of electrifying the line between Othello and Seattle, work to be completed by Jan. 1, 1919. Between 400 and 500 men will be employed constantly in the work. Engineers who have been in charge of the electrification between Harlowtown, Mont., and Avery, Idaho, arrived in Seattle recently. According to present plans, eight substations will be built. They will cost with their machinery approximately $175,000. The stations will be located at Taunton, Doris, Kittitas, Hyak, at the east portal of the Snoqualmie tunnel, at Cedar Falls, Black River Junction and the Tacoma shops.

Terminal and Power Arrangements

At Seattle it is proposed to electrify the passenger tracks of the company as far as the Stacey Street freight house. At Tacoma the line will be electrified to the passenger station and the yards on the tideflats. Electric current, which has already been contracted for with the Inter-Mountain Power Company, will be delivered on the east from the Washington Water Power Company's plant at Long Lake, 15 miles west of Spokane on the Spokane River, and brought to the substation at Taunton. On the west the electric current will be brought from the Snoqualmie Falls plant of the Puget Sound Traction, Light & Power Company and delivered at Cedar Falls. The Inter-Mountain Power Company, in order to connect the Long Lake and the Snoqualmie Falls power will build transmission lines aggregating 170 miles. There will be delivered at Taunton and Cedar Falls 7500 hp. each, and as the business of the railway increases the contract for this power will ultimately provide for an aggregate of 25,000 hp. Requisitions for the material have been placed with G. F. Wilder, Western purchasing agent of the Milwaukee at Seattle, and contracts for transmission, trolley and other power facilities will be let shortly. Substations of the bungalow type, with attractive grounds, will be built under the directions of R. Beeuwkes, electrical engineer; W. B. Walker, superintendent of construction, and R. E. Wade, assistant electrical engineer.

Mr. Cross Succeeds Mr. House

Thomas A. Cross, who has been vice-president and general manager of the United Railways & Electric Company, Baltimore, Md., on April 12 was elected president of the company and also chairman of the board. He succeeds William A. House in both positions and also succeeds Mr. House as a director. At the same time James R. Pratt, who has been assistant general manager of the company, was elected second vice-president and general manager. H. B. Flowers was appointed assistant general manager to succeed Mr. Pratt. Mr. Flowers was formerly assistant to the superintendent of transportation. William Early was re-elected secretary, John T. Tingle was re-elected assistant secretary, J. T. Staub was re-elected treasurer and N. E. Stubbs was re-elected auditor. Joseph C. France was reappointed general counsel. J. Pembroke Thom was appointed general attorney. Mr. Thom previously held this position. The executive committee consists of Alexander Brown, B. Howell Griswold, Jr., George C. Jenkins, M. Ernest Jenkins and J. H. Aldred. M. Ernest Jenkins succeeded Mr. House as a member of this committee some months ago.

Muskegon Detractor Answered

President of Local Utility Replies to Attack by the City Attorney

John Q. Ross, president of the Muskegon Traction & Lighting Company, Muskegon, Mich., replied recently in a public address to the statements made about the company by City Attorney Sessions in his attack upon the company in connection with the controversy between the company and the city over conditions of the company's street railway franchise, which has until 1931 to run. Officials of the company have previously announced their willingness to enter into negotiations for a new grant, but only on condition that the validity of the present rights of the company to operate be not contested by the city in court. Mr. Ross said in part:

Not All Milk and Honey

"It may be well for the people of Muskegon to remember that the first company owning the street railway failed because its income was not sufficient to maintain it and the property was sold at foreclosure. The second company lost money, and when it was sold to the present company the men who had their money in it received a little more than half of the money invested without having had interest on it while so invested.

"Upon the organization of the present company the common stock of the company was used to raise funds to purchase the street railway, the electric light property and the gas plant. After these companies had been purchased the bond issue of $600,000 was made. You will see from this that the city attorney had not been correctly informed, as his statement that the bonds had been issued to pay for the property does not present the facts.

"In view of these facts, many of them matters of common knowledge to people who lived here at that time, there could be no reliable information obtained by the city attorney which would justify him in failing to give credit to the figures in the investment account of the company as shown in the statement from which he quoted. Neither fact nor fancy justified him in stating that the company earned the equivalent of more than 11 per cent on the original investment.

"This year as a result of the high cost of material it is safe to say that the company will not earn sufficient to pay a dividend to its stockholders, even though most lines of business are unusually prosperous. The stockholders have had to support the property by continually investing additional money in it. The city is fortunate that the majority of the stock is owned by a company which could and did advance money to make up for its lack of earnings for the many lean years it has had. Under the circumstances the company is entitled to at least a fair statement even though the political exigencies of the time seem to demand the taking of action not warranted by the facts."

City Seeks Injunction

The bill for an injunction to restrain the company from using the city's streets for its street railway has been filed in the Circuit Court by City Attorney Sessions. The bill is signed by Mayor Arnt Ellifson. It describes in detail the various ordinances under which the company is operating and relates the negotiations between the city and the company for the Brunswick extension and other improvements. The Mayor has stated that if the city succeeds in securing the injunction it does not intend to exercise this power to stop traffic in Muskegon, but will employ it to force the company to build the Brunswick spur and equip its cars with air brakes and fenders.

Vehicular Tunnel for New Jersey

Public Service Corporation of New Jersey Spends $75,000 on Preliminary Survey

Some time ago Thomas N. McCarter, president of Public Service Corporation of New Jersey, suggested to the executive committee of the corporation that a thorough study be made of the feasibility of constructing and operating a vehicular tunnel between Twelfth Street, Jersey City, and Canal Street, New York. A committee was appointed, and the very best engineering skill was employed. Altogether some $75,000 was expended to determine, as near as might be in advance, whether the construction and operation of a vehicular tunnel would be commercially practicable.

The company's first public announcement of the scope of the work in which it has been engaged was made by Mr. McCarter at a meeting of the Newark Board of Trade, held in the Robert Treat Hotel, Newark, on April 4. The work was financed by Public Service, and was done by a committee consisting of Mr. McCarter, George J. Roberts, Percy Ingalls, Martin Schreiber and Walton Clark, all Public Service officials, assisted by some of the most eminent engineers in the country.

The tunnel recommended by the board is 10,309 ft. long from street entrance to street entrance, 9409 ft. long from portal to portal, and 4495 ft. long from bulkhead to bulkhead. The estimated total cost of construction, at normal prices for labor and material, is fixed at $6,899,000, but it is figured by the engineers that present prices of labor and material would add about about $2,000,000 to this figure. The tunnel contemplated is for vehicular purposes only.

Rhode Island Investigation Prospects

An act creating a special commission to investigate the affairs of the Rhode Island Company was favorably reported in the House on the afternoon of April 13 and was ordered on the calendar to be voted on April 17. It provides that the chairman of the Tax Commission, the chairman of the Public Utilities Commission and the bank commissioner shall constitute the special commission. The commission so created will investigate the company and report to the Public Utilities Commission such changes in the existing laws and conditions as it may find fair and desirable. The Public Utilities Commission is authorized and directed to carry out such recommendations. The State will pay one-half of the cost of the investigation and the company the other half. An appropriation of $20,000 for expenses is made in the bill.

In a report made by the Public Utilities Commission that body says that until a complete investigation is made the company's troubles can never be settled. The report presents the various demands which have been received from the public and the cities and towns for extended service in the way of more transfers and the extension of the 5-cent fare zones. The commission's recommendations follow:

"1. That a complete investigation of the Rhode Island Company be authorized to be made either by this commission, or by this commission sitting jointly with the Tax Commission, or by a special committee appointed for the purpose.

"2. That such investigation shall cover the finances, management, property and mode of operation of the Rhode Island Company, for the purpose of determining whether said company is furnishing to the people of this State a reasonably proper transportation service, and whether the net income of said company is a fair and equitable return upon the property in public service owned and controlled by it.

"3. That such commission shall further determine what modifications, if any, of the rates of fare, or of the transfer system, are just and equitable, and shall order the same to be made.

"4. That such commission shall investigate the matter of the present method of taxation of the Rhode Island Company, including taxes or payments to the State, or to any town or city, and report to the General Assembly on or before Feb. 15, 1918, its recommendations with reference to any proposed modification of such taxes or payments.

"5. That a special appropriation to cover the expenses of such investigation be made."

New York Labor Legislation

Chairman Straus of Public Service Commission Announces Program Will Go Over

Following the strike on the transit lines in New York in August last, the Public Service Commission formulated a plan for the equitable adjustment of differences between operators and employees, with a view to preventing strikes and lockouts. In pursuance of that plan, a series of public hearings was held, in the course of which representatives of labor, representatives of the operating companies and a number of experts representing the general public, gave the commission the benefit of their criticism and advice. In furtherance of the general object the commission planned to formulate legislation for presentation to the present session of the Legislature. Chairman Oscar S. Straus has now announced that the legislative program will be allowed to go over. He said:

"In view of the fact that the country is now at war, and that such a generous disposition prevails on the part of employees and operators, imbued by a high sense of patriotism and a spirit of ready and generous co-operation, the commission entertains the hope that, as a result of this spirit of co-operation, it will follow that an entirely different and more generous relationship between employers and employees will develop. Therefore, the commission has decided not to present any proposed legislation to the Legislature of 1917."

Authority Withheld

The Public Service Commission of Pennsylvania has refused to grant the city of Philadelphia authority to proceed with the construction of the new Broad Street subway, the central delivery loop, the Parkway-Roxborough subway-elevated line, and the high-speed surface line to Byberry. The only favorable action taken was on the extension of the Frankford elevated to Rhawn Street.

George T. Atkinson, assistant director of city transit of Philadelphia, was quoted in part as follows:

"The failure to approve the sections of the new lines, on which bids have been received and opened, means untold delay. However, we must abide by the commission's decision. What the next procedure will be I do not know."

An act has been introduced in the Senate designed to give to the city of Philadelphia full legal authoritiy to operate the city-built, high-speed lines and also to take over the local Philadelphia lines should all negotiations for an operating lease with the Philadelphia Rapid Transit Company fail.

Common User Rights Sought

These Privileges Desired in Effort to Extend the Seattle Municipal Line

An extension of the Seattle (Wash.) Municipal Railway, Division "A," from Nickerson Street and Thirteenth Avenue West to the north city limits in Ballard, and the acquirement of common user rights on Fourth Avenue, between Stewart Street and Jefferson Street, is claiming the attention of Seattle City Council at this time. Last June, in compliance with a request from the Council, A. L. Valentine, superintendent of public utilities, filed a report on Division A and an estimate of the cost of the Ballard extension. The Council, as constituted last year, was not in favor of the extension, and no action was taken on the report. Mr. Valentine estimated the cost of the Ballard extension at $96,213 for a line 3.42 miles long.

Councilman Erickson, as a part of his plan to extend the city railway, Division "A," introduced a resolution at a recent meeting of the Council, by the terms of which the Puget Sound Traction, Light & Power Company would be forced to abandon operation of its Ballard Beach and Ballard North cars over the Fifteenth Avenue N.W. bridge, or grant to the city the right to operate municipal cars over the company's tracks on Third Avenue South and around Jackson Street loop. Heretofore the Puget Sound Traction Light & Power Company has declined to consider common user privileges on the Jackson Street loop because of its congestion.

Seattle Differences Settled

Eleven bills have been passed by the City Council of Seattle, Wash., which settle all differences between the city and the Seattle & Rainier Valley Railway. The bills cover in their provisions the granting of new franchises to the company, including the building of a new line on Genesee Street, the acquisition of common user rights by the city for the municipal line on Fourth Avenue, between Stewart and Jefferson Streets, and the exchange of transfers between the municipal railway and the company. These bills were the result of numerous conferences. By their provisions the franchise of the company is modified as to paving obligations, and the company is granted a franchise on Genesee Street and Fiftieth Avenue South from Rainier Avenue to Hudson Street. The bills also provide for the surrender of certain of the company's franchises. The company is relieved from planking and paving its rights-of-way along Rainier Avenue until such time as the Council decides that the improvement is necessary. Harry W. Carroll, city comptroller, is authorized to pay into court $41,700, representing a judgment awarded to the company against the city.

Increase in Wages in Reading.—The Reading Transit & Light Company, Reading, Pa., on April 1 increased the wages of the motormen and conductors to a maximum of 27 cents an hour from 26 cents. This applies to all the lines of the company in Reading, Norristown and Lebanon.

Constabulary Measure Passed in New York.—By a vote of eighty-one to sixty the Assembly of New York on April 4 passed the Mills-Wells bill creating a State constabulary force similar to that of Pennsylvania. Four troops of forty-five men each are to be provided. The measure was signed by the Governor on April 11.

Stone & Webster Representatives Meet.—Heads of departments, managers of properties, and others connected with Stone & Webster from all parts of the United States convened in Fort Worth, Tex., on March 26, for two days, to discuss problems that confront them. The sessions were executive and took the form of roundtable discussions.

Third Arbitrator May Be Unnecessary.—The questions of wages and working hours between the Detroit (Mich.) United Railway and its union employees may be settled without the aid of a third arbitrator. John A. Russell, arbitrator for the company, and Judge Edward J. Jeffries, the arbitrator appointed by the men, have held conferences, and it is understood they believe that an agreement satisfactory to both sides can be reached without the appointment of a third arbitrator.

Advertising the Cincinnati Election.—The friends of the proposed municipal rapid-transit loop in Cincinnati, Ohio, have resorted to publicity to prepare the public for the vote on the proposition. to be taken on April 17. Opinions of prominent business and professional men on the matter are set forth in the advertising space as well as results that will be attained by the passage of the grant. It is thought that this will have more weight than arguments presented in straight advertising style.

Municipal Men Seek Increase.—Wage increases aggregating $78,000 a year were asked by the platform men of the San Francisco (Cal.) Municipal Railway in a petition filed on April 5. There are 525 platform men who seek raises from $3 to $3.40 a day; 67 track men asked raises from $3 to $3.50 and 30 car repairers asked raises from $3.50 to $4. Timothy A. Reardon, president of the Board of Works, is quoted as follows: "The Municipal Railway is a public utility. As such it should pay its own way. But it cannot pay its own way if it has to bear this extra burden of $78,000 a year. The funds are simply not available."

Man Sentenced for Attempt to Wreck Car.—John Moffo was recently sentenced by Judge E. H. Reppert in the criminal court of Fayette County, Pa., to pay the costs and $500 fine and to serve a period of from four to eight years in the Western penitentiary on a charge of malicious injury to railroads. Moffo was suspected of having placed obstructions on the tracks of the West Penn Railways, Pittsburgh, Pa., on Dec. 27, 1916, which were seen by the crew of an approaching car before damage was done. Claim Agent T. B. Donnelly conducted a vigorous prosecution for the company and when the case was called for trial the defendant entered a plea of guilty.

Obnoxious Missouri Statute Amended.—Governor Gardner of Missouri has signed the bill amending the statute which prohibited a foreign corporation from holding more than 10 per cent of the stock of a company doing business in Missouri. This law was characterized some time ago as a deadener to transportation development within the State. The amendment is expected to do much to encourage new undertakings in the State when conditions have resumed a basis somewhat near normal. At present, however, the extraordinary high prices of all construction material, and the general unsettled condition, will probably prevent the undertaking of any new projects of magnitude.

Strike Dynamiter Resentenced.—Michael J. Herlihy, ex-financial secretary of the subway employees' local of the Amalgamated Association of Street & Electric Railway Employees of America, who pleaded guilty last month to an indictment charging him with setting off a bomb in the Lenox Avenue subway, New York City, on Oct. 25, was resentenced to Sing Sing on April 6 by Justice Tompkins in the criminal branch of the Supreme Court for not less than two years and four months and not more than four years and eight months. Herlihy had been sentenced to twenty years, but later he confessed, implicating four other men. District Attorney Swann recommended the reduction of sentence.

Montreal Committee Studying Railways Here—The members of the Tramway Commission of Montreal, Que., are making an investigation of the street railway conditions in some of the principal cities of the United States. They were in Cleveland during the week commencing April 1. They had previously visited Chicago and Detroit. It is the purpose of this commission to draft a contract between the Montreal Tramways and the city of Montreal to cover a period of thirty-six years. Those in the party are the president of the commission, J. P. B. Cosgrain; C. P. Beaubien, Alphonse Verville, Charles Loredo, A. W. Stevenson, Raymond Beaudry, secretary; Dr. L. A. Herdt, consulting electrical engineer, and Mr. Playfair of the Montreal *Star*.

Bus Offer Amended.—The Fifth Avenue Coach Company operating the buses on Fifth Avenue, New York, made a new bid on April 5 for additional bus franchises, offering to operate 28 miles of new routes, more than doubling its present system. The lines proposed would give the city six north and south bus lines and three lines serving the central part of the city alone, with enough crosstown lines to link the longitudinal lines properly. Many of the new lines could be put in operation within ten days and all within six months. The company has issued an illustrated booklet "Motor Bus Relief for New York's Transit Needs," which deals with the present lines, the lines that are now proposed for operation and the terms which the company is willing to make with the city for operating the lines.

Appreciation of J. L. Willcut.—The April, 1917, issue of the *United Railroads Magazine*, published in the interest of the United Railroads, San Francisco, Cal., contained a two-page review of the life of the late Joseph Lewis Willcutt, and an appreciation of the man, together with a portrait. Mr. Willcutt, among the many other offices that he held at various times, was secretary and manager of the Market Street Railway, San Francisco. Early in 1887 the owners of that line acquired other properties, and Mr. Willcutt assumed the secretaryship and management of them. In 1900, owing to the many demands made upon his time by the rapid growth of the Southern Pacific Company, Mr. Willcutt resigned from the Market Street Railway, and his son, George B. Willcutt, now secretary and comptroller of the United Railroads, was elected to succeed him.

Decision Reserved in Buffalo-Niagara Falls Case.—The Public Service Commission for the Second District of New York, after an adjourned hearing, in Buffalo on March 30 reserved decision on the application of the Pennsylvania and the Delaware, Lackawanna & Western Railroads for permission to purchase the capital stock and the right-of-way of the Frontier Electric Railway paralleling and contiguous to the high-speed electric line which the International Railway now has under construction between Buffalo and Niagara Falls. F. B. Lincoln, general manager of the Erie Railroad, which is the only serious objector to the enterprise, told the commission that he thought a satisfactory agreement could be made by which the Lackawanna and the Pennsylvania could use its line between Niagara Falls and Buffalo. The matter has been referred to previously in the ELECTRIC RAILWAY JOURNAL of Jan. 20, page 135, and Feb. 10, page 262.

Labor in the Toledo Grant.—Prof. William M. Leiserson of the Toledo University appeared before the Street Railway Commission of Toledo, Ohio, on April 5, and argued that provision be made in the community plan, under discussion, for an eight-hour day and a minimum wage for the employees of the railway. He advocated a board, made up of representatives of the employees, the company, and the public, to decide the matter of wages from time to time. Professor Leiserson advocated collective bargaining and also the right of the men to strike and the company to declare a lockout. Notice of a strike or lockout should be given from thirty to sixty days before the step is to be taken. Edward Usher, a member of the committee, and formerly president of the Toledo Federation of Labor, said that organized labor was beginning to look with unfriendliness on arbitration. Professor Leiserson said that organized labor always had to fight for what it got. Few points in the proposed franchise were discussed on this occasion.

Oakland Indeterminate Franchise Questioned.—Paul C. Morf, city attorney of Oakland, Cal., has forwarded an opinion to the president of the Railroad Commission of California to the effect that the resettlement franchise plan adopted at the election last November primarily in the interest of the San Francisco-Oakland Terminal Railways, is defective. He holds that the city cannot impose or confer on the Railroad Commission, a State body, power to make a survey of a public utility as provided for in the amendment, and therefore his opinion is that the city has no right to obtain a valuation from the Railroad Commission in connection with the proposed indeterminate franchises. While the decision may delay the progress of the negotiations in connection with the settlement, it is generally accepted that it is much better that any doubts about the proceeding should be raised at this time rather than later. Mayor Davie of Oakland is proceeding with the details, and has named an advisory committee of seven to prepare a resettlement franchise in accordance with the charter amendments.

Programs of Association Meetings

Railway Storekeepers' Association

The annual convention of the Railway Storekeepers' Association will be held at the Hotel Sherman, Chicago, Ill., on May 21, 22 and 23. The annual meeting of the Railway Materials Association will also be held at the same time and place.

Illinois Electric Railways Association

At the call of C. F. Handshy, president of the Illinois Electric Railways Association, the chairmen of all of the standing committees of that association were present or were represented at a meeting held in Springfield, Ill., on April 5. Plans were laid for the association activities during 1917. The next meeting will probably be held at Springfield, Ill., on May 18, and one of the subjects to be considered will be lightning protection for trolley wire and rolling stock. The data will be prepared by H. A. Johnson of the Chicago Elevated Railways, and John Leisenring of the Illinois Traction System. At a later meeting B. J. Fallon of the Chicago Elevated Railways plans to present an analysis of the wood tie situation as it now affects the electric lines in Illinois. It was also considered desirable to devote one meeting during the year to the subject of safety, and this meeting will be in charge of H. B. Adams, safety engineer of the Aurora, Elgin & Chicago Railroad.

Financial and Corporate

$33,800,000 Utility Financing in March

Increase Over February More Than $15,000,000, Over January More Than $40,000,000 and Over March, 1916, More Than $86,000,000

The record of public utility, railroad and industrial financing for March is of particular interest because of the conditions under which this total of $266,651,575 was placed. For most of the month there was pending as a deterrent the forthcoming Government loan and the loan of $25,000,000 to the State of New York, while the issues actually brought out included the $100,000,000 ten-year loan to the French Republic, the $150,000 000 loan of Canada in the interest of which a special campaign was conducted in the United States, the loan to the State of Louisiana, and other minor offering of political subdivisions.

EXTENT OF FINANCING

Such expressions of sentiment as were made by securities dealers for publication indicated in general that they considered that a condition existed which made advisable an attitude of marking time. Despite this, however, corporate financing for the month was more than $15,000,000 greater than in February, more than $40,000,000 greater than in January, and more than $86,000,000 greater than in the same month of 1916. The loans of $60,000,000 to the Pennsylvania Railroad and $45,000,000 to the New York, New Haven & Hartford Railroad, one long-term financing and the other emergency financing, were considered especially noteworthy on account of their size. Another issue that attracted attention was the $1,250,000 of notes for the Melbourne (Australia) Electric Supply Company, Ltd., referred to more in detail on page 708 of this issue. Of the total of March financing, $155,120,000 was contributed by the railroads and $77,680,000 by industrial corporations, leaving $33,851,575 for the public utilities. Amounts of bonds, notes and stocks issued by railroad, industrial and public utility corporations in March, and for three months, with the totals for each class of corporation, and for each class of security, follow:

March:	Bonds	Notes	Stock	Total
Railroad	$78,050,000	$76,770,000	$300,000	$155,120,000
Pub. utility...	20,787,000	9,100,000	3,964,575	33,851,575
Industrial	22,000,000	24,200,000	31,480,000	77,680,000
	$120,837,000	$110,070,000	$35,744,575	$266,651,575
Three months:				
Railroad	$132,256,000	$132,570,000	$18,051,000	$282,877,000
Pub. utility...	76,685,000	35,264,000	32,436,075	144,385,075
Industrial	130,130,000	80,050,000	105,163,000	315,343,000
	$339,071,000	$247,884,000	$155,650,075	$742,605,075

Approximately $101,992,000 out of the March total of $266,651,575 financing was for the purpose of retiring maturing securities.

DETAILS OF UTILITY ISSUES

The details of March financing as compiled by Dow, Jones & Company, publishers of the *Wall Street Journal*, show the following among the utility issues:

Company:	Security	Rate	Amount
Montreal Tram. & P. Co. 2-yr..........	Notes	6	$5,350,000
Cincinnati Gas & Elec. Co. 1st.........	Bonds	5	1,936,000
United Nat. Utilities 3-yr..............	Notes	6	1,800,000
New Brunswick Power Co. 1st.........	Bonds	5	1,750,000
Duluth Street Ry. gen................	Bonds	5	1,728,000
Erie Lighting Co. 1st s. f.............	Bonds	5	1,650,000
Denver Gas & E. Lt. Co. cum. pf......	Stock	6	1,500,000
Utah Power & Light Co. 1st...........	Bonds	5	1,261,000
Melbourne (Aust.) El. Sup. Co........	Bonds	6	1,250,000
Birmingham Ry., L. & Pr. 2-yr........	Notes	6	1,200,000
U. S. Public Service Co. col. lien.......	Bonds	6	1,200,000
St. Cloud (Minn.) Pub. Serv. 1st......	Bonds	6	1,032,000
New Bruns. Power Co. cum, pf.........	Stock	7	1,000,000
Eastern Wisc. Elec. Co. 1st............	Bonds	5	998,000
Ohio Cities' Gas Co..................	Stock	..	964,575
Arkansas Val. Interurban 1st.........	Bonds	5½	900,000
Jacksonville (Fla.) Trac. Co. 2-yr......	Notes	6	750,000
Southern Public Utilities 1st..........	Bonds	5	703,000
Nat'l Gas. Elec. Lt. & P. ser. B.........	Bonds	6	500,000
Alliance (O.) Gas & P. cum. pfd.......	Stock	6	500,000

Annual Report

Harrisburg Railways

The comparative income statement of the Harrisburg (Pa.) Railways for the twelve months ended Dec. 31, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Gross earnings	$1,015,004	100.0	$914,936	100.0
Operating expenses	$472,894	46.6	$397,392	43.5
Allowance for depreciation	95,476	9.4	93,425	10.2
Taxes, including amount reserved for unsettled taxes	80,000	7.9	78,750	8.6
Rentals of leased lines	157,550	15.5	157,550	17.2
Total	$805,920	79.4	$727,117	79.5
Net earnings	$209,084	20.6	$187,819	20.5
Income from investments	18,797	1.8	16,765	1.8
	$227,881	22.4	$204,584	22.3
Interest on bonds	148,608	14.6	147,957	16.1
Net income	$79,273	7.8	$56,627	6.2

The operations of the company were seriously affected, both by a decrease of revenue and an increase of expenditures as the result of a strike which started on July 16, and kept traffic below its normal amount for about two months. Despite this fact, however, the gross earnings for 1916 showed an increase of $100,068, or 10.9 per cent, as compared to those in 1915, while the net earnings gained $21,264, or 11.3 per cent.

Operating expenses increased $75,502, or 18.9 per cent, the depreciation allowance $2,051, or 2.2 per cent, and taxes $1,250, or 1.6 per cent. The increase in income from investments much more than offset the increase in bond interest, and the result for the year was a net income gain of $22,646 over the $56,627 figure of 1915. After paying a six-months' dividend of 1½ per cent, amounting to $31,500, and taking in the prior balance of $30,926, the balance on Dec. 31, 1916, totaled $78,700.

In regard to the jitney situation, the annual report of the company states that since the beginning of the new year there have been licensed under the city ordinance eighty-eight jitneys, which are operating in competition with the company. As none of these has received a certificate of public convenience from the Public Service Commission, proceedings have been instituted before the commission to compel the operation of unauthorized jitneys to cease, and require the issuance of certificates of public convenience to those, if any, which the commission may decide to be necessary. The matter is now pending before the Public Service Commission, March 10 having been set as the date for the hearing.

Utility Investments Recognized

Maine Has Amended Savings Bank Laws to Make Certain Utility Bonds Legal

The State of Maine has passed a bill amending the law so as to include certain bonds of public utility corporations not heretofore recognized as legal for investment. The amendment reads as follows:

"Savings banks may invest ('I') in the first mortgage bonds of any public service corporation located, wholly or in part, in the states other than Maine, named in paragraph 'f' (New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, Maryland, Ohio, Indiana, Kentucky, Michigan, Wisconsin, Minnesota, Iowa, Illinois, Missouri, Kansas, and Nebraska), engaged in business of producing and distributing electric light and power when they otherwise comply with the provisions specified in paragraphs 'f' and 'g,' provided that the average gross income of said corporation for three years next preceding such investment shall have been not less than $200,000 each year, and the average net income of said corporation for the same period shall have been not less than twice the interest charges on the bonds outstanding secured by such mortgage, and all 'prior liens'; and further provided that such net income for the last preceding year shall have been not less than one and one-half times the interest charges on all the interest-bearing indebtedness of the corporation.

"The net income of the company, as described in this section, shall be its net earnings and income derived from property covered by the mortgage in question after payment of all operating expenses, maintenance charges, repairs, renewals, rentals and taxes, and all guaranteed interest and guaranteed dividends paid by or due from it.

"'J' In the first mortgage bonds of any public service corporation combining business of an electric railroad, light and power company, and an artificial gas company, or any two of them, which otherwise complies with the provision specified in paragraphs 'f' and 'g' and 'i' provided the average gross income of such corporation for three years next preceding shall have reached at least the sum of $300,000 per annum."

Foreign Financing

Two Recent Flotations Affecting Private Enterprises Show Willingness to Help in Enterprises Abroad

In the wake of the stupendous war loans that have been made in the United States to foreign countries there has followed a volume of financing of private undertakings in foreign lands which has been considerable in the aggregate and has in some cases contained elements of variety and unusualness that in their success speak well for the continued financing of properties abroad with American money. One of these issues was the recent small loan to the Melbourne (Australia) Electric Supply Company, Ltd., made through Lee, Higginson & Company.

Soon after hostilities began, the British Government put a ban on the raising of funds in the United Kingdom for financing the needs of corporations at home and overseas, including the British dependencies. The effect of this embargo was reflected in the financing returns of Great Britain for 1916, which showed that out of £585,436,400 raised there in 1916 the utility, industrial and other companies secured less than £10,000,000.

TERMS OF MELBOURNE LOAN

One of the companies that felt it inexpedient to put off capital expenditure, however, was the Melbourne Company. As stated before, this financing involved only $1,250,000, but it was new, an experiment. Still, the offering was oversubscribed within a few hours. Bearing 6 per cent interest, the bonds were offered to yield 6¾ per cent. The bonds are convertible at the option of the holder on thirty days' notice into 7 per cent first cumulative preference shares at par after March 1, 1918, or into the ordinary stock at 150 at any time. For this purpose bonds will be convertible at $5 per pound sterling (being at the rate of £100 preference shares or £67 ordinary stock for each $500 of bonds). An interesting feature of this conversion privilege was the fact that the company is paying cash dividends of 7 per cent on the preference shares and 10 per cent on the $2,313,446 ordinary stock, and has paid at these rates for the last four years. At the time of the loan both classes of stock were quoted in the London market at prices above the rates of conversion for the bonds. Principal and interest are payable in the United States in dollars or in London in pounds sterling at current rate of exchange without deduction for any British or Australian taxes.

Another unusual foreign offering made here recently was that of $15,000,000 of ten-year 6 per cent convertible gold notes of the Central Argentine Railway, Ltd. In this flotation there was a New York syndicate composed of J. P. Morgan & Company, National City Bank, Lee, Higginson & Company, Kuhn, Loeb & Company, Guaranty Trust Company and William A. Read & Company.

This is one of the biggest systems in the world. It comprises 3305 miles of track and the lines out of Buenos Ayres are electrically equipped. An unusual feature in connection with this property is that the company's business is conducted under a perpetual concession and under an amended contract with the Government whereby the railway is entitled, without restriction, to charge such rates as will provide a net earning power of 6.80 per cent on the capital investment recognized by the Government, amount at the present time to more than $250,000,000. This issue was also disposed of quickly.

Cape May, Delaware Bay & Sewell's Point Railroad, Cape May, N. J.—The Cape May, Delaware Bay & Sewell's Point Railroad was sold on April 2, at receiver's sale, to Wilson & Carr, attorneys of Camden, for $55,500, free of all incumbrances.

Chicago (Ill.) Railways.—The directors of the Chicago Railways announce that the full annual interest of 4 per cent on the $2,500,000 of adjustment income bonds will be paid on May 1 from earnings of the fiscal year ended Jan. 31, 1917.

Citizens' Traction Company, Oil City, Pa.—The property of the Citizens' Traction Company was acquired recently by the Municipal Service Company, which is now offering $2,231,000 of first lien collateral trust sinking fund 5 per cent bonds dated March 1, 1917, and due March 1, 1942, but callable, all or part, on any interest date at 103 and interest. The authorized capital of the Municipal Service Company consists of $20,000,000 of bonds, $300,000 of 6 per cent notes, $2,000,000 of preferred stock and $2,000,000 of common stock. Of these amounts there are outstanding $2,231,000 of bonds, $250,000 of 6 per cent notes, $1,100,800 of preferred stock and $900,100 of common stock.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.—The Ohio Utilities Commission has authorized the Cleveland, Southwestern & Columbus Railway to issue its first consolidated mortgage twenty-year, 5 per cent bonds to the amount of $201,836. The proceeds from this issue are to be used to reimburse the treasury for money not secured by the issue of stock, bonds or notes, and other evidence of indebtedness for the period from Jan. 1, 1915, to Aug. 31, 1916.

Cleveland (Ohio) Railway.—The operating revenue of the Cleveland Railway for February was $751,500, an increase of 5.29 per cent over the same month last year. The receipts for the month from the 1-cent charge for transfers were $65,630. Notwithstanding this, the report shows an operating deficit of $45,658, and overexpenditures in the maintenance account of $5,031. The actual deficit was $37,578, and the interest account was reduced from $457,696 to $434,744. The number of rides was 29,560,953, an increase of 4.61 per cent over February, 1916.

Detroit (Mich.) United Railway. — The Detroit United Railway has declared a quarterly dividend of 2 per cent payable on June 1 to stock of record of May 16. This is an increase of one-fourth of 1 per cent over the previous quarterly declaration.

Eastern Wisconsin Electric Company, Sheboygan, Wis.—Paine, Webber & Company, Chicago, Ill., are offering at 95 first and refunding mortgage 5 per cent gold bonds of the Eastern Wisconsin Electric Company dated March 1, 1917, due March 1, 1947. The total authorized issue of these bonds is $20,000,000 and the amount issued $998,000. To retire underlying bonds there have been reserved $3,084,000 of the new issue. The company has authorized $5,000,000 of 7 per cent preferred stock and $2,000,000 of common stock. Of these amounts $1,200,000 of preferred stock and $700,000 of common stock are outstanding. The properties are under the management of Kelsey, Brewer & Company, Grand Rapids, Mich. Paine, Webber & Company are also offering for investment the 7 per cent cumulative preferred stock of the Eastern Wisconsin Electric Company at a price to yield 7 per cent. The organization of the company was noted in the ELECTRIC RAILWAY JOURNAL for March 3, page 407.

Georgia Railway & Power Company, Atlanta, Ga. — The Georgia Railway & Power Company has declared a dividend of 2¼ per cent on its first preferred stock, payable on April 20, to stock of record of April 10. Of the dividend, three-quarters of 1 per cent will be applied to dividends accrued previous to Jan. 1, 1917, and 1½ per cent will be on account of the regular quarterly dividend for the quarter ended March 31, 1917.

International Railway, Buffalo, N. Y.—A petition has been filed with the Public Service Commission for the Second District of New York by the International Railway for authority to issue $1,458,717 of 5 per cent bonds under its refunding and improvement mortgage, and to use $102,000 of said bonds authorized last year.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—The following applications for permission to issue bonds have been made to the Ohio Public Utilities Commission: Youngstown & Sharon Street Railway to issue $667,000 of bonds to the Mahoning & Shenango Railway & Light Company for betterments and extensions. Youngstown & Niles Railway to issue $350,000 of bonds to the Mahoning & Shenango Railway & Light Company for improvements and for refunding purposes. The Mahoning Valley Railway to issue $280,000 of bonds to the Mahoning & Shenango Railway & Light Company. The proceeds of the several bond issues will be used to construct the new Youngstown-Niles line on the south side of the Mahoning River, complete the proposed new carhouse in West Federal Street, purchase new cars, and for like improvements.

Monongahela Valley Traction Company, Fairmont, W. Va.—A quarterly dividend of 1¼ per cent has been declared on the $6,782,037 of common stock of the Monongahela Valley Traction Company, payable on April 16 to holders of record of April 11. This compares with 1 per cent paid quarterly since January, 1916, and an extra 6 per cent in stock in January, 1917.

Netherlands Tramways, New York, N. Y.—G. L. Boissevain, president of the Netherlands Tramways, has sent a letter to stockholders announcing that he has sold to Hope & Company, bankers of Amsterdam, for clients of theirs all of the stock of the Electrische Spoorweg-Maatschappij owned by the Netherlands Tramways, amounting to 14,750 shares, of the par value of 250 guilders each, for a sum, which, after payment of certain obligations of the Electrische Spoorweg-Maatschappij, and of the Netherlands corporation, net the sum of $734,790. The board of directors has directed that this sum be distributed pro rata among the preferred stockholders of record of April 2, 1917, amounting to $48.98 per share. A special meeting of the stockholders of the Netherlands Tramways has been called for May 3 next to vote on a resolution calling for the dissolution of the corporation.

Philadelphia Company, Pittsburgh, Pa.—A syndicate composed of Ladenburg, Thalmann & Company, Blair & Company, Hayden, Stone & Company, Brown Brothers & Company, Montgomery, Clothier & Tyler, and Henry & West is offering for subscription at 99 and interest yielding more than 6 per cent $7,000,000 of Philadelphia Company, two-year 5½ per cent collateral gold notes, dated April 2, 1917, and maturing April 2, 1919. The purpose of this issue is to refund $2,000,000 of collateral trust gold notes due May 11, 1917; to refund $650,000 of funded debt which matured during the fiscal year ended March 31, 1917; to reimburse the treasury in part for capital expenditures made during the year and to provide $3,000,000 for capital requirements.

Poughkeepsie City & Wappingers Falls Electric Railway, Poughkeepsie, N. Y.—The Public Service Commission for the Second District of New York has authorized the Poughkeepsie City & Wappingers Falls Electric Railway to make a new mortgage to the Equitable Trust Company, New York, N. Y., securing an issue of $5,000,000 of 5 per cent first mortgage sinking fund gold bonds, of which $596,000 will be issued immediately in exchange, par for par, for $346,000 of first mortgage 5 per cent bonds due on July 1, 1924, and $250,000 of second mortgage 6 per cent bonds due in 1937. No new bonds have been sold.

Public Service Corporation of New Jersey, Newark, N. J.—The New Jersey Board of Public Utility Commissioners has approved an issue of $2,000,000 of stock at par by the Public Service Railway, controlled by the Public Service Corporation of New Jersey.

St. Joseph Valley Traction Company, Elkhart, Ind.—A new board of directors has been elected for the St. Joseph Valley Traction Company consisting of John W. Fieldhouse, James H. States, H. E. Bucklen, Jr., H. R. Bucklen, E. R. Quigley, Edwin A. Warfield and J. D. Wood. The trustees of the property, James H. States, John W. Fieldhouse and Edward A. Warfield, have called in Bion J. Arnold, Chicago, to study the situation and advise procedure, in the expectation that the business of the company can be materially increased over the 76 miles which it operates out of Elkhart. The property is now valued at $4,000,000 and has been built without the issuance of bonds.

Dividends Declared

Columbus, Newark & Zanesville Electric Railway, Springfield, Ohio, quarterly, 1½ per cent, preferred.

Dayton & Troy Electric Railway, Xenia, Ohio, quarterly, 1¼ per cent, preferred; quarterly, 1¼ per cent, common.

Detroit (Mich.) United Railway, quarterly, 2 per cent.

Kansas City (Mo.) Railways, $2.50.

Manchester Traction, Light & Power Company, Manchester, N. H., quarterly, 2 per cent.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., quarterly, 1½ per cent, preferred.

Nashville Railway & Light Company, Nashville, Tenn., quarterly, 1¼ per cent, preferred.

Newport News & Hampton Railway, Gas & Electric Company, Newport News, Va., 6 per cent, preferred; 5 per cent common.

Philadelphia Company, Pittsburgh, Pa., quarterly, 87½ cents, common.

Puget Sound Traction, Light & Power Company, Seattle, Wash., quarterly, 75 cents, preferred.

West Penn Railways, Pittsburgh, Pa., quarterly, 1¼ per cent, preferred.

West Penn Traction Company, Pittsburgh, Pa., quarterly, 1½ per cent, preferred.

Electric Railway Monthly Earnings

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.						
1m., Feb.,	'17	$146,526	*$113,138	$33,388	$35,650	†$2,262
1 " "	'16	144,233	*97,716	46,517	36,531	9,986
2 " "	'17	306,319	*229,332	76,987	71,410	5,576
2 " "	'16	293,094	*198,878	94,216	73,186	21,030
BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.						
1m., Feb.,	'17	$68,776	*$40,521	$28,255	$18,933	$9,322
1 " "	'16	62,406	*34,185	28,221	17,779	10,442
12 " "	'17	844,757	*475,477	369,280	217,077	152,203
12 " "	'16	791,812	*409,036	382,776	212,841	169,935
CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.						
1m., Feb.,	'17	$102,177	*$68,653	$33,524	$29,700	$3,824
1 " "	'16	96,183	*59,764	36,419	28,570	7,849
12 " "	'17	1,246,829	*844,466	402,363	358,896	43,467
12 " "	'16	1,125,769	*736,168	389,601	356,898	32,703
CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.						
1m., Feb.,	'17	$217,275	*$164,986	$52,289	$66,304	†$14,015
1 " "	'16	198,398	*128,085	70,313	65,761	4,552
12 " "	'17	2,911,408	*1,843,347	1,068,061	810,201	257,860
12 " "	'16	2,671,434	*1,539,328	1,132,106	798,964	333,142
EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.						
1m., Feb.,	'17	$268,158	*$172,293	$95,865	$63,969	$31,896
1 " "	'16	227,472	*136,706	90,766	61,802	28,964
12 " "	'17	3,131,624	*1,913,180	1,218,444	759,411	459,033
12 " "	'16	2,529,856	*1,511,278	1,018,578	754,790	263,788
GRAND RAPIDS (MICH.) RAILWAY						
1m., Feb.,	17	$103,932	*$73,700	$30,232	$17,392	$12,840
1 " "	'16	103,429	*64,435	38,994	14,486	24,508
12 " "	'17	1,305,380	*847,091	458,289	193,341	264,948
12 " "	'16	1,186,079	*831,255	354,824	166,787	188,037
LAKE SHORE RAILWAY, CLEVELAND, OHIO						
1m., Feb.,	'17	$120,326	*$87,189	$33,137	$36,466	†$3,329
1 " "	'16	106,507	*76,660	29,847	36,326	†6,478
12 " "	'17	251,915	*183,116	68,799	72,923	†4,124
12 " "	'16	219,876	*153,479	66,397	72,435	†6,037
LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.						
1m., Feb.,	'17	$54,793	*$51,350	$3,443	$15,444	†$12,001
1 " "	'16	50,574	*39,292	11,282	16,085	†4,803
12 " "	'17	816,699	*579,192	237,507	186,476	51,031
12 " "	'16	745,820	*481,350	264,470	190,732	73,738
NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.						
1m., Feb.,	'17	$23,885	*$23,896	†$11	$7,987	†‡$7,958
1 " "	'16	22,358	*21,698	660	7,985	†‡7,283
8 " "	'17	239,557	*202,625	36,932	63,897	†‡26,588
8 " "	'16	256,775	*205,008	51,767	63,979	†‡11,779
PHILADELPHIA & WESTERN RAILWAY, UPPER DARBY, PA.						
1m., Feb.,	'17	$36,002	$20,495	$15,507	$12,517	$2,990
1 " "	16	33,725	17,628	16,097	12,583	3,514
12 " "	'17	522,913	250,277	272,636	150,488	122,148
12 " "	'16	471,793	227,610	244,183	147,606	96,577
WEST VIRGINIA TRACTION & ELECTRIC COMPANY, WHEELING, W. VA.						
1m., Feb.,	'17	$85,112	*$39,983	$45,129	......	......
1 " "	'16	82,400	*39,601	42,799	......	......
12 " "	'17	986,855	*505,858	480,997	$335,214	‡$155,269
12 " "	'16	914,882	*462,638	452,244	328,526	‡132,471

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

Operating Rules for Wisconsin

Railroad Commission of This State Requires Its Approval on Operating Methods and Specifies Certain Equipment

The Wisconsin Railroad Commission has issued a set of eight operating rules which it considers applicable to all electric railways in the State for promoting safety and adequacy of service. In the announcement the commissioners stated that certain features in the operation of each property may require special treatment, and also that the problem confronting the small road is different from that confronting large roads. They, therefore, prescribed at this time only rules involving few details, but "look forward to a time when a more comprehensive set of standard rules may reasonably be required." The following rules will become effective after thirty days, with the exception of Rules 3 and 4, which bcome effective on Jan. 1, 1918:

Rule 1. Each electric railway operating in the State of Wisconsin shall file with the Railroad Commission its book of rules governing operation of cars or trains, together with a copy of all orders, bulletins or notices now in force modifying or supplementing said book of rules, and shall hereafter file with the commission a copy of changes, modifications and supplements within five days after such changes, modifications and supplements are issued. Before a new rule book is put in force, it shall be submitted to the commission for approval.

Rule 2. Each electric railway operating interurban service shall file with the commission a copy of each interurban official trainmen's time-table, and each time-table issue for the use of the public within five days of the date such time-table takes effect.

Rule 3. Each electric railway shall submit to the commission for approval plans and specifications for such pilots, fenders or life guards as it may desire to install on any car or class of cars, together with a full description of the class and kind of service generally rendered by said car or class of cars. After Jan. 1, 1918, no motor car or locomotive (snowplows and sweepers excepted) shall be operated in regular or special service unless equipped with fenders, pilots or life guards which have been approved by the commission.

Rule 4. Each electric railway operating interurban service shall equip all its main-line switches on interurban track with targets for day indication and, in addition, lights for night indication on or before Jan. 1, 1918.

Rule 5. All cars or locomotives in operation over city, suburban or interurban track shall be under full control at reduced speed prepared to stop on approaching all facing spring-point switches.

Rule 6. All cars operating on interurban track shall carry at least one marker independent of power from the trolley wire showing red to the rear when in service between sunset and sunrise.

Rule 7. Plans and specifications for all new cars to be built or purchased, and plans for the remodeling of all old cars shall be submitted to the commission for approval. Plans and specifications shall show the principal dimensions and weights of car body and trucks; height of main floor and platforms above the rail, with a notation or table showing floor and platform height of all other cars that may be operating on the same railway system; height and dimensions of all steps; location and dimensions of all doors and passageways; method of operation of all doors; location and dimensions of all grab handles and similar devices; location, dimensions and spacing of seats; type, number and location of heaters, air ducts, steam or water pipes, and ventilators; type, location, dimensions and complete description of pilots, fenders or life guards, and of any devices designed to prevent telescoping of cars in collisions; description of braking equipment, including compressors, governors, valves, brake cylinders and reservoirs; location of motorman's valves, and the ratio of braking power to weight of car, loaded and light; and such other features as the commission may require.

Rule 8. Before operating any one-man cars each company desiring to institute such operation shall submit to the commission the plan of operation of the proposed one-man cars showing the route over which such cars are to be used, the number of railroad tracks to be crossed, and the characteristics of each crossing, method of operation of doors and emergency exits, and such other details as the commission may require. The commission's approval shall be required before one-man cars may be placed in regular service.

Washington Jitneys Organize

W. R. Crawford and eleven others, representing jitney operators of Seattle, Wash., have filed articles with the Secretary of State incorporating the Mutual Union Association, an organization designed to permit jitneys to operate in Washington, notwithstanding the recent Supreme Court decision which holds bondsmen of jitney operators to $2,500 liability for each passenger injured in a jitney accident. This decision was reviewed in the issue of this paper for April 7, page 666. The insurance company is to be made up of members of the jitney drivers' union in the various cities of the State. Under the State law the new company must qualify to insure against accident, health and fire before being accepted by the State insurance commissioner as a company legally qualified to do business in that State.

The question of whether the jitney mutual insurance organization can also be so admitted to utility and fidelity insurance business under the present insurance laws of Washington has been submitted to the attorney general. The Pacific Coast Casualty Company and its successors have not written any surety bonds since the Supreme Court decision, which makes a jitney operator liable for all injuries that may be charged to the operation of the vehicle, rather than limiting the liability of the company to $2,500.

Seven-Cent Fare Authorized

Commission Grants One-Cent Increase on All Rates and Says New Schedule May Still Be Inadequate

The Public Service Commission of Massachusetts has authorized the establishment of a 7-cent fare unit on the Worcester & Warren Street Railway, Brookfield, Mass., effective April 1. Workingmen's tickets, valid week days between the hours of 5 and 7 both morning and evening, will be sold at the rate of fifty rides for $3.00. The previous cash fare was 6 cents, with workingmen's tickets at the rate of 100 for $5. The age limit for children carried free has been reduced from six to five years. An extra fare will be charged for every package carried by a passenger on the car platform.

In the entire history of the property, dividends of from 2 to 4 per cent have been paid in only four years. The 1916 net divisible income, after paying operating expenses and fixed charges, was only $1,083, or about 1 per cent on the capital stock outstanding, and only $156 was set aside for depreciation during the year. The earnings have been decreasing since 1903, although the fare was increased in 1905 from 5 cents to 6 cents. The total earnings last year were the lowest since 1897.

Assuming no decrease in traffic as a result of the increase in fares, the company estimated that the additional revenue derived from the increase, based on the fares collected in the fiscal year 1916, would be $8,141. Allowing for the increase in wages of about $2,000 annually, which was granted in 1916, but not for the added cost of materials and supplies due to prevailing high prices, the company estimated that on the basis of operating expenses and taxes for 1916, and without any further provision for depreciation, the additional revenue required to pay interest on the authorized funded debt and 7 per cent on the stock would be $9,968. The condition of the property also needs improvement. The commission doubts if the proposed new schedule would enable the company to earn even 6 per cent upon its present capitalization. The opposition centered chiefly in the proposed complete withdrawal of workingmen's tickets, and the company agreed to sell these at the 6-cent rate. Regarding the new fare the commission said:

"A 7-cent cash fare is open to objection on many grounds, and it may seriously be doubted whether such a fare will result in any substantial net benefit to the company. In this case, however, the change is open to less than the usual amount of objection, for the percentage of short-haul traffic is comparatively small, and the fare zones are comparatively long. In most of the zones the rate would be less than 2 cents per mile, even with the 7-cent fare. Furthermore, in view of the history of the company and the character of the territory in which it operates, it is reasonably entitled to make any experiments in fares which may have the effect of improving its financial condition and enabling it to continue in operation and gradually to improve its property. This was, it seems, the view of the representatives of the towns interested and the reason for the final withdrawal of the opposition."

Fares Raised in Ontario Cities

The Utilities Commission of Fort William, Ont., and the Public Utilities Commission of Port Arthur, an adjacent city, met in joint session on March 1 and adopted a new schedule of fares for the Port Arthur Civic Railway, operated by the latter commission and the Fort William Electric Railway. The increase in rates was to be made effective early in April.

The new schedule provides for one fare in each city thereby making two fare zones. The ordinary fare will be 5 cents, and six tickets will be sold for 25 cents, good from 5 a. m. until midnight. Workmen will be allowed eight tickets for 25 cents, good during certain morning and evening hours, and Sunday tickets at the same rate, valid from 5.30 a. m. until midnight. Children under fourteen years of age will be allowed ten tickets for 25 cents and students will be carried at the same rate between 8 a. m. and 5 p. m. on school days. A 10-cent fare will be charged from midnight to 5.30 a. m. good for a through ride.

During a discussion on the change in fares at a meeting of the Port Arthur Board of Trade on March 6, the consensus of opinion was that the fare should be high enough to permit the operation of the road to be profitable even if a 10-cent fare for all classes were necessary in each city. Mayor Cowan is said to be in favor of the higher fares, but the present increase is scarcely enough in his estimation. It was suggested that a straight 5-cent fare might be a feasible remedy for the situation. The City Council of Fort William has passed a resolution approving the new fare schedule.

Stock Sold to Employees

The Bangor Railway & Electric Company, Bangor, Me., has announced a plan for the sale of the common stock of the company to employees on the partial-payment plan. The stock is of the par value of $100 a share, and has been on a dividend basis of 2 per cent per annum since May 1, 1914. Present earnings are reported considerably in excess of this dividend requirement. The employees are free to accept or reject the offer to participate in the earnings of the company by becoming stockholders. Employees must be in the service six months, however, before they are permitted to subscribe.

The price to the men has been fixed at $40 a share. This nets a return of 5 per cent at the present dividend rate. The men are permitted to subscribe for one share for each $150 of wages received during the six months preceding April 1. No interest will be charged to the employees on the unpaid balance of subscriptions. One dollar per share per month will be withheld from the pay of each employee who elects to subscribe, and dividends paid will be credited on the purchase. At the present dividend rate, if the monthly payments are continued regularly by those who subscribed on April 1, the stock will be fully paid for by Feb. 1, 1920. Provision is made for the suspension of payments by the men in cases of sickness and other emergencies.

New Orleans Service Survey

Public Service Commissioner Points Out Problems Before Special Traffic Committee

V. K. Irion of the Public Utilities Commission of New Orleans, La., has issued a statement concerning the work before the special commission about to investigate the traffic over the railway lines of the New Orleans Railway & Light Company and report methods for its improvement. He said in part:

"The committee to investigate street railway traffic in New Orleans and to work out a plan for betterment of the service, has a man's size job on its hands, if it is to perform the work outlined for it in such a manner as to satisfy both sides in the controversy. The undertaking is difficult, complicated and laborious, requiring an enormous amount of work, pains and technical skill, and the result of its labors should be awaited patiently and hopefully by the public.

"To develop a plan by which the railway patrons will be guaranteed satisfactory service without materially curtailing the revenue of the company is the problem which has to be solved. The public demands, and must have, adequate service. The company cannot stand a curtailment of revenue to any great extent. Will the committee be able to reconcile these conflicting situations? It is to be hoped that each member of this committee will be able to enter upon the discharge of his duties with an open mind, free from prejudice or bias, and with a disposition fair to all parties concerned, in order that the findings of the committee, in the public estimation may not be weakened.

"The general opinion seems to be that the solution of the transportation problem lies in the employment of more cars on the various lines during rush hours. While this may, and no doubt does, have some bearing on the problem, there are many other elements involved in making a thoroughly adequate service. There are the schedules, for instance, which bear a very important relationship to good service, and the condition of the physical properties of the corporation also cuts a large figure in the case. It is hardly possible to develop a safe and satisfactory service unless these physical properties are maintained at a reasonably high standard of efficiency. This is a phase of the situation which should receive careful consideration."

President Loree Discusses Complaints

Leonor F. Loree, president of the Delaware & Hudson Company, which controls the United Traction Company, the Hudson Valley Railway and other properties, conferred at Albany, N. Y., recently with representatives of cities and villages of the Capitol District regarding complaints as to transportation service. President Loree promised to remedy all present defects in service on the steam lines of the company and to increase the equipment of the United Traction Company and the Hudson Valley Railway. He told the officials at the conference that the Capitol District should have a population of 2,000,000. A deeper Hudson was a certainty, but the Government should have recognized the need years ago. The age of co-operation on the part of big corporations was here. His company would at all times welcome suggestions as to how it could aid. He promised the same spirit of helpfulness on behalf of the United Traction Company.

One of the speakers complained of withdrawal of transfers and suspensions of local service on the Albany-Troy and Albany-Cohoes electric lines, and of the local service in Troy, Watervliet and Cohoes. He also suggested that Albany-Troy through cars and local Troy-Watervliet cars make a loop by using both bridges at Troy. Mr. Loree said his road would welcome a belt line arrangement if it was found to be the right remedy. Mr. Loree said that although the Delaware & Hudson Company had invested millions in the Hudson Valley Railway it had never paid because the property served an unprogressive territory. Mr. Loree said that the United Traction Company since 1911 had rebuilt, bought new or improved several hundred cars. He pleaded that delays in getting equipment delivered were never more severe than now.

Governor Vetoes Jitney Measures

Governor Ernest Lister of the State of Washington recently vetoed the measure placing jitneys and auto stages under the control of the Public Service Commission, and the second jitney bill providing for the bonding of jitneys, taxicabs and auto stages in cities of the first, second and third classes, failed to get into the House in time for action, and is dead for the session. As a result, liability bond companies will not write jitney insurance in cities of the first class, where a bond of $2,500 for each jitney is now required.

F. B. Kliphouse, secretary of the Spokane Jitney Association, recently reported that as local jitney men are unable to obtain bonds, they have concluded to ignore the bonding law. Instead of a surety bond, they will give a liability bond.

Mayor Fleming of Spokane has announced that a new and stringent ordinance governing the jitney bus business in Spokane will be drafted and presented to the City Council for passage within the next few weeks. The Mayor is reported to have said:

"I have no intention of running the jitneys out of business. We must, however, have regulation which will guarantee safety and service to the public. We have been denied this power up to now, but the decision of the State Supreme Court in the Bellingham, Wash., ordinance case puts a different complexion on the matter."

I. R. T. Replies to Suggestions

Suggestions for improvements in the service of the Interborough Rapid Transit Company, New York, N. Y., as reported in this paper for March 31, page 619, which were made by members of the Merchants' Association, have been answered by Theodore P. Shonts, president of the company. The abolition of stub tracks at South Ferry and the substitution of loop tracks to provide a continuous interchange between east and west side elevated trains is said to be impossible due to the lighter structure of the west side lines. The frequent interchange of trains would necessitate practically the entire reconstruction of these tracks to accommodate the heavy equipment used on the other lines in order to insure safety under all conditions of coupling the cars. Moreover, the continuous operation of trains would increase the difficulty of maintaining schedules by eliminating the interval of time at South Ferry which acts as a schedule equalizer.

Mr. Shonts said further that the construction of additional stairways and entrances to elevated stations is contemplated and that experiments are being made with folding gates on elevated cars and a design of sliding gate is also being worked out. It is said that the elimination of the stops of local subway trains at Grand Central Station during the rush-hour periods would throw two serious burdens on the express service, on the adjacent local stations, and on the express platform at Fourteenth Street. No reply was made to the matter of limitation of packages, etc., other than a statement of requirements as specified by the sanitary code of the Board of Health and of the regulations governing the distribution of newspapers.

Bay State Has New Publication

Triangle Talks is the name of the new publication issued by the Bay State Street Railway, Boston, Mass., the first number of which is dated April 14. It will be published weekly "to acquaint employees of the company with the business of the organization of which they are a part, create more good-will, assist in effecting economies in operation and help make conditions which will insure the public more satisfactory service." The first issue contains a personal message from President P. F. Sullivan to his co-workers, in which he explains to them fundamental factors in the financing of a corporation and how the employees can assist their employer. He reviews the development of electric street car operation and the changes that have tended to make it unprofitable and finally appeals for full-hearted co-operation on the part of all.

Want Speed Limited in Cleveland.—The local branch of the Amalgamated Association of Street & Electric Railway Employees at Cleveland, Ohio, has asked that a maximum limit of speed for street cars be included in Councilman Kadlesek's traffic ordinance pending before the City Council. The men contend that the speed at which cars are now operated in the congested district is too great for safety.

Increase in Freight Rates in Illinois.—The recent increase in freight rates granted by the Public Utilities Commission of Illinois consists of a 5 per cent increase applying to coal, livestock, explosives and steel. No other commodities are included, and there were no increases in class rates. The increase goes into effect on April 15. It will affect all common carriers in the State which have filed a schedule of rates.

High-Speed Cars for Detroit United.—Eight new high-speed interurban cars have just been placed in service by the Detroit (Mich.) United Railway, the order for which was placed more than a year ago. The equipment is such that the cars may be operated separately or in trains. Eight more heavy interurban cars have been ordered for spring delivery, making a total of thirty-two new cars placed in service by this company in a period of a few months.

Pennsylvania Commission Bars Jitneys.—A recent decision issued by the Public Service Commission of Pennsylvania refused Adele Hartel a certificate of public convenience for the privilege to operate a jitney on Baltimore Avenue from Cobb's Creek to Lansdowne, near Philadelphia. The decision was so rendered as to apply also to the cases of two other prospective operators who sought similar privileges. The issuance of certificates was opposed by the Southern Pennsylvania Traction Company, which operates in the territory.

Good-Service Department Organized.—The Georgia Railway & Power Company, Atlanta, Ga., has just organized a good-service department, with Paul D. Reid as manager. Mr. Reid was previously assistant to W. H. Glenn, vice-president and operating manager. The work of the new department will be to handle all suggestions for improvements in the service with a view toward pleasing the public so far as possible. It will study the problems in co-operation with other departments. Another function of this department will be to determine possible improvements in the company organization.

Skip-Stop Pleases Patrons in Detroit.—The skip-stop plan has now been in operation for several months on some of the lines of the Detroit (Mich.) United Railway. Officials of that company feel that this form of express service has won the approval of the public and that patrons would object to a return to the former system of operation. In fact, many patrons have urged that the distance between stops be increased to three and even five blocks. In its weekly publication, *Electric Railway Service*, the company expresses the opinion that the success of the plan would seem to warrant its trial on other lines.

Hotel Guide Issued by "Shore Fast Line."—The Atlantic City & Shore Railroad, Atlantic City, N. J., has just issued a four-page vestpocket hotel directory for the use of its patrons, especially strangers in the city. When a conductor is asked the location of a certain hotel, he presents the passenger with one of the directories after checking off the particular hotel from the alphabetical list. This form of courtesy has provoked a considerable amount of favorable comment. The company has adopted for publicity purposes the designation "Shore Fast Line" as a title for its entire system. This name appears on the folder.

United Traction Specifies Fares.—Following the attempt to compel a reduction in fares as reported in this paper for April 7, page 667, the United Traction Company, Albany, N. Y., has announced a tentative fare schedule for its line from Albany to Troy and intermediate points. It provides transfer privileges and a 15-cent fare for a through ride. Certain variations are included which specify a 10-cent fare for some patrons, and no transfers are issued in some cases. The company feels that discrimination is apparent, and that further changes are necessary. It was stated that the Albany Chamber of Commerce would oppose the 10-cent rate from Schuyler Bridge to Albany before the Public Service Commission.

Jitney Restrictions Urged by Railway Men.—The platform men of the Los Angeles (Cal.) Railway, in a mass meeting held on March 22 to discuss a proposed demand for a 15 per cent increase in wages, appointed a committee of 250 to appear before the City Council and demand that the city restrict jitney-bus competition. The sentiment was expressed that the city should enact legislation which will permit the railway to compete with the buses on an even basis. Speakers asserted that the Council has discriminated against the railways in favor of the bus companies and that a readjustment was necessary before an increase in wages could be hoped for, and this seemed to be the sentiment of the men. The City Council recently adopted an ordinance fixing license rates for passenger-carrying buses at $11.25 per quarter for five-passenger to $34 for thirty-passenger vehicles. This was an increase of about 30 per cent over the old rates.

Railways Handle Revival Crowds.—The problem of transporting the crowds numbering at times 20,000 people that attend the Billy Sunday meetings in New York, which began on April 8, is not so acute as it has been in other cities. The Fifth Avenue Coach Company has been granted permission by the city to extend some of its routes to the tabernacle site at 168th Street and Broadway, and a schedule is maintained of about one bus per minute. The buses provide an open-air service, and will no doubt be an important factor in moving the crowds during the three spring months of the campaign. The subway trains of the Interborough Rapid Transit Company remove from the 168th Street station, without undue congestion, that portion of the crowd choosing this route, and the people are requested to use the adjacent subway stations to reduce the congestion at that point. With the surface cars and other methods of travel to and from the tabernacle, the effect on either system is not equal to that of the rush hours.

Traffic Over the New Washington-Oregon Bridge.—During the first month of operation of the interstate bridge over the Columbia River, between Portland, Ore., and Vancouver, Wash., the average number of passengers on each street car crossing the structure was sixteen. The Portland Railway, Light & Power Company, which operates the cars on the bridge, pays 25 cents toll each time a car crosses the bridge, and 3½ cents for each passenger. On this basis, the company pays in toll slightly more than 5 cents out of the 15-cent fare charged each way to Portland or Vancouver. On this basis, the company now receives less money for hauling passengers into Vancouver or Portland than it did before the bridge was opened. The company had estimated that the average number of passengers per car would approximate twenty-one. When the bridge was opened, the round-trip fare between the two cities, which had been 25 cents, was increased to 30 cents.

Accident Warning by Illinois Secretary of State.—A neat little folder admonishing automobile drivers to use great caution in crossing railway tracks is being sent by the Secretary of State of Illinois with the license certificate to automobile drivers. On the front cover of this folder a statement signed by the Secretary reads as follows: "In sending you the inclosed card, I wish to call your attention to the large number of persons whose lives are unnecessarily sacrificed in accidents on railroad grade crossings each year. It seems to me that many of these accidents can be prevented if the drivers of automobiles would use ordinary care when crossing railroads at grade. I urge you to examine the contents of this folder carefully and to be guided by the good advice contained therein." The inside of the folder contains further information regarding the increasing number of automobile accidents at grade crossings throughout the United States. An illustration is given which shows a crossing watchman displaying a large disk on which appears the word "Stop," and it is stated that this method of warning travelers is now used by many roads. This information comes to the automobile driver from a source which demands attention and must arouse some thought on his part. It is a commendable idea for all states to follow, and one which the railways can encourage.

Changes in Public Service Personnel

Some Information Regarding Individuals Affected by Recent Rearrangement of President McCarter's Staff

The several officials of the Public Service Corporation of New Jersey whose duties have been changed in accordance with the plan outlined in last week's issue of the ELECTRIC RAILWAY JOURNAL have taken up their new work during the past few days. The careers of these men have been intimately tied in with the development of the Public Service property so that the following details will serve as at least a partial history of that development.

George J. Roberts, who retires from the first vice-presidency, came to Public Service from the United Gas Improvement Company in 1907. He was graduated from Stevens Institute of Technology in 1884, and began his career with four years of steam railroad work. This he regretted at the time, as he found the future in the railroad field unpromising and turned to the gas industry which seemed more promising. Laying his railroad years on the shelf he determined to learn the gas business from the bottom up, and as a result soon fitted himself for the position of construction engineer with the U. G. I. He was at first engaged on gas plants for this company in different parts of the country, but when it became interested in electrical properties Mr. Roberts was selected as one of the men to represent the owners in this field. He studied this business as he had the gas business, and when, in due course, the company began to take on street railways he was able to utilize his knowledge of the electrical as well as the railroad field. The U. G. I. had no railway operators in its organization, so he took a leading part in the new phase of the company's activities.

His experience of twenty-three years fitted Mr. Roberts well for the position which he has occupied in Public Service for ten years. He has been in close touch with the operating problems of all of the component properties. Last fall he was obliged to undergo surgical operations for troubles from which he had long suffered, and which finally obliged his retirement to his farm in Charlottesville, Va. It is his intention to remain here until he has regained his full strength.

Edmund W. Wakelee, who becomes a vice-president of Public Service, was a member of the New Jersey Legislature for twelve years, ten in the Assembly, the rest in the Senate. He became Assemblyman from Bergen County to fill an unexpired term and was later elected three times. In 1903 he was leader of the majority in the Senate at the time, being the youngest Republican Senator. He was also at one time president of the Senate. When he was in the Assembly Mr. Wakelee was also majority floor leader.

During the formative period of the New Jersey & Hudson River Railway & Ferry Company (now the Bergen Division of Public Service Railway), Mr. Wakelee was its legal representative and was receiver for one of the underlying companies. He was also head of the legal firm of Wakelee, Thornale & Wright and still retains an interest in this organization.

Mr. Wakelee joined Public Service law department about four years ago as assistant general solicitor. He has represented the company in its dealings with municipal bodies, State agencies, etc. He became at once a member of the executive committees of the operating companies and of the public relations committee of the corporation. As vice-president he will have particularly to do with public relations matters.

P. S. Young also becomes a vice-president of Public Service. Although originally a gas man he is well known in the electric railway field through his interest in the American Electric Railway Accountants' Association, of which he is a past president. He came from London, England, to New York in 1886 and spent the following four years on a ranch in the West. After five years spent with the Omaha (Neb.) Gas Company he became auditor of the U. G. I. and in 1897 was appointed assistant general agent at Jersey City. Later he was successively assistant treasurer and secretary of the Hudson County Gas Company and comptroller of Public Service when it was formed in 1903 and treasurer also in 1914. Shortly thereafter he was appointed vice-president of the operating companies also. Aside from his interest in accounting matters Mr. Young has been active in the commercial side of the work of the company and served a term as president of the National Commercial Gas Association. For nine years he has had charge of the commercial department of Public Service, on both the gas and electric sides. He is well known also for his sympathetic and practical interest in the development of the young men on his staff and outside of it, especially encouraging the taking of correspondence courses and college courses when practicable. Mr. Young holds the degree of Bachelor of Commercial Science from New York University.

G. J. ROBERTS

E. W. WAKELEE

P. S. YOUNG

DUDLEY FARRAND

Dudley Farrand, formerly general manager of Public Service Electric Company, becomes an assistant to President McCarter. He has been in the local electrical industry for thirty years, beginning as clerk in the office of the Newark Electric Light & Power Company when just out of Newark Academy. At the time the company had a small arc and incandescent lighting business. Mr. Farrand has continued with the same company and its successors. By way of contrast with the merger of electrical equipment of 1887 in Newark it is of interest to note that his last important act as general manager of the electric company was to close a contract for a 50,000-kw. turbine unit, which is to be delivered in 1919.

Mr. Farrand has always taken an active interest in the electric railway. He was one of the incorporators of the New Jersey Street Railway, about 1898, and was a director of the Consolidated Traction System which absorbed it. On the lighting side he was manager of the People's Light & Power Company, in which position he made a record for speedy restoration of service after the destruction of the company's power house by fire. In 1899 the scope of this company was enlarged and it became the United Electric Company of New Jersey, Mr. Farrand becoming general manager. On the formation of Public Service with its several departments he was appointed general manager of the electrical department, and when the operating company organization was put through in 1910 Mr. Farrand became vice-president and general manager of the Public Service Electric Company.

John L. O'Toole also becomes assistant to the president of Public Service Corporation, being promoted from having charge of its publicity department. During the eight years since he left the city editor's desk of the Newark *Evening News* he has done much more than publicity work in the usual sense of that term. In fact, as a member of the company committee on public relations since its formation in 1913 he has had much to do with organizations representing communities as well as with the general public. Mr. O'Toole was with the *News* for sixteen years, during the latter half of which he was city editor.

J. L. O'TOOLE

The new treasurer of Public Service, T. Wilson Van Middlesworth, is a man of thirty-three, who has by consistent attention to detail earned steady promotion. He was born and still lives in New Brunswick, where he graduated from the city high school. After a business college course in Newark he became a clerk in the office of the engineer of the Essex & Hudson Gas Company in 1902. A year later this with other properties was taken over by Public Service, young Van Middlesworth along with it. He was first made secretary to J. P. Dusenberry, the treasurer, and a year later stock transfer clerk. In 1909 he became cashier and in 1911 assistant treasurer.

The men mentioned above are all Public Service Corporation men, whose general jurisdiction includes the railway and the railroad, together with the other operating organizations. The corporation organization changes have been accompanied with some promotions in the operating ranks. Among these is the change in title and duties of Martin Schreiber from engineer of maintenance of way to chief engineer of the Public Service Railway. Mr. Schreiber has had charge of the design and construction of the new terminal in Newark as well as many other structures of importance. He is a graduate of Ohio State University, class of 1899, in mechanical and electrical engineering, and secured his first practical experiene with the Cleveland Electric Railway as eletrician and engineer. He has been with his present employer for a period of fourteen years, during which time he has constantly been entrusted with more and more responsibility.

T. W. VAN MIDDLESWORTH

MARTIN SCHREIBER

Mr. Schreiber is a "joiner" in that he takes an active part in many associations in the field of his interest. He was president of the American Electric Railway Engineering Association for a term and has served effectively on many committees of this and other technical associations. He is widely known also as the present chairman of the American Association committee on company section and individual membership.

Personal Mention

Eugene Cooper has been appointed treasurer of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.

J. R. Abercrombie has been appointed secretary of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.

Frank W. Brooks, president of the Detroit (Mich.) United Railway, has returned from a six weeks' trip to California and Honolulu, Hawaii.

Frank R. Coates, president of the Toledo Railways & Light Company, Toledo, Ohio, has been appointed a member of the Toledo welfare commission.

Gilbert E. Porter has been appointed assistant to F. W. Shappert, traffic and industrial agent of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

Gen. Edwin W. Hine, assistant to the president of the Public Service Corporation of New Jersey, Newark, N. J., has been granted a leave of absence for one year on account of military duties as an officer of the New Jersey National Guard.

E. J. Billings, formerly superintendent of power of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., operated by H. L. Doherty & Company, New York, N. Y., has assumed the duties of a general efficiency engineer for the Doherty organization.

W. S. Murray of McHenry & Murray, engineers, New Haven, Conn., has been elected president of the Housatonic Power Company, which supplies power to part of the lines of the Connecticut Company, New Haven, and also does a general lighting and power business.

Charles E. Foster, heretofore secretary and treasurer of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., has been appointed comptroller of the Crew Levick Company, Philadelphia, Pa. Both of these companies are subsidiaries of the Cities Service Company, New York, N. Y.

Paul D. Reid, who for six years was private secretary to W. H. Glenn, vice-president and operating manager of the Georgia Railway & Power Company, Atlanta, Ga., has been appointed manager of the good-service department. This is a new department of the company, organized to keep in touch with public needs and criticisms, with a view toward perfecting the service.

Alvah J. Clement has retired from the position of cashier and paymaster of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y. He has been in the employ of the company since the line was opened between Rochester and Albion in September, 1908. The employees with whom Mr. Clement has been associated presented him with an amethyst ring and a pearl scarf pin as a token of their esteem.

James A. Braden, who has been freight, passenger and claim agent and manager of publicity of the Northern Ohio Traction & Light Company, Akron, Ohio, has resigned to enter the advertising business. He will open an office in Cleveland. Mr. Braden has acquired a wide experience in advertising and publicity work. He was formerly for ten years advertising manager for the Diamond Rubber Company, Akron.

James F. Hamilton and **James P. Barnes** were the guests at a dinner at the Hotel Claridge, New York, on April 11. given in honor of their recent appointments as general managers respectively of the Rochester and Schenectady electric railway systems. About sixty were present, and the affair was opened by singing the "Star Spangled Banner," led by a quartet of soldiers and sailors. Later there were a number of speeches in which those present felicitated Messrs. Hamilton and Barnes, as well as their companies, upon the recent appointments. Charles C. Castle presided.

Oscar T. Crosby, publicist, explorer, engineer and electric railway executive, has just been nominated by President Wilson for appointment as Assistant Secretary of the Treasury. Mr. Crosby has agreed to accept the appointment with the understanding that he is to be released for military duty as a reserve major of engineers if his class is called to service. Mr. Crosby was for many years very closely identified with electric railway construction and operation, being one of the pioneers with Frank J. Sprague and later an executive of large railway properties in Washington, D. C., Wilmington, Del., and Trenton, N. J. More recent activities have included exploration in the Soudan, Thibet and Borneo, active interest in the proposed International Court of Decree and Enforcement and as resident manager in Belgium of the work of the American Commission for the Relief in Belgium and northern France. After his return from Thibet Mr. Crosby published a most interesting account of his travels in that country in a book entitled "Thibet and Turkestan." He is also the author of a book on "Strikes" and of a large number of essays in the fields of engineering and politico-sociology.

Daniel L. Turner, who has been acting chief engineer of the Public Service Commission of the First District of New York since the appointment of Alfred Craven as consulting engineer of the commission in October, 1916, has been made chief engineer. Mr. Turner was graduated as a civil engineer from Rensselaer Polytechnic Institute of Troy with the class of 1891 and for several years was an instructor in that institution and later in Harvard University, where he conducted courses in topographical, railroad, hydraulic, water-power, canal, river and irrigation engineering and also engaged in consulting practice. In 1900 he joined the engineering staff of the Rapid Transit Commission in New York as assistant engineer. He became general inspector of stations in 1905 and continued in that capacity with that commission and the Public Service Commission, later becoming chief of the transportation department. In 1912 he was appointed division engineer supervising the subway construction which cost about $30,000,000, and the next year was made deputy engineer in direct charge of this work. Mr. Turner, by reason of his long connection with the transit development of the city, is thoroughly familiar with both construction and transportation problems which it involves. He is a member of the A. S. C. E., the Boston Society of Civil Engineers and the Municipal Engineers of New York City.

R. N. GRAHAM

R. N. Graham has been appointed manager of railways of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, succeeding Richard T. Sullivan. Mr. Graham was born in Jackson, Ohio, in 1877, and was graduated from the University of Arkansas with the class of 1898. He then practiced law in Joplin, Mo., until 1908 and during this time served as a member of the Missouri Legislature from the Joplin district. Mr. Graham entered the electric railway field through a connection of several years with the legal departments of the Houston (Tex.) Electric Company and the Galveston-Houston Electric Railway. In 1916 he was appointed assistant manager of railways of the Mahoning & Shenango Railway & Light Company in charge of the transportation department, and in his new capacity will have charge of all the railway lines of this company including city lines in Warren and Youngstown, Ohio, and New Castle and Sharon, Pa., and interurban lines connecting those points and other important centers in the Youngstown iron and steel district. While Mr. Graham was a member of the bar his work in Missouri, Kansas, Oklahoma and Texas dealt with municipal and corporation problems and this experience has fitted him eminently for the duties he now assumes.

R. T. SULLIVAN

Richard T. Sullivan, who for the last year has been manager of railways of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has been appointed general manager of the company and all its subsidiaries. The Mahoning & Shenango System comprises about 200 miles of interurban and street railway lines which extend into Pennsylvania and serve all the principal centers in this territory, which is an important iron and steel district. Mr. Sullivan was born in Newton, Mass., and was educated in the public schools there, the Massachusetts Institute of Technology and Harvard University, taking the degree of electrical engineer at the latter institution in 1906. He subsequently became connected with the properties of the Stone & Webster Management Association and in 1908 was appointed general superintendent of the city and interurban railways of the Houston (Tex.) Electric Company, which position he held for eight years. During that time, in addition to his duties, he was engaged in many investigations which necessitated extensive trips to the principal cities of the North and East and the Pacific States. While a resident at Houston, Mr. Sullivan made many friends and took a prominent part in civic affairs, in club and social life. In April, 1916, he was appointed to the position which he has just relinquished and his work since that time has been such as to warrant his present promotion.

Ralph M. Sparks, formerly general passenger agent of the Bay State Street Railway, Boston, Mass., has been appointed assistant to the general manager. Mr. Sparks is well known in the electric railway field. He was educated at Purdue University, where he took a civil engineering course. For a time he was employed as timekeeper and foreman of the Union Traction Company of Indiana, Anderson, Ind., and later was an assistant in the engineering corps of the Chicago & Eastern Illinois Railroad. In 1910 he was engaged by President Sullivan to handle special work for the Bay State Company, and in 1912 was appointed general passenger agent. He has very recently handled a large number of special reports for the late Henry E. Reynolds, who was until his death assistant general manager of the company. Mr. Sparks' varied experience in the company and his personal contact with the public can be regarded as invaluable in the preparation for his new and responsible work.

Obituary

Henry A. Everett, Cleveland, who recently disposed of his interest in the Northern Ohio Traction & Light Company, Akron, Ohio, died at Pasadena, Cal., on April 11. Mr. Everett was born in Cleveland on Oct. 16, 1856. For a number of years he was secretary and treasurer of the East Cleveland Railway, of which his father was president. Under the Everett regime the company was one of the first to adopt electricity as motive power. Subsequently Mr. Everett entered the independent telephone field, and also the interurban electric railway field. Among his first interurban projects was the Akron, Bedford & Cleveland Railway, now a part of the Northern Ohio Traction & Light Company system. Later he was identified with other electric railways, as in Toledo, Toronto, Detroit and Columbus, as well as with the telephone interests in Canada. Mr. Everett was one of the first to recognize the possibilities of electric traction, especially for interurban service, and his courage, backed by his financial resources, greatly stimulated electric railway development in the early days. During his later years, although not in good health, he maintained an active interest in his electrical properties. At the time of his death he was one of the vice-presidents of the Lake Shore Electric Railway, and was also interested financially in the London (Ont.) Street Railway.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Transcona Electric Railway, Winnipeg, Man.**—Application for incorporation has been made to the Manitoba Legislature by the Transcona Electric Railway to construct a line in Transcona and in the municipalities of Springfield and East Kildonan to Winnipeg or St. Boniface, to connect with any lines in operation or to be built by the Winnipeg Electric Railway. The office of the company will be in Winnipeg. Capital stock, $1,000,000. The provisional directors are E. P. Garland, E. Frith, C. W. Chappell, R. Siderfin and L. Palk, all of Winnipeg. Mr. Palk is claim agent of the Winnipeg Electric Railway.

***Dickinson & Northwestern Railway, Dickinson, N. D.**—It is reported that this company has been granted a charter for the construction of a 40-mile electric railway. W. L. Richards, Dickinson, is interested.

FRANCHISES

Los Angeles, Cal.—The Pacific Electric Railway has received a forty-year franchise from the Board of Supervisors to construct and maintain an electric railway along certain public roads and highways of Los Angeles County, consisting of a standard-gage single and double-track spur over and across Covina Boulevard, along Railroad Avenue and over and along Clark Street and Los Angeles Street, single-track spur over and across Covina Boulevard and along Railroad Avenue from the north right-of-way of the Pacific Electric Railway, Covina line to Alderson Avenue, double-track spur over and across Clark Street to the Southern Pacific Railroad Company's right-of-way, single-track spur over and across Los Angeles Street.

Atlanta, Ga.—The committee on electric and other railways has recommended to the City Council that the Federal Construction Company receive a one year's extension of time on its franchise, until April 25, 1918, in which to begin construction of its line in Atlanta. [March 17, '17.]

Springfield, Ill.—The Springfield & Carbondale Railway has asked the Public Utilities Commission of Illinois for a certificate of convenience and necessity to construct its proposed line from Springfield to Carbondale. C. H. Forrester, 76 West Monroe Street, Chicago, president. [March 10, '17.]

Indianapolis, Ind.—The Terre Haute, Indianapolis & Eastern Traction Company has asked the Board of Public Works of Indianapolis for permission to lay additional track from Holmes Avenue northwest over the company's right-of-way to the Indianapolis motor speedway.

Ithaca, N. Y.—The Ithaca Traction Company has asked the City Council of Ithaca for a franchise to construct a single track extending north from State Street on Meadow Street, thence easterly along private right-of-way to Railroad Avenue to Tioga Street, making a loop connecting State Street, Meadow Street, Railroad Avenue and Tioga Street.

Milford, Ohio.—The Cincinnati, Milford & Loveland Traction Company has received a ten-year franchise from the City Council to furnish light and power to Milford.

***Gettysburg, Pa.**—The Washington, Westminster & Gettysburg Railway has received a franchise from the City Council to construct a line in Gettysburg.

Green Bay, Wis.—The Green Bay & Eastern Railway has received from the Wisconsin Railroad Commission a certificate of convenience and necessity for the construction of its proposed line from Green Bay to Manitowoc, with extensions eventually north to Sturgeon Bay and south to Sheboygan. William M. Willinger, Manitowoc, president. [April 29, '16.]

TRACK AND ROADWAY

Fort Smith Light & Traction Company, Fort Smith, Ark.—Surveys are being made by this company for an extension to Jenny Lind and Greenwood.

***Dolly Varden Mines Railway, Victoria, B. C.**—Hon. Mr. Oliver, Minister of Railways, recently introduced a railway bill into the House covering the construction of the Dolly Varden Mines Railway, giving the Dolly Varden Mines Company, Ltd., power to construct and operate either a steam or electric railway of either standard or narrow gage, from a point near the Wolf Group of Mineral Claims, 18 miles up the Kitzault River down the river course to a public highway, thence along the highway down the river valley to Allis Arm. The company may also build and operate branch lines, each branch not to exceed 10 miles in length. The company is given the right to occupy a 25-ft. right-of-way upon any part of the public highway mentioned.

Chicago, Peoria & Quincy Traction Company, Peoria, Ill.—Sam Woolner, promoter of the Chicago, Peoria & Quincy Traction Company, has made a proposition to the citizens of Quincy for the extension of the proposed interurban road from Peoria to Quincy through the coal fields of Rushville. He asks that a promoting company with a capital stock of $25,000 be formed in Quincy to pay preliminary expenses, and if that is done agrees to enter into a contract with the investors to extend the road into Quincy. He further agrees to refund the $25,000 when the road is completed in addition to a bonus of a like amount in stock in the road. No other subscriptions locally will be liable until the cars are operating between Rushville and Quincy. The same conditions apply concerning stock between Rushville and Peoria. All bills and expenses to be paid out of the $25,000 put up by local financiers will be presented to the Quincy investors in legal form. [April 29, '16.]

***Vincennes, Ind.**—An interurban line between Vincennes, Ind., and Lawrenceville, Ill., is being proposed by E. B. Denison, Buffalo, N. Y., and associates.

***Topeka, Kan.**—The construction of a 100-mile electric railway from Topeka, through Pottawatomie and Riley Counties to Randolph, is being considered by the Topeka Chamber of Commerce. E. C. Newby, Randolph, promoter.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me.—This company has purchased Gray's Wharf in Gardiner, with a river frontage of more than 500 ft. The company plans to expend about $100,000 in the improvement of the property. An order has been placed for two large electric cranes which are to be used to facilitate the rapid unloading of vessels and barges. The principal product handled will be coal, which will be shipped by electric freight to the various plants of the railway and other sections where desired.

Berkshire Street Railway, Pittsfield, Mass.—This company will reconstruct its tracks on State and Union Streets, North Adams.

Mascoutah-Belleville Traction Company, Belleville, Mo.—Master in Chancery Tecklenburg at Belleville recently recommended the sale of property of the Mascoutah-Belleville Traction Company and the appointment of a new receiver. The company was promoted in 1909 and was capitalized for $150,000. Right-of-way was acquired and some bridges built, but no rails were laid. Of the capital stock $30,000 was subscribed by Belleville and Mascoutah residents.

Interborough Rapid Transit Company, New York, N. Y.—On March 31, under direction of the Public Service Commission for the First District of New York, the Interborough Rapid Transit Company placed in operation an additional portion of the White Plains Road extension of the first subway between 219th Street and 238th Street, the Bronx. Operation as far as 219th Street was begun on March 3. One remaining portion of the line yet remains to be placed in service, namely, that between 238th Street and 241st Street, the opening of which, however, must be delayed until certain construction work is completed. The Public Service Commission has awarded to the Ramapo Iron Works, New York City, the lowest bidder, at $28,170, a contract for the supply of special work for use on the Jerome Avenue branch of the Lexington Avenue subway, the Broadway subway in Manhattan, and the Livonia Avenue extension of the Eastern Parkway subway in Brooklyn.

Long Island Railroad, New York, N. Y.—This company has purchased a six-lever Saxby & Farmer interlocking machine and attendant apparatus from the General Railway Signal Company, New York, to be installed at Sayville, N. Y., by the railroad company's forces.

Union Railway, New York, N. Y.—A public hearing has been announced for April 20 by the Board of Estimate and Apportionment at the City Hall upon the proposed contract of the Union Railway, which has made an application for a franchise to construct, maintain and operate a street surface railway upon and along Amsterdam and Nagle Avenues and Dyckman Street. The proposed line will extend from West 207th Street to the right-of-way of the New York Central Railroad Company at or near the foot of Dyckman Street, as an extension to its existing system.

Cincinnati, Milford & Loveland Traction Company, Cincinnati, Ohio.—This company contemplates the construction of an extension from Blanchester to Wilmington.

Oklahoma (Okla.) Railway.—Right-of-way is being obtained by the Oklahoma Railway for a 5-mile extension.

***Kitchener, Ont.**—The construction of an electric railway between Guelph and Kitchener is being considered. It is understood that the project is to be part of the proposed hydroelectric line.

***Essex Terminal Railway, Walkerville, Ont.**—It is reported that this company will make surveys for an electric railway from Ojibway to Amherstburg. Owen McKay, engineer.

Dallas Northwestern Traction Company, Dallas, Tex.—An order has been placed by the Dallas Northwestern Traction Company for 50,000 cross-ties, and it is expected that construction between Denton and Krum will be begun within a few weeks. E. P. Turner, Dallas, president. [March 24, '17.]

Olympia Light & Power Company, Olympia, Wash.—This company will immediately begin laying tracks for its line on West Fourth Street.

Seattle & Rainier Valley Railway, Seattle, Wash.—Walter F. Brown, general manager of the Seattle & Rainier Valley Railway, states that work will be begun at once on the construction of a double-track line on Dearborn Street, between Seattle Boulevard and Rainier Avenue, as well as on the construction of a new line on Genesee Street, and the transferring of the company's tracks from private right-of-way to Rainier Avenue, between Thistle Street and Fifty-first Avenue South, aggregating approximately 3 miles of new construction.

Tacoma, Wash.—City Engineer A. L. Nicholson of Tacoma, Wash., has been instructed by the Council to make a survey and prepare an estimate of the cost of constructing an extension to the municipal car line across the tideflats to the plant of the Todd Shipbuilding & Construction Company. Mayor Fawcett states preliminary work on a single-track line from the present terminus at the city limits will begin before May 1. It has been estimated that the extension will cost about $40,000. This does not include the cost of the viaduct over the network of tracks at the shops of the Chicago, Milwaukee & St. Paul Railway Company. Engineer Nicholson estimated the cost of double track, with loops at either terminus, at $110,000.

Monongahela Valley Traction Company, Fairmont, W. Va.—The eventual construction of an interurban line to connect Parkersburg, W. Va., and Marietta, Ohio, with Fairmont has been announced by the Monongahela Valley Traction Company. The route of the proposed line is via New Martinsville and the Ohio River. The Mannington line will be extended to New Martinsville, 20 miles. From New Martinsville to Sistersville the lines of the Tyler Traction Company will be used temporarily. The Parkersburg-Marietta system will be connected by building a new line about 30 miles long.

Lewisburg & Ronceverte Electric Railway, Lewisburg, W. Va.—It is reported that the Lewisburg & Ronceverte Electric Railway has been purchased by H. L. Van Sickler and W. S. Coursey, who contemplate improvements.

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—This company will construct car inspection sheds at 800 Mission Road, at a cost of $16,000.

Georgia Railway & Power Company, Atlanta, Ga.—Work will be begun about May 1 by the Georgia Railway & Power Company on the construction of a new carhouse at Marietta and Ashby streets. The building will be of brick and cement construction and will have a capacity of about seventy-five cars. The cost is estimated at about $40,000.

Fort Wayne & Decatur Traction Company, Decatur, Ind.—Plans have been prepared by the Fort Wayne & Decatur Traction Company for the construction of a new passenger station and a new freight station at Jackson and Second Streets, Decatur.

Interborough Rapid Transit Company, New York, N. Y.—In the belief that it will add greatly to the convenience of the public, the Public Service Commission for the First District of New York has approved a plan by which the mezzanines at Fortieth Street and near Forty-second Street over the Times Square express station on the Broadway subway will be connected and a wide mezzanine constructed to cover substantially the whole station area. It is estimated that the work will cost about $150,000, but the advantages to traffic resulting will be more than sufficient to warrant the expenditure.

Northern Ohio Traction & Light Company, Akron, Ohio.—Construction of a new terminal station has been begun by the Northern Ohio Traction & Light Company at North Main Street, Akron. The building is designed for twelve stories, but only four will be built this year. Steel and terra cotta blocks will be used. The first floor plan provides for a large waiting room, ticket offices, restaurant, etc., and the offices of the company will be located on the second and third floors.

Oklahoma (Okla.) Railway.—Work will soon be begun by the Oklahoma Railway on the construction of a new station at Edmond, Okla., at a cost of $10,000.

Philadelphia, Pa.—Sealed proposals will be received by the Department of City Transit, Philadelphia, Pa., William S. Twining, director, until 12 o'clock noon, on April 17, for additional steel superstructure and appurtenant work to provide station platforms on the Frankford Elevated Railway at Huntingdon Street (Contract No. 520). Copies of plans and specifications may be obtained upon deposit of $10, to be refunded upon return of plans.

POWER HOUSES AND SUBSTATIONS

Pacific Electric Railway, Los Angeles, Cal.—This company will construct a new substation at Alhambra.

Fort Wayne & Decatur Traction Company, Decatur, Ind.—This company's power house was recently destroyed by fire, causing a loss of about $50,000.

Interborough Rapid Transit Company, New York, N. Y.—This company will construct a new two and four-story boiler plant at its yards at 239th Street. The structure will be 57 ft. x 101 ft., and will cost about $70,000.

Youngstown & Sharon Street Railway, Youngstown, Ohio.—This company will extend its transmission line to Lisbon.

Pittsburg County Electric Railway Company, McAlester, Okla.—This company will install a new engine in its generating plant to take the place of an engine that was recently wrecked by an explosion.

Jackson Railway & Light Company, Jackson, Tenn.—A contract has been awarded by the Jackson Railway & Light Company to E. G. Parrish, Jackson, for an addition to its power house.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—During the coming summer the Milwaukee Electric Railway & Light Company will construct a new steam generating plant on the shore of Lake Michigan just south of St. Francis. The initial capacity will be 65,000 kw., which will ultimately be increased to 200,000 kw.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Overhead Manufacturers State Delivery Conditions

Standard Materials Shipped from Stock—Non-Standards Difficult to Promise—Large Orders of Standard Materials in Six Weeks or Longer

Delivery conditions on maintenance and construction materials are now in such a changeable state that authoritative information from the manufacturers should be of interest. A letter recently addressed to the producers of the larger part of the overhead line materials used in electric railway industry has brought prompt statements regarding the deliveries which these manufacturers are now in a position to make.

SHIPPING STANDARD CATALOG ARTICLES

The first question put to the manufacturers referred to overhead line materials for maintenance work, these materials to be standard catalog articles, not special in any way —"Could you make shipment from stock within thirty days?" One manufacturer replied that "Up to the present time we have been able to ship standard catalog articles of line materials from stock in a great majority of cases. Very few cases have required more than thirty days. The exceptional cases are caused usually by demand largely in excess of previous experience on the particular article, even after taking into consideration the increased buying movement of the past several months. Where additional stock is dependent on malleable iron castings or steel products, the delay will range anywhere from six weeks to three months. There have been a few extreme cases even worse than this."

Another manufacturer states, "We can ship over 90 per cent of the devices appearing in our catalog from stock in reasonable quantities. The remainder, if made of brass or composition metal, can be supplied in ten days, or if of malleable iron in four to six weeks." A third manufacturer can promise shipment of catalog line materials from stock or within thirty days.

DELIVERIES OF SPECIAL DESIGNS

With regard to deliveries of orders for special overhead materials, that is, something not regularly listed, one manufacturer points out that the time of deliveries would depend on the pattern and the material required but would take at least twice the length of time required for standard production. Another manufacturer says that deliveries on special overhead materials can be made in from six to eight weeks, and a third manufacturer states that it is impossible to set down the time with any accuracy. On this point, he says:

"Articles requiring new patterns, tools, etc., are especially difficult to handle, because our pattern and tool departments are already working under a heavy overload. Even after a delay of from three to six weeks and sometimes longer, to make up pattern equipment, the malleable and bronze castings have to be secured with an additional delay ranging from three weeks to three months. Then there are manufacturing processes which vary in time, depending upon the design of the article. Altogether it is hard to state definitely what can be done with special articles, but it is certain that there will be long delays and expenses all out of proportion to the intrinsic value of the devices, compared with some similar standard articles."

DELIVERIES OF LARGE ORDERS

The third question put to the manufacturers was: "How are the production conditions for the shipment of a large order of construction material of standard catalog articles?" One manufacturer replies that a very large percentage could be shipped from stock if the customer would accept the manufacturer's recommendation for such material. Another says that production conditions in the plant are such that materials can be got out in thirty days, providing the raw materials for the make-up of the order are in stock, but if the order exceeded the supply of raw materials delivery would be contingent upon raw material deliveries which would be about as follows: "Malleable iron castings, six to eight weeks; structural steel, two to three months; Porcelain insulators, four weeks, and brass castings, three weeks."

Another manufacturer, discussing production conditions for a large shipment of line construction material, states: "Our stock of standard overhead materials is arranged with the idea of taking care of new construction requiring quantities often much larger than would be necessary for the average run of maintenance orders. Under the present conditions there are apt to be several items in a bill of material which are short for one reason or another, so that it is safer on the average construction job to figure on at least six or eight weeks' shipment."

This summary, based upon replies from large and responsible manufacturers, confirm the judgment of most electric railway line departments that in these times of rapid changes it is best, wherever at all possible, to confine their orders for line construction materials to articles of standard manufacture rather than to ask for special designs.

Car Building Plants Busy

Orders for 1917 Will Probably Exceed Those for 1916—Delivery Dates Difficult to Fix

Based upon the opinions of several car builders, and also upon the number and character of rolling stock items published weekly in this department of the ELECTRIC RAILWAY JOURNAL, the statement can assuredly be made that the car orders for the first half of 1917 will considerably exceed those for either half of 1916. The orders from the Eastern roads have been made up largely of city cars for service on heavily-traveled lines, while the Western properties have ordered many lightweight, safety (one-man) cars. One car builder recently made the statement that on account of the orders for light-weight cars already on the books, and for a number of other orders which are expected to be placed, he was confident that his company's business for 1917 would exceed that of any year since 1912.

PRICES AND DELIVERIES

Car prices are at least 30 per cent higher than the average for 1916, and the car builder's shops are now fairly well filled. Orders are also in sight for a substantial amount of business. Deliveries cannot be set definitely by the car builders, first on account of the raw material situation, and second because of the delay in the receipt of specialties. It is safe to say, however, that the car builder can now guarantee to build bodies and trucks within the time a purchaser can have the electrical equipment delivered for installation. There have been some notably long delays in the deliveries of cars caused by the inability of the roads to procure certain specialties or parts of the electrical or air-brake equipment. One car builder was forced to hold an order of several cars for three months simply for the reason that the gears were not delivered. This, of course, works a hardship on the car builder, because his money must remain tied up for this length of time without interest.

Reports indicate that the steel delivery situation is working out better than for the last twelve or fourteen months, but it must be remembered that car builders cannot now obtain options on raw materials as they did formerly. This applies principally to steel and iron. There is also a possibility that the government may require the steel makers to give preference to its orders, which in turn will interfere with production promises as already made by car builders.

The electric railways are paying their bills to the car builders better than for several years past, and very few cars are being ordered on the car trust plan, as has been the case in former years.

Electric Railway Purchasing Agents and Storekeepers Should Organize

By S. R. DUNBAR
Purchasing Agent, Union Traction Company of Indiana

I have noted with interest the consideration given the possibility of a Purchasing Agents' Association, in the "Manufactures and Markets Department" in the April 7 issue of the ELECTRIC RAILWAY JOURNAL, as well as the editorial on the subject. The editorial which suggests the advisability of the appointment of a committee of the Engineering Association rather than the organization of a separate Purchasing Agents' Association, strikes me as being a correct analysis of the subject. A separate association would meet with the difficulty of getting attendance at meetings. Then again, the purchasing agent's problems are so much those of other departments in his own company and of the section in which his company is located that the getting together of purchasing agents separately would not solve their problems as well as the problems of other departments of the industry are helped by association of the men in the companies concerned.

I have often thought about the matter and have not been able to get away from the two points raised above, that is, lack of authority with other departments to get things going in the way that the purchasing agent would prefer that they should go and the local nature of the purchasing agents' problems. Small local gatherings in different localities might be of value, but it seems hard to get even these started and kept going.

Price matters do not require much discussion, and information regarding them and where materials can be bought can be easily obtained by mail or telephone.

So I think co-operation of other departments with the purchasing department, and *vice versa*, can be best secured through the appointment of a committee of the Engineering Association to consider the purchasing agents' problems rather than through a separate organization.

Market Conditions Better

Conditions affecting labor in the East, around Pittsburgh and other neighboring points, are far more critical than the manufacturers' inability to secure raw material, according to W. H. Smaw, purchasing agent of the Georgia Railway & Power Company, who recently returned from a ten-day trip during which he visited Cincinnati, Cleveland, Pittsburgh, Mansfield, Ohio; Philadelphia and New York City. Mr. Smaw's statement is as follows: "The steel mills and other sources of raw products seem to have gone tonnage mad. They are interested in nothing but big items, bulk orders. Consequently, manufacturers of finished products are finding many difficulties in the way of getting the mills to accept their orders for special stuff. However, conditions are improving, instead of growing worse, as had been feared. Deliveries are getting better. War conditions may upset calculations to some extent, but it is my opinion that the disturbance will not be great among the items in which we are most directly interested. War will not affect labor conditions except favorably, and prices will not be allowed to run wild. I anticipate that the government will be able, through the enactment of regulatory measures, to see that there are no runaway markets and will control prices absolutely within maximum limitations."

Selling Costs Should Be Reduced

Better Co-operation with Railway Supply Men Needed—"Yes" or "No" Policy Advisable

BY L. W. HORNE
General Manager Horne Manufacturing Company, Brooklyn, N. Y.

That the electric railways should strive for better purchasing methods is very apparent in the minds of many railway supply men. Few purchasing agents or master mechanics realize that the selling expense on a good many articles is at the present time more than the manufacturing cost, and on all the accessories handled by this company it is almost equal to the manufacturing cost. The big railways are now endeavoring to anticipate their needs, but the small railways do not, or perhaps can not. The average railway makes a concern in the railway supply business waste a lot of time which ultimately has to be paid for by the railway. The master mechanic of an average road cannot take time or has not the facilities to write out his requirements unless he writes them out in longhand. When a railway supply man calls on the average master mechanic with whom he is acquainted the usual query is "Where have you been for the last six months? If you fellows would come around occasionally you might get some business. I wanted some of your stuff last month."

If this master mechanic stopped to think what the cost of a trip to New England, western New York or western Pennsylvania amounts to in comparison to twenty minutes' time and a 2-cent stamp, he would realize what increased selling cost in the form of traveling expenses means to the railway supply man. Orders from the small electric railways that in the aggregate would amount to considerable if the 2-cent stamp method were used, are too small to warrant personal solicitation of the supply man because of the exorbitant selling expense. If the railway supply man had a method of being informed by a railway company that it was going to be in the market for a small amount of material, the matter could be handled profitably to both.

With this idea in view, the Horne Manufacturing Company has sent out a postcard on which is listed a number of items, such as hand brakes, trolley catchers, trolley bases, wheel guards, copper, malleable or bronze castings, sand boxes and traps, etc., with a paragraph asking the master mechanic to check off the items in which he is interested or for which he is in the market and with instructions to mail this card in to the company. In many cases the master mechanic or superintendent of equipment does not see this card or any other advertising literature, because it is destroyed by some clerk in the department before it is called to the attention of the man actually interested. To this the railways answer that they get so much advertising literature that they cannot possibly pay attention to all of it. Nevertheless, the different manufacturing companies must send out expensive bulletins to all in order to catch those men that are interested in some of their products.

It is usually found that the more trips a railway supply man makes on the road the better success he has. That is, the more calls that are made on the same man the better chance the supply man has of getting the business. In fact, he may have to call four or five times before the general manager, purchasing agent or master mechanic even remembers him. The reason for this is that there are too many supply men personally soliciting business. Very often it is necessary for the selling agent to make three or four trips in order to close a comparatively small order. If the railway men would take a definite "yes" or "no" atttitude toward the railway supply man's products, this would be a different matter, but usually they will not give the salesman a definite "no," even when they have made up their minds absolutely that they will not use his equipment. Yet it is obvious that they could save themselves a considerable amount of time and save the selling agent a considerable amount of expense by telling him frankly that his product would not be used.

Whatever can be done by scientific buying or otherwise to reduce materially the cost of selling must ultimately have its effect on prices, and this should be of vital interest to both the railway man and the manufacturer or supply man.

Loose Leaf Literature vs. the Big Catalog

C. E. R. A. Standardization of Literature—Big Catalogs Not Always Kept—Engineers Prefer Late Data

By R. M. Hemming
Superintendent of Motive Power, Union Traction Co. of Indiana

I have read with much interest the article by Allan Bond, advertising manager of the Ohio Brass Company, in the ELECTRIC RAILWAY JOURNAL of March 31, 1917, page 623.

For many years past and at the present time I have been very enthusiastic over loose leaf publications in almost every form. Some years ago I had the pleasure of reading a paper before the C. E. R. A. on this subject. It was generally conceded that the installation of loose leaf publications was the common sense and practical thing to do whenever it was consistent except where the cost of producing in some special cases was prohibitive. I have particular reference to periodicals.

This is a matter of standardization pure and simple. I cannot see the common sense for such a tremendous variation of sizes of catalogs.

However, since the reading of the paper before the C. E. R. A. numerous concerns began immediately thereafter to change their method of publication from a solid binder to loose leaf. The loose leaf proposition should particularly appeal to all concerns at this time on account of the increased cost of paper and the cost of production in every way.

Mr. Bond speaks about many of the recipients of manufacturers' catalogs not having an office force or organization to make a loose leaf file practical. I cannot agree with him, as I think you will find as many solid bound catalogs go to the waste basket as you will find renewals or supplements to loose leaf publications. Mr. Bond is of the opinion that a solidly bound catalog, although known to the producer to be six months or a year old, is better than a loose leaf affair, whose up-to-dateness is unknown to either the owner or manufacturer that supplied it. Certainly there is every reason for the manufacturer who produces the catalog either solidly bound or loose leaf form to see that the date of its publication and its bulletin number are conspicuously printed thereon. I have received numerous solidly bound expensive catalogs that did not bear either a catalog number or the month or year when it was published. Therefore, a catalog of that type to me would be as good as obsolete and it will find its place in the waste basket. Any progressive engineer likes to be up-to-date and progressive and prefers to deal with a progressive manufacturer.

Much Track to Be Bonded in 1917

Notwithstanding the abnormal conditions of the copper market with the wire base about 39 cents, indications are that there will be more track rebonded during the coming year than during any year since 1912. Deferred maintenance work is responsible now for activity in the bonding field. Many roads have hesitated about putting their bonds in first-class shape because of the loss of revenue during 1913 and 1914 and of the high prices for material and labor in 1915 and 1916. Good operation demands that the bonding now receive attention, and the orders placed and in prospect confirm the manufacturer's opinion that 1917 will see more rail bonds installed than was done in any of the preceding five years. During the first few days of March, for example, one company received orders for more than 26,000 bonds. The greatest activity seems to be in the Atlantic Coast States, and this was true for the business placed during 1916 as well. The Pacific Coast roads did a comparatively large amount of bonding during 1915. Consequently, their orders for 1916 were small, but indications now are that considerable work will be done during 1916, particularly by the Pacific Electric Railway.

Some of the lines throughout the country which have undertaken or are actively considering comparatively large amounts of bonding work for the 1917 season include the Long Island Railroad, the American Railways Company properties, the Kansas City Railways, Lehigh Valley Transit Company and the Illinois Traction Company. The Canadian Northern Railroad is now installing 8000 bonds for its Montreal tunnel electrification project. These are being put on with the Ereco electric bonding equipment. Orders for the Central States interurban territory are not particularly large for any single property but show that bonding maintenance work is being planned for most all of the roads which have not overhauled their bonding recently. The Electric Railway Improvement Company recently shipped 7600 bonds by express from Cleveland to the Long Island Railway at New York. When it is noted that these were 32-in. 400,000-circ. mil. bonds, the size of the shipment will be recognized. These bonds were shipped by express because of the freight embargo on the Eastern roads.

Electrical Exports Doubled

For the seven months ended Jan. 31, 1917, the electrical exports of American manufacturers amounted to $28,217,968, compared with $15,638,569 for the corresponding seven months of the year previous. The increase here, which is almost 100 per cent, can be accounted for to a considerable degree by increase in prices. There has been, however, a marked increase in the demand of foreign markets for American goods. Conspicuous figures are those for insulated wire and cable and for motors. During the last year and a half the exports of these articles have been increasing almost constantly. In the last eighteen months insulated wire and cable has practically doubled in price. Even on this basis, though, there has been an actual gain in volume of wire exported. The prices of motors, of course, have increased to a considerable extent, but it is doubtful if the prices have increased to such an extent as to offset the apparent gain in exports.

CURRENT PRICES FOR MATERIALS

Quoted Apr. 12

Copper (electrolytic)	New York, 34 cents per pound
Rubber-covered wire (base)	New York, 39 cents per pound
No. 0000 feeder cable (bare)	New York, 39 cents per pound
No. 0000 feeder cable (stranded)	New York, 39½ cents per pound
No. 6 copper wire (insulated)	New York, 36½ cents per pound
No. 6 copper wire (bare)	New York, 39 cents per pound
Tin (straits)	New York, 54⅝ cents per pound
Lead	New York, 9⅜ cents per pound
Spelter	New York, 10¼ cents per pound
Rails, A. S. C. E., O. H	Mill, $40 per gross ton
Rails, A. S. C. E., Bess	Mill, $38 per gross ton
Wire nails	Pittsburgh, $3.20 per 100 pounds
Railroad spikes, 9/16 in. and larger	Pittsburgh, 3.65 cents per pound
Steel (bars)	Pittsburgh, 3¾ cents per pound
Sheet iron (black, 24 gage)	Pittsburgh, 5.35 cents per pound
Sheet iron (galv., 21 gage)	Pittsburgh, 6.55 cents per pound
I-beams over 15 in	Pittsburgh, 10 cents per pound
½-in. galv. extra high strength steel wire	New York, $7.04 per 100 ft.
⅝-in. galv. high strength steel wire	New York, $3.52 per 100 ft.
⅜-in. galv. Siemens-Martin wire	New York, $2.60 per 100 ft.
5/16-in. galv. Siemens-Martin wire	New York, $2.00 per 100 ft.
Galvanized barb wire and staples	Pittsburgh, 4.05 cents per pound
Galvanized wire (ordinary)	Pittsburgh, 3.85 cents per pound
Cement (carload lots) with rebate for sacks	New York, $2.12 per barrel
Cement (carload lots)	Chicago, $2.16 per barrel
Cement (carload lots)	Seattle, $2.60 per barrel
Sand in large lots	New York, 50 cents per ton
Waste, No. 1 white	New York, 14 cents per pound
Linseed oil (raw, 5-bbl. lots)	New York, $1.07 per gallon
Linseed oil (boiled, 5-bbl. lots)	New York, $1.08 per gallon
White lead (100-lb. keg)	New York, 10¼ cents per pound
Turpentine (bbl. lots)	New York, 50 cents per gallon

OLD METAL PRICES

Copper (heavy)	New York, 29 cents per pound
Copper (light)	New York, 24½ cents per pound
Red brass	New York, 20 cents per pound
Yellow brass	New York, 19 cents per pound
Lead	New York, 8 cents per pound
Zinc	8 cents per pound
Steel car axles	Chicago, $40 00 per net ton
Iron car wheels	Chicago, $22.50 per gross ton
Steel rail (scrap)	Chicago, $30.00 per gross ton
Steel rail (relaying)	Chicago, $39 per gross ton
Machine shop turnings	Chicago, $10.00 per net ton

Purchases for Foreign Tramways

Owing to the industrial conditions abroad on account of the war some of the European tramways are purchasing material in this country for current supplies. One of these is the Société Générale de Chemins de Fer Economiques, a large Belgian holding company, with headquarters formerly in Brussels but now in Paris (during the war). This company owns and operates electric tramways in Florence and

Milan and other places in Italy, Madrid in Spain, Cairo in Egypt, Damascus in Syria, in several places in France and Belgium, and in many other cities in Europe and Asia. The purchases are being made through Dr. C. O. Mailloux, consulting engineer, 20 Nassau Street, New York, who represents the concern here, and have included trolley wire, line materials, commutators, springs, steel-tired wheels, rails and other supplies, besides some repair parts for steam locomotives for steam tramway lines also owned by the concern.

ROLLING STOCK

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., is considering the purchase of cars.

International Railway, Buffalo, N. Y., is reported to have placed an order with the G. C. Kuhlman Company for cars with practically the same specifications as those of the fifty cars already ordered, details of which were printed in the ELECTRIC RAILWAY JOURNAL for March 31, 1917.

Lehigh Valley Transit Company, Allentown, Pa., noted in the ELECTRIC RAILWAY JOURNAL of March 24 as ordering twenty-four center-entrance, front-exit, double-end cars from The J. G. Brill Company, has specified the following details for this equipment:

Date of order	March, 1917
Delivery	During August
Builder of car body	Brill
Type	Center Entrance
Seating capacity	60
Weight (total)	42,000 lb.
Bolster centers, length	26 ft. 6 in.
Length over bumpers	47 ft. 0 in.
Length over vestibule	46 ft. 0 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base,	11 ft. 1⅜ in.
Body	All steel
Interior trim	Statuary bronze
Headlining	Agasote
Roof	Arch
Air brakes	West. S M E
Axles,	4½ in. A. E. R. A. Standard
Bumpers	Rico Anti-Climbers
Car trimmings	Statuary bronze
Control, type	HL.
Couplers	Tomlinson
Curtain fixtures	Curtain Supply
Curtain material	Pantasote
Designation signs	Keystone
Door operating mechanism	Brill
Gears and pinions	Westinghouse
Hand Brakes	Horne
Heaters	Cooper Hot Air
Headlights	94-watt incandescent
Journal boxes	Brill
Lightning arresters	GE
Motors, type and number,	4—West. 514A
Motors	Outside
Registers	International MMR5
Sanders	Brill hand
Sash fixtures	Brill
Seats, style	Brill
Seating material	Rattan
Springs	Brill
Step treads	Feralun
Trolley catchers	Ohio Brass
Trolley base	Nuttal No. 13
Trolley wheels,	Automatic Ventilator
Trucks, type	Brill 77 E-1
Ventilators	Automatic
Wheels (type and size),	Davis 26 in.

TRADE NOTES

Western Electric Company, Inc., New York, N. Y., announces the opening of a branch house at New Haven, Conn.

American Electrical Works, Phillipsdale, R. I., have sent out a notice to customers requesting that they return all reels and spools as promptly as possible.

William P. Bonbright & Company, Inc., announce the removal of their offices to the Equitable Building, corner Nassau and Cedar Streets, New York City.

F. C. Thomas has resigned as superintendent of the Canadian Tungsten Lamp Company to become re-associated with the Westinghouse Lamp Company at Bloomfield, N. J.

Johnson Fare Box Company, Chicago, Ill., has secured an order for 350 fare boxes of the double-dial coin and metal ticket registering type from the Denver Tramway.

General Electric Company, Schenectady, N. Y., announces the receipt of an order from the International Railway, Buffalo, N. Y., of three 2000-kw. and one 1000-kw. rotary converters with transformers and switching equipment.

Galena-Signal Oil Company, Franklin, Pa., through its secretary F. French Miller, announces that effective April 5, George A. Barnes has been appointed manager and F. R. Stakelum, assistant manager of the railway department.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has received an order from the Chambersburg, Greencastle & Waynesboro Street Railway, Waynesboro, Pa., for sixteen No. 514-C motors to be used on double-truck interurban cars.

Cities Service Company, New York, N. Y., at the annual meeting elected two new directors, J. C. McDowell of Pittsburgh and M. R. Bump of New York, to succeed A. Bevin and C. T. Brown. The stockholders approved the increase in the authorized preferred stock of $40,000,000 and in the authorized common stock of $10,000,000.

National Tube Company, Pittsburgh, Pa., is distributing photographs of a piece of 8-in. National line pipe which was subjected to a torsional stress of 713,000 in.-lb. This pipe, which resembles a twisted garden hose, weighs approximately 29 lb. per foot, and the walls are approximately 1/3 in. thick. This is quite a curiosity and many purchasers would not have believed that 8-in. pipe could be subjected to any extraordinary punishment.

Esterline Company, Indianapolis, Ind., announces the appointment of James G. Biddle as district sales agent for Esterline efficiency instruments for the State of New York and the New England States, with the principal office for this territory at 90 West Street, New York City. The home office of James G. Biddle, 1211 Arch Street, Philadelphia, Pa., has for a number of years been the sales agent of this company in eastern Pennsylvania and New Jersey, which is to be continued. The New York office is in charge of H. H. Sticht, resident sales engineer.

ADVERTISING LITERATURE

General Electric Company, Schenectady, N. Y., has issued bulletin X-263, "Automatic Substations Permit Larger Savings at Des Moines," which was reprinted from the ELECTRIC RAILWAY JOURNAL of Jan. 13, 1917.

Northern White Cedar Association, Minneapolis, Minn., has issued a bulletin of official specifications of the Northern White Cedar Association governing the manufacture and grading of white cedar posts, poles, etc.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., is distributing leaflet 2492-C on its reversing planer motors. These motors range in capacities from 10 hp. to 75 hp. and operate at 230 volts direct current.

Union Switch & Signal Company, Swissvale, Pa., has issued bulletin No. 87 on its forge shop, describing and illustrating the methods used in the manufacture of railroad forgings, gray iron, mild steel, brass bars and aluminum castings.

Peter Witt, patentee of the front-entrance, center-exit car, has issued a descriptive bulletin, "The Car Rider's Car," describing this car and the service it is performing on a number of lines. At the present time there are 311 cars of this type in service and 129 in the course of construction.

Delta-Star Electric Company, Chicago, Ill., has issued a carefully prepared booklet describing its high-tension equipment, including its wood tower and standard steel tower outdoor substations and auxiliary equipment. This includes pole-top switches, lightning arresters, carbon-tetrachloride fuses and choke coils. This eighty-page booklet contains more than 100 illustrations of typical installations of the above equipment. Several pages are devoted to fuse tests and a number of oscillogram records of these tests are given.

New Publications

1917 Income Tax Procedure. By Robert H. Montgomery. The Ronald Press Company, New York, N. Y. 461 pages. Cloth, $2.50.

The sales points of this book are its definiteness and authoritativeness. In other words, it answers clearly and positively ninety-eight out of every hundred questions that confront lawyers and accountants in dealing with the federal income tax. For this reason it should be a very valuable reference book to the electric railway auditor or attorney who has to handle the tax reports. The material in the book is well analyzed and indexed.

Mediation, Investigation and Arbitration in Industrial Disputes. By G. E. Barnett and David A. McCabe. D. Appleton & Company, New York, N. Y. 162 pages (without appendices). Cloth, $1.25, net.

This is a timely work on a subject of great importance in the electric railway industry, and the way in which the authors have explained the shortcomings, virtues and accomplishments of agencies for mediation, investigation and arbitration should prove interesting. The book presents detailed plans for the formation of both state and federal boards upon a voluntary basis with no powers of prohibiting strikes.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW
Published by the McGraw-Hill Publishing Company, Inc.

Vol. XLIX NEW YORK, SATURDAY, APRIL 21, 1917 Number 16

The President's Message

IN his proclamation of April 15, which is published in full elsewhere in this issue, President Wilson declares clearly that every individual has a duty to perform in the present emergency. The railways and their personnel are particularly mentioned. "They are the arteries of the nation's life," says the President, and he continues that upon the men who run these roads "rests the responsibility of seeing to it that these arteries suffer no obstruction of any kind, no inefficiency or slackened power." This work of transportation is the primary duty of the electric railway companies and their employees. It is necessary not only for the movement by the war department of troops and their supplies, but also for the transportation of the great industrial "service army," as the President calls it, which is working behind the lines. But there is much else that can be done by both companies and by their officers and employees. Some of these we have already mentioned, and we shall speak of others as opportunities for new means of service become apparent. Whatever plans are ultimately adopted for national defense and offense, much will depend, and in fact now depends, upon individual initiative. Let every company and individual do all that can be done to support the country in this emergency.

THE RIGHT MAN IN THE RIGHT PLACE

Even though we have now definitely engaged ourselves in the business of war, the period of "preparedness" is by no means concluded. It is clear, from the President's proclamation, that what is needed now is the organization and co-ordination of our resources in men and supplies. It is equally apparent that any man who is specially fitted for some place in the non-combatant organization should not be in the fighting line. It is still more obvious that even if he should be over the age from which recruits are likely to be drawn, his services should not be denied to the nation because of its lack of knowledge of his qualifications. In brief, the primary need of the hour is to get the right man into the right place. As a means to this end censuses of members have been taken by several national technical societies with the object of providing classified lists of specialists who will be available for the coming multitudinous activities of the government, and this phase of the preparedness movement has now extended to associations of less general scope than the technical societies, the plan of registration adopted by the Yale Engineering Association being the most complete and practical one that has come to our attention. Consequently, it seems proper to say that, in view of the vital importance of prompt organization of all of our country's resources—both men and material—every citizen who is worthy of the name should see that he is enrolled with some organization through which, if need be, the government may ascertain his qualifications and utilize them to the greatest benefit of our country. Several electric railways have already formed such registration bureaus, and it would be well if every one of them established qualification lists of their numerous employees.

$1,000,000 FOR JITNEY DAMAGE

The Winnipeg Electric Railway believes that there is a limit to which patience can be stretched. During the past two years it has paid to the city $545,747 for general taxes, percentage of gross revenue and pavement charges. It has also paid to keep the streets occupied by its tracks free from snow and a license fee of $20 per car—all this for the privilege of exclusive rights to carry passengers on the streets of the city. But the city has not kept its part of the agreement. It has permitted jitney competition, and the loss already suffered by the company amounts to $1,000,000. For this sum the company has just notified the city that it expects to be reimbursed for damages already suffered. It has also told the city that unless immediate steps are taken to stop further jitney competition the company will be obliged to consider refusing to pay any further sums as percentages of gross revenues, as taxes on its cars or as pavement charges. We are glad to see the company take this definite position. Of course these payments are only a part, and a very small part, of what a transportation company does for a municipality. If, because of jitney competition, a railway company is unable to make needed extensions or has to reduce its service in the outlying parts of a city, the injury to the community is much greater than would be the loss of the taxes paid by the company. But the enumeration of these taxes furnishes a very concrete statement of what the company is paying the city in cash and emphasizes the extent to which it is being injured by jitney competition. The city cannot reasonably expect both to tax privileges and at the same time not to grant them. We hope that the company will actually bring suit and that it will win its case.

THE MASTER MECHANIC'S CORNER Through the "Billy" Sunday campaign the song "Brighten the Corner Where You Are" has been made very popular. This advice has been applied too literally to the master mechanic, who is frequently expected to brighten up a very dingy corner. Although no longer subordinate, on many properties, to the transportation department, he receives a cubbyhole between the storeroom and the wheel pit for an office, far away from the company of his fellow department heads. The theory seems to be that as "master" mechanic he should always be on the job to show how much better he can handle a wheelpress or wash a window than any of his workmen. It is time for this view to be scrapped. The master mechanic should be a man who can discard the overalls, assume the title superintendent of equipment and apply his experience and intelligence to the analysis of costs in a modern office located in the building occupied by the other executives of the company. It is a financial crime that the men who are most responsible for great equipment expenditures should so often lack direct control of all vital upkeep statistics, of the power to decide what cars shall or shall not stay on the lines. The superintendent of equipment is too important in reality to be kept brightening some corner miles away from the office.

COST OF LOCOMOTIVE GEAR LOSSES Losses through friction in the gears used for increasing armature speed and reducing weight and cost of motors for electric locomotives seem generally to be estimated at 5 per cent, assuming a reasonably heavy loading. An approximately equal loss is accorded to the side rods which have been installed also on some American locomotives, both in direct-connected form and combined with a geared jackshaft. Based upon these figures, it would seem that a rather high price is being paid for the advantages that the respective constructions bring, although it may well be, of course, that the gains more than offset the extra expenditure for power. In round numbers it is possible for an electric locomotive to consume an amount of energy during one year whose value is just about half of the locomotive's first cost. To do this something like 100,000 engine-miles must be covered under load, and though none of the American electric locomotives has done this as yet, indications are that the figure will eventually be reached on the Chicago, Milwaukee & St. Paul Railway. Granting this possibility, the annual saving of the gearless type of locomotive over the plain geared type, when capitalized at 15 per cent, would permit an increase in first cost of 17 per cent, and about twice this figure when compared with the geared jackshaft type. This, of course, does not take into consideration the element of special track construction presumably required with the gearless machine. However, with the plain geared and geared jackshaft types, which seem to be about the same as regards track requirements, the former may cost 17 per cent more and still be on an equal basis, or say 10 per cent more under figures for annual locomotive mileage that have actually been recorded to date.

REGULATING THE HOLDING COMPANY

Holding companies owning a controlling interest in a group of scattered properties have thus far escaped the close scrutiny and regulation of public service commissions, which have confined their activities almost entirely to the subsidiary properties. Whatever effect state regulation has had upon the holding company has been the indirect result of the control exercised over the subsidiaries. Recent decisions of public utility commissions, however, have shown that this matter is receiving their attention, particularly as regards what should be considered a reasonable charge for expert management, one of the latest of these decisions being that of the Illinois Public Utilities Commission in the case of the City of Lincoln vs. Lincoln Water & Light Company (P. U. R. A., 1917 B., 1). In this case the corporation is controlled by a holding company which had imposed an annual charge upon its subsidiary for expert service in supervising operation and new construction. These payments were defended on the ground that they were a reasonable and proper operating charge, that they were not excessive in amount, and that they resulted to the direct advantage of the consumer through better service and high operating economies.

The Illinois commission held that the fundamental reason for the organization of a holding company is primarily for the protection of the financial interests involved. A considerable proportion of its expenses must be recouped out of the income which it receives from the dividends upon the stock of the subsidiaries which it manages. Such expenses constitute the cost of safeguarding the capital investment, and this cost cannot properly be saddled upon the utility's consumers. It must be borne by the owners. A holding company could collect from its subsidiary a reasonable charge for engineering and legal work, planning new construction and promptly instituting the latest practices in management and operating methods. How great this charge may be is a question of fact which will not be inferred by the commission but must be affirmatively established by conclusive proof based upon actual results. The burden of proof, in other words, is to be upon the holding company. It must show that it has rendered real service and that this service has resulted to the direct and unmistakable advantage of the public. No general rate can be established. Each case must be judged upon its own merits. In no event, however, will a larger charge be authorized than the expense to which the local utility would be put to secure similar expert advice and assistance in dealing upon a free, independent, competitive basis with outside engineering firms or management associations.

Heretofore little attention has been paid by holding companies when any of their subsidiaries went before the commission in rate cases, to presenting affirmative proof of the value of the service of a holding company and to the exact extent of the operating savings which it has effected. The commissions, in most states, have held that the public has a right to expect efficient operation and that the utility could not ask for an unusually favorable allowed rate of return merely because it was giving efficient service at reasonable rates. Where holding companies are charging utilities for services rendered, it would appear to be necessary to establish affirmatively, by comparison with other properties similarly situated in the same territory, and by such other methods as may be suitable, that the holding company has brought about unusual economies in operation and unusual advantages to the consumer. If this can be substantiated, it would appear that a reasonable charge will be sustained. Public utility managers must not infer, however, that the commissions will make inquiry on their own behalf as to whether such charges are justified. The burden of proof is on them, and if proof is not forthcoming the action of the Illinois commission would seem to indicate that regulatory bodies will not, on their own motion, collect proof to substantiate the equity of such payments.

A POSSIBLE WAY OUT OF THE FIVE-CENT FARE QUAGMIRE

There was probably never before a time when managers of electric railways were as perplexed as they are to-day. They see prices of rails, copper, of all materials, going up by leaps and bounds; they see the supply of labor becoming constantly more restricted and the stern necessity facing the men who are available to earn additional pay in order to meet their own increasing cost of living; they see taxes mounting upward in order that municipalities, and indeed the nation itself, may be able to meet the rising tide of expenditure. And, on the other hand, these managers see the 5-cent fare standing like a stone wall in any pathway toward a method of meeting the extraordinary burdens of the time.

The electric railway manager sees steel companies raising the wages of their labor, raising the dividends to their stockholders, and raising the prices of the products which they sell. They see even steam railroads applying to the Interstate Commerce Commission for an increase in freight rates, with considerable likelihood of obtaining it. And all the while that 5-cent fare remains—a source of despair and a barrier to hope.

When managers talk of reducing the number of transfers, the public protests. When an effort is made to be relieved of taxation, the public authorities object on the ground that street railroads should bear their proper share of the current burdens. The manager feels himself ground between the upper and nether millstones of an inexorable public sentiment, a sentiment which considers the 5-cent fare almost as sacred and inviolable as the Constitution of the United States.

This is an editorial of optimism. Everyone recognizes the difficulties. They are difficulties which are apt to become worse before the situation is greatly improved; they are difficulties which call for real statesmanship and for the exercise of an entirely new point of view in dealing with the public in street railway matters.

Street railway managers are doing the best they can against extraordinary odds. They know what these odds are, but the public does not. The public worships the 5-cent fare because it has always done so. It has come to believe that it has a right to street railway service at 5 cents a trip. The public hasn't seriously considered anything else.

How many railroad executives have made up their minds in this exigency really to put all the cards on the table and to trust the public? Continuance of the present situation means bankruptcy to very many companies. Such companies have therefore nothing to lose, they have everything to gain, by throwing aside the cloak of reticence and telling the public their whole story as they see it.

Street railway companies want to give service. The public must have the service. It is absolutely impossible that 6 or 7 cents' worth of service should be given, for 5 cents, at any rate for long. The public has every reason and every desire to prevent companies from becoming bankrupt. The American people can be trusted to be fair, once they know the facts. The facts in every case are different. There are perhaps some episodes in the life of every company which its officers would prefer not to have ventilated. But this is not the time for personal preferences; it is a time when a man who expects to accomplish anything real must dare. He must dare to do the right thing because it is right, and out of his knowledge that only by the public appreciating the facts as he appreciates and understands them, can a grievously menacing situation be rectified.

While fully recognizing that great halo of habit which has clustered around the 5-cent fare, we refuse to believe the American people will not agree to a 6 or a 7-cent fare, to the relinquishment of taxation, and to the alleviation of transfer burdens, where such can be justified by an examination of all of the facts. Conditions must be met as they are to-day, not as they might have been; not always, perhaps, as they ought to be; but as they are. It is a very practical situation confronting alike the companies and the public which they serve.

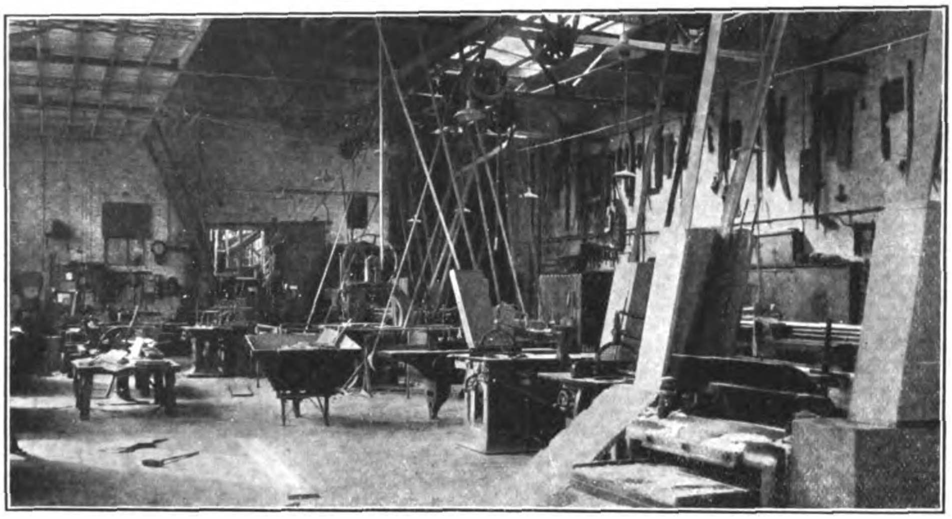
Let us make a concrete suggestion: Most of the companies would have to obtain alleviation from any burdens through the action of some regulating commission. Such commissions obviously could not do much in the face of an aroused and hostile public sentiment. Let the companies tell their stories to the public in advance of any appeal to the public service commissions for relief. Invite committees of representative citizens, representatives of the press, and people of complete independence of thought from different walks of life, to come into your office, examine your books and the facts surrounding your business, and report their conclusions to the public.

Let everybody see just what the conditions are which you face and how those conditions react upon the public which you serve. Then, having laid all the cards on the table, having told your story to the public as best you know how, go before your regulating bodies and ask for the relief which you feel in the interest of your service your company ought to obtain. We venture to believe that any such policy carried out boldly, frankly and aggressively will achieve results which will be as astonishing as they will prove effective.

West Penn Shops and Shop Methods

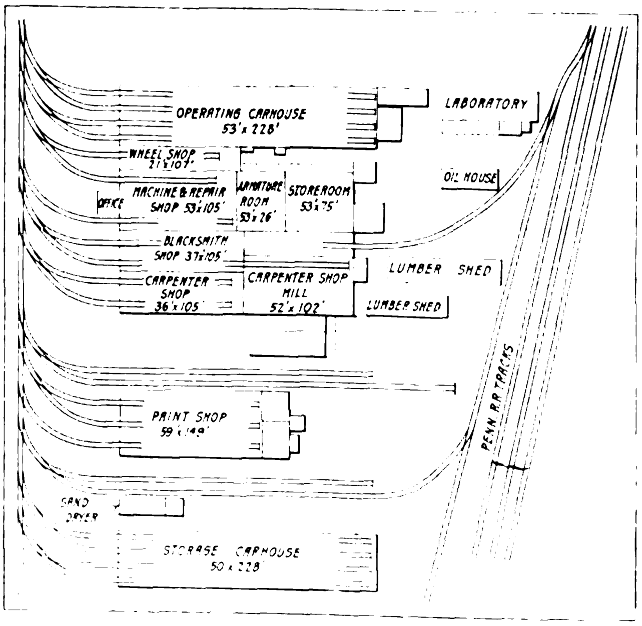
Inter-communicating Telephones, Color Scheme for Shop Furniture, Adequate Provision for Use of Compressed Air and Numerous Shop Kinks Add to the Efficiency of the Connellsville Shops of This Railway

By DANIEL DURIE
General Superintendent of Railway Operation, Territory A, West Penn Railways



CONNELLSVILLE SHOPS—FIG. 2—GENERAL VIEW OF MILL OF CARPENTER SHOP

THAT part of the West Penn Railways system in southwestern Pennsylvania in the vicinity of Pittsburgh comprises approximately 240 miles of track and operates about 215 cars. The principal repair shops are located at Connellsville. Here some of the cars have been built, and the rebuilding and overhauling of the cars of the entire system are handled at these shops. The accompanying diagram, Fig. 1, shows the general shop layout. This consists of a paint shop, a carpenter shop, a blacksmith shop, a repair and machine shop, an armature repair shop, a storage carhouse and an operating carhouse. The shops are wired throughout with 110-volt a.c. extension cord plug sockets, so that by using a 25-ft. cord it is possible to get a light at practically any part of the shop. This also provides a means of driving small portable machines equipped with alternating-current motors. All the shops and the general foreman's office are connected with an inter-communicating telephone system which has proved to be a great timesaver.

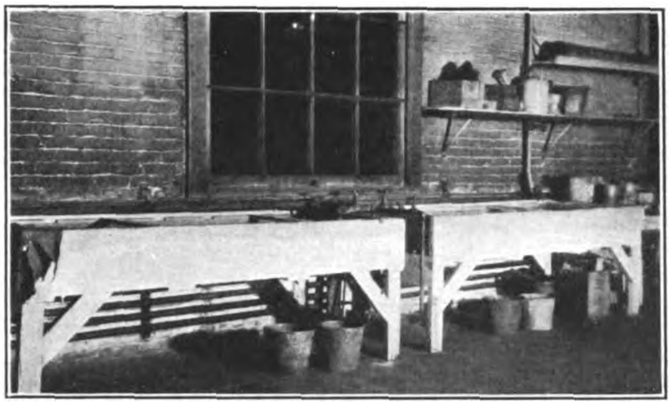


CONNELLSVILLE SHOPS—FIG. 1—LAYOUT OF TRACKS AND BUILDINGS

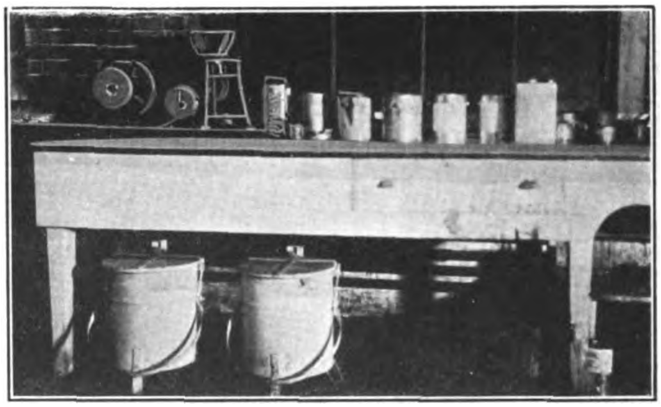
Another practical idea that has been carried out is the shop color scheme. All the walls are painted white or gray, but the furniture, that is, the ladders, wooden jigs, patterns and the like, are painted a different color in each shop. A great deal of the furniture is hung on the wall when not in use. This apparatus is all numbered, and the corresponding numbers are placed on the wall so that it is an easy matter for a workman to return an article to its proper place after he has finished with it. To keep the material off the floor and facilitate transfer from one shop to another, standard factory trucks are used. These trucks are also painted to indicate the shop in which they belong. This does away with a great deal of unnecessary labor, as the trucks are kept in their proper places, and when not in use are always within easy reach of the workmen. It will be noted that the storeroom is centrally located so that it can be conveniently reached from all the shops.

PAINT SHOP

The paint shop was designed and built during the summer of 1912. It is a modern building 54 ft. x 153 ft., of brick and reinforced concrete construction and arranged to accommodate six 55-ft. cars. It is divided into three sections, one for cleaning, painting and varnishing cars, one for varnishing doors, sashes and other parts, and the third for an office which is also used as a mixing room. The interior of the entire shop, in-



CONNELLSVILLE SHOPS—FIG. 3—WASHING TANKS



CONNELLSVILLE SHOPS—FIG. 7—PAINT-MIXING ROOM

cluding the furniture, is painted white, and it is well lighted by large windows and eight skylights. Artificial illumination is provided by Mazda lamps, there being two rows of 100-watt lamps arranged in clusters of seven, and two rows of 250-watt lamps arranged in clusters of eight. The walls have numerous hooks on which ladders, planks and the like are hung. The floor is of concrete and so graded that all the water will drain toward the track along which sewer drops are located every 30 ft. The arrangement permits washing cars in any part of the shop.

The ship I-beams which support the roof are used as the upright supports for the scaffolding which is necessary when painting or washing the sides of a car. This arrangement is shown in Fig. 12. There is a casting which fits around the I-beam and holds an arm which in turn supports the planks of the scaffolding. When not in use the scaffolding can be pushed up out of the way so as not to interfere with the other work in the shop. All planks which are not in use are kept on a rack built along the wall especially for this purpose.

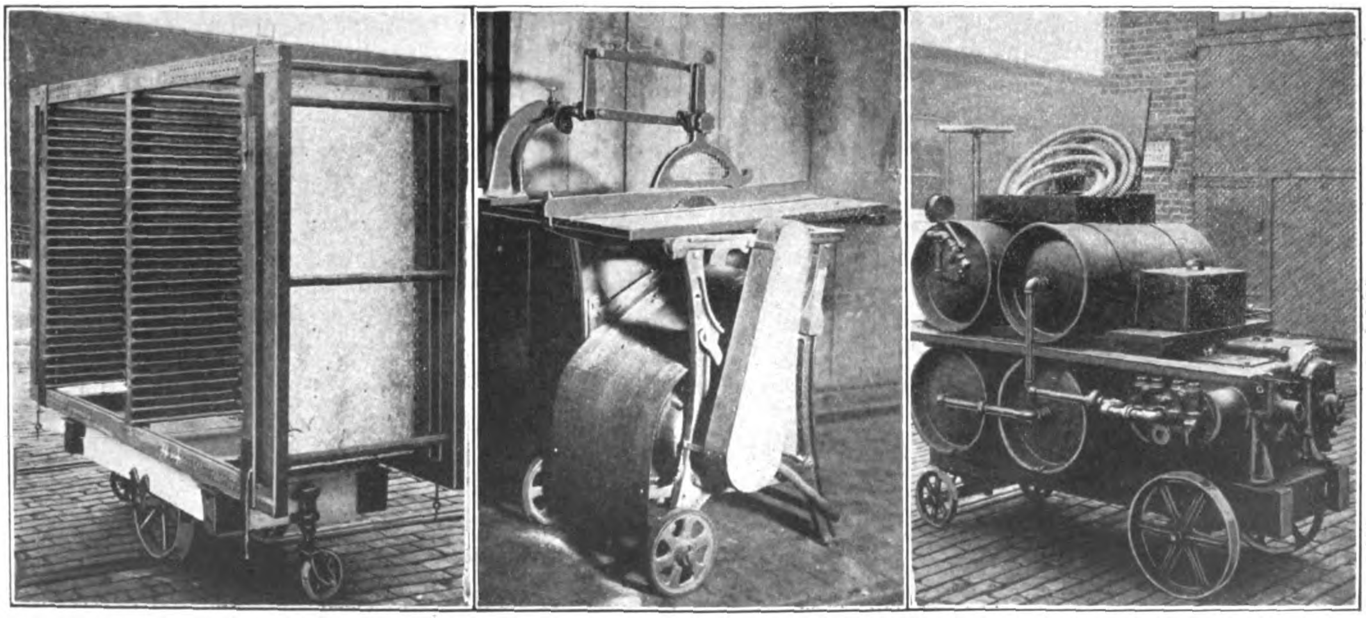
The door and sash-washing tanks as shown in Fig. 3 are large enough to permit the washing of a complete door without changing its position. The water in these tanks is heated by steam from the steam-heating system, and the tanks are arranged so that the water from them drains directly into the sewer. The window sashes are taken out of a car and put into a portable sash rack designed for the purpose. This rack, shown in Fig. 4, is permanently mounted on one of the standard shop trucks, so that it can easily be moved to any part of the shop. The sashes are kept in this rack until they are placed back in the car.

The heating system in the door and sash-varnishing room is so arranged that enough heat can be turned on to dry the varnish very rapidly, it being possible to get as high as 100 deg. Fahr. when the temperature outside is 10 deg. above zero. All the small parts are varnished on the bench shown in Fig. 9, which has a rack arranged so that the long pieces can be left to dry on the top section, the shorter lengths on the next section and the shortest on the lower section. As soon as a piece is varnished it is placed on the rack and thus the bench is kept free to work on at all times.

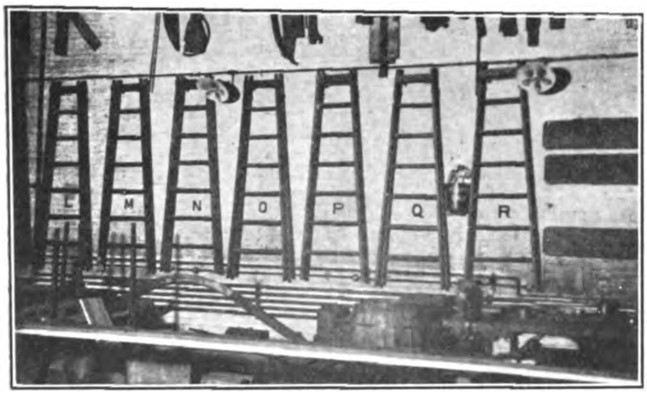
In the mixing room, shown in Fig. 7, supplies for each day's work are kept, while the remainder of the stock is stored in a small fireproof paint storage house directly back of the paint shop. To complete the paint-shop equipment there is a portable air compressor, Fig. 6, which was designed and built in our shops, an old air compressor and tanks from a car being used. This portable compressor has been found very convenient in the paint shop and yard. All the other shops are supplied with air from a large air compressor and storage tanks.

CARPENTER AND BLACKSMITH SHOPS

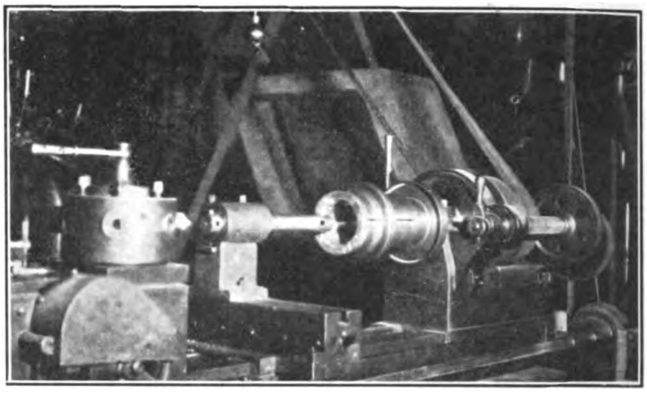
The carpenter and erecting shop is used for the purpose of building new car bodies and overhauling and rebuilding cars that have been in service. The interior of this shop is painted white, while the furniture is red. The building is divided into two sections, the front part being an erecting shop, and the rear section a mill.



CONNELLSVILLE SHOPS—FIGS 4, 5 AND 6—PORTABLE SASH RACK, BUZZ SAW AND AIR COMPRESSOR



CONNELLSVILLE SHOPS—FIG. 8—PORTION OF ERECTING SHOP WALL



CONNELLSVILLE SHOPS—FIG. 11—BEARING BORING LATHE SHOWING SPECIAL CHUCK

A portion of the erecting shop wall is shown in Fig. 8. where the manner of storing the furniture when it is not in use will be noted. A general view of the mill is shown in Fig. 2. It is equipped with all machines necessary in the building of new car bodies, and the machines help considerably in reducing the cost of repairs and overhauling work. It should be noted how carefully the belts, buzz saws, etc., have been safeguarded.

In addition to other portable machines in this mill, there is a trimming saw, shown in Fig. 5, which is driven by 1½-hp. single-phase motor. This saw can be used in any part of the shop and can be operated by plugging into any extension light socket, 110-volt alternating current being used. It is equipped with an approved guard, and all sizes of saws up to 10 in. in diameter can be used in it. It is used on all new car work and on most repair jobs and saves a great deal of hand work.

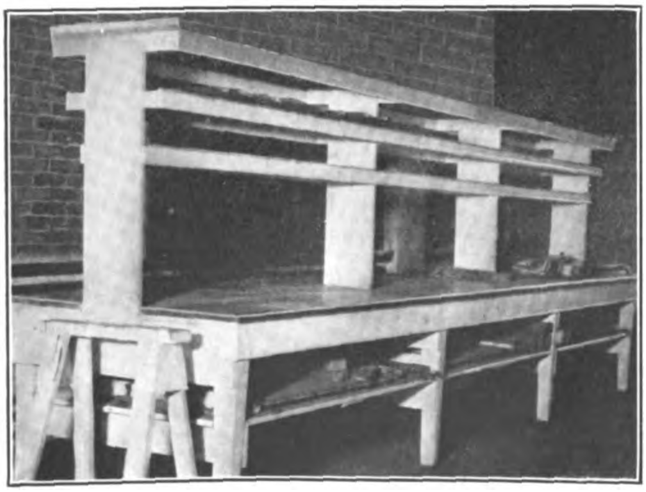
A screw cabinet located in the mill is shown in Fig. 10. Each different class of screw is kept in a compartment by itself, the shelves being carefully marked and the screws kept in tin boxes made up in the shop for the purpose. These tin boxes are marked to show the size of the screws, and it is the duty of the supply boy always to keep the boxes filled. In order to facilitate this the backs of the boxes are painted red. When a workman empties one he turns this around with the red side showing, so that it is an easy matter for a boy to find the empty boxes. This cabinet is locked at night by sliding an iron bar into position which catches the top of each door. The bar is locked in position by a padlock secured to one end.

The blacksmith shop is located between the repair and carpenter shops. Its walls are painted white and the furniture is black. It is equipped with three forges, a mechanically operated hammer, emery wheel, lathe, metal-cutting saw, large punch, shears and a steam hammer which is served by two gib cranes, each supplied with a 1-ton quick-acting chain block. Most of the electric welding is done in the blacksmith shop. It consists in building up armature shafts and axles, welding new ends on armature shafts, repairing gear cases and worn places on brake rigging and doing numerous other jobs. New gear cases are also made here and the electric welder is used in fastening the sections together. There is a portable oil tempering-tank and a fireproof annealing box in this shop, both being mounted on wheels so that they can be moved out of the way when not in use.

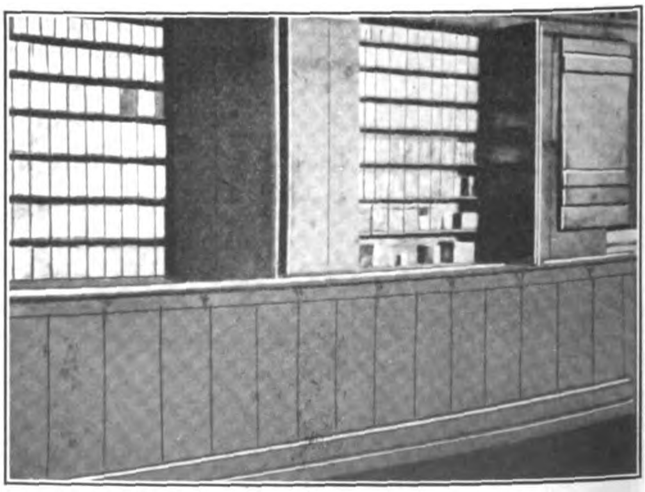
Repair and Machine Shop

The color scheme in this shop is gray. The pits are arranged so that most of the apparatus can be removed from a car and trucks and handled on the floor adjoining. Over one pit there is installed a hydraulic car-lifting hoist which will lift a complete car at one time, or it can be used to lift a truck in order to remove the wheels. The shop is also equipped with gib cranes which have air lifts.

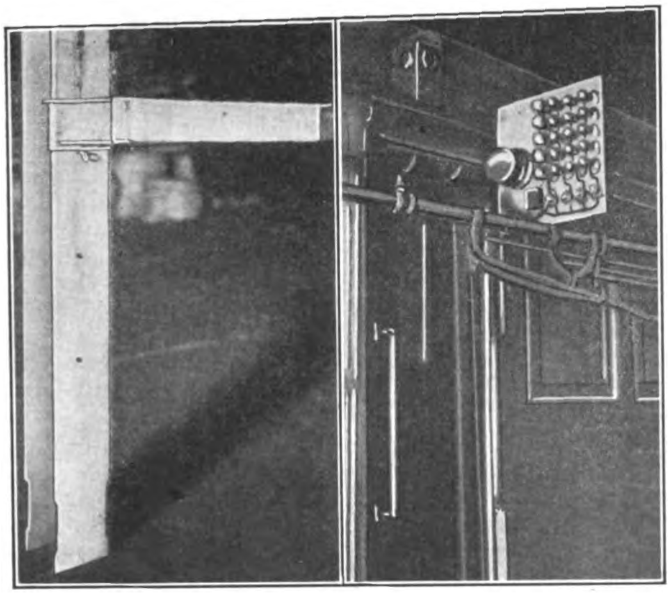
All bearings are bored in the boring machine shown in Fig. 11 which was made from an old turret lathe. To tighten the special chuck which is used to hold the bearing it is necessary only to turn the collar which runs on a tapering thread on the outside of the chuck. Two sizes of chucks are used, one 5 in. and the other 6 in. in diameter. Bearings under 5 in. in diameter and those between 5 in. and 6 in. in diameter are held by using a split bushing between the bearings and



CONNELLSVILLE SHOPS—FIG. 9—VARNISHING BENCH WITH DRYING RACK



CONNELLSVILLE SHOPS—FIG. 10—CABINET CONTAINING THE SCREW SUPPLY



CONNELLSVILLE SHOPS—FIG. 12—SUPPORTS FOR PAINT-SHOP SCAFFOLDING ATTACHED TO BUILDING COLUMN. FIG. 13—CIRCUIT-BREAKER TESTING BOARD IN OPERATING CARHOUSE

the chuck. These chucks, which have saved a great deal of time in boring bearings, were made in our own shops according to the design of the writer.

ARMATURE ROOM AND OPERATING CARHOUSE

The armature room, located back of the repair shop, has a green color scheme. All the motor and armature repairs for the entire system are taken care of here, and in addition the transformers used by the West Penn Power Company are repaired and rebuilt in this shop. There are several winding machines of West Penn design used in winding armature coils, transformer coils, and other coils that are sent to be rewound. This room is also provided with a lathe for turning commutators, a slotting machine, a large bake box and a banding machine of West Penn design. There are two gib cranes placed in close proximity to the lathe and armature horses so that very little work has to be lifted by hand.

The operating carhouse has four tracks and a capacity of 900 track-feet. It is equipped with an overhead motor-driven hoist for lifting cars. By means of worm gears an old railway motor drives a long shaft on each end of which is located a rope drum. Each of these drums is equipped with two rope blocks by means of which the car body is raised.

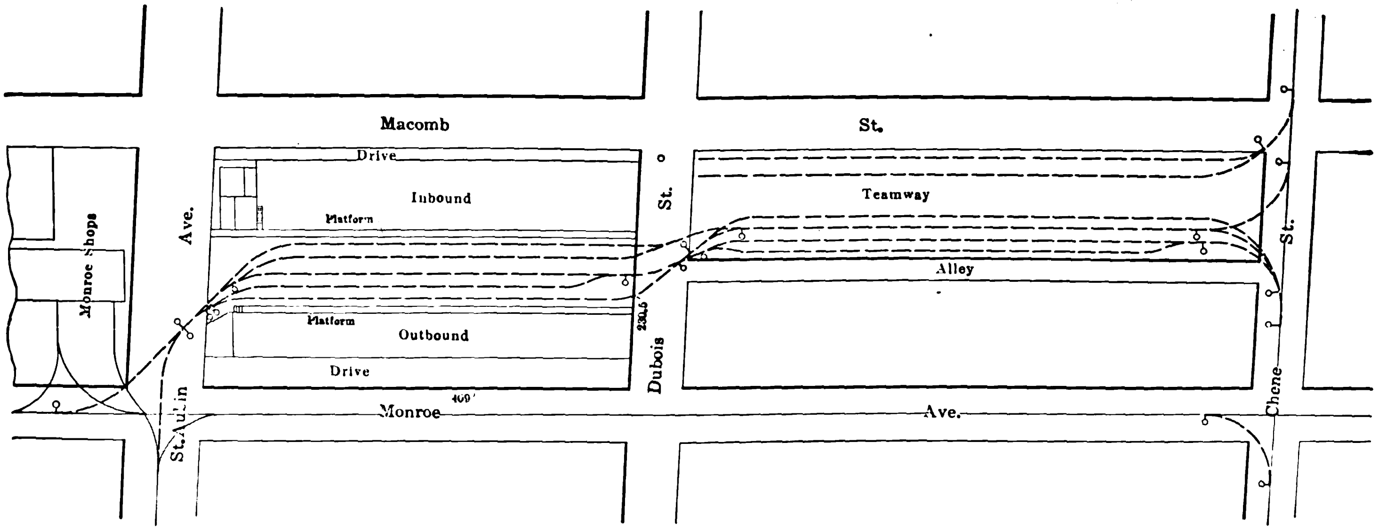
A circuit breaker testing board located in this operating carhouse is shown in Fig. 13. The current used in testing is taken from an old 6-volt electroplating machine. The leads from the field of this machine are brought to the bank of lamps mounted on the testing board, and by varying the field current with this bank of lamps it is possible to get a line current of from 200 to 1000 amp. for testing the circuit breakers. It is standard practice to test all circuit breakers at least every six months.

D. U. R. Begins Construction of New Freight Terminal

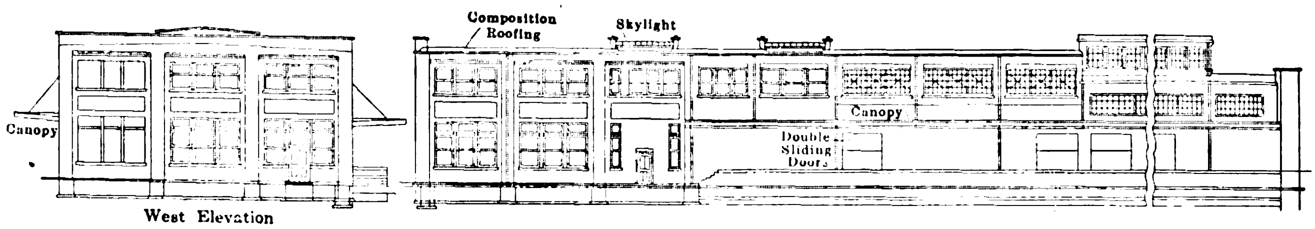
Increased Facilities Required by Large Growth of Business—Plans for Future Freight Terminal Expansion Also Provided

FACING the necessity during the last six months of placing embargoes on certain classes of shipments and of refusing more freight than could be accepted owing to the lack of terminal facilities and equipment adequate to handle the volume of traffic presented, the Detroit United Railway has begun work on a new freight terminal on the East Side at Monroe Avenue and St. Aubin Avenue, which will increase the present facilities about 400 per cent. This includes the construction of an inbound and an outbound freight house, 409 ft. long, with tracks between and driveways on the street sides of the two buildings and, in addition, several team tracks where loading from wagons or trucks directly into cars or vice versa may be facilitated. The layout covers one city block and one-half of another, as shown in the accompanying drawing. The space between the two buildings allows for five tracks, the center one of which will be used for the switching of cars, leaving two inbound and two outbound service tracks. The six tracks for team-track service adjacent will be utilized, three tracks for loading and unloading and three for car storage. The total capacity of the layout will approximate 150 cars in and 150 cars out a day, whereas the present facilities will accommodate only ninety cars in and out a day.

The new terminal is to be located on property adjacent to the old Monroe shops of the company, which, following the recent removal of the carpenter shop to the new Highland Park shop location, will be used as an interurban inspection station. This property will ultimately be used, however, for the expansion of the freight terminal. In addition to this new terminal, the company has just purchased two city blocks



DETROIT FREIGHT TERMINAL—GENERAL PLAN OF TERMINAL



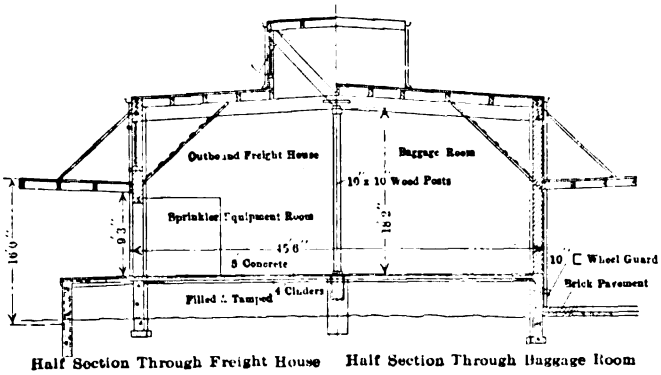
DETROIT FREIGHT TERMINAL—ELEVATIONS OF INBOUND FREIGHT HOUSE

containing 6½ acres between Fort and Lafayette and Fifteenth and Seventeenth Streets for a future West Side freight terminal. Probably no buildings will be erected here for two years, or until the present new terminal is overloaded, and no definite plans for the layout are yet drawn up.

BUILDINGS AND EQUIPMENT

The two buildings at the new Monroe Avenue terminal designed by Smith, Hinchman & Grylls, Detroit, will be of mill-type construction with brick walls and monitor roof, and with mastic asphalt on concrete floors. The west 145 ft. of the inbound building will be two stories high and will be used for office purposes. This portion of the building will also contain a locker and wash room and a lunch room for the employees, a 30-ft. x 46-ft. hot and cold room, record storage room, etc. The west end of the outbound freight house is to be used for a 20-ft. x 45-ft. baggage room and a 26-ft. x 28-ft. hot and cold room.

Each building will be equipped with a monorail and hand-operated chain hoist across the building, and each will have three 3500-lb. platform automatic weighing scales installed. A dry-line sprinkler system will protect the buildings and contents from fire. An 8-ft. platform will be built along the team sides of the two buildings, leaving a 30-ft. strip between this and the property line along the outbound house and a 9-ft. strip along the inbound house for driveways.



Half Section Through Freight House Half Section Through Baggage Room

DETROIT FREIGHT TERMINAL—SECTION THROUGH OUTBOUND FREIGHT HOUSE

Along with these new terminal facilities which will greatly increase the efficiency of handling freight and make very prompt release of teams and trucks possible, the company is also providing more rolling stock. Fifteen new freight trail cars and two freight locomotives with large motor equipment, two freight cars equipped with motors, and four freight drawing locomotives are on order.

The Southern Public Utilities Company after trying out two one-man cars on the lines of the Anderson (S. C.) Street Railways, has found that the average total operating expenses for the first five months of one-man car operation were only 5.7 cents per car-mile as compared with 13.2 cents for the same period of the previous year when the two-men cars were operated.

Trolley Freight Would Reduce High Cost of Living

Massachusetts Commission Recommends Extension of Trolley Electric Freight Service to Reduce Living Expenses

SEVERAL interim reports as well as a final report on the cost of living have been presented to the Governor of Massachusetts by the committee of five appointed to consider the means for reducing living cost in Massachusetts. Among the other causes for the present conditions the commission finds the lack of facilities for freight transfer and distribution, and it devotes one of its preliminary reports to the relation of transportation to prices. In this report it says, in part:

"Along with other transportation matters trolley freight has also been neglected. The only trolley freight terminals that exist in Boston to-day are inadequate. We recommend, therefore, that in any plan which is adopted for dealing with the transportation of freight, provision be made for trolley freight terminals. The development of our trolley freight service has been slow. Our fish trade, for example, has been handicapped by the delay in the development of trolley freight service. We ought to have trolley express carrying fresh fish daily from the Commonwealth Flats fish pier back through the main lines of travel, all the way across the State of Massachusetts to New Hampshire and down into Rhode Island and Connecticut.

"To promote our trolley service for the transportation of all sorts of merchandise a change in our legislative policy is essential. Because of obstacles placed in the way of the street railway companies, the expansion of our trolley freight service has been carried on in a piecemeal and petty way. The development of the steam railroad in its early days was hampered and delayed by the theory of local rights. Presently it was discovered that the rights of everybody were more important than the rights of anybody. Local authorities to-day cannot block, delay or in any way control steam railroad operations. The contrary is the case in trolley freight matters. It has been a long, harassing and disheartening process to get local permission to do any trolley freight business at all. We have been told there are places in northeastern Massachusetts that still refuse permission. The obstacles put in the way of spur tracks, sidings and other facilities have added greatly to the delays in developing the field. Apparently there are members of city and town governments who do not yet appreciate that whatever makes transportation and distribution more costly than it need be for the individual is ultimately a cost to all of us—for the consumer pays the bills.

"The time has come to treat trolley freight service like any other freight service, by putting all its details, except the construction of terminals, under the control of the Public Service Commission, and we advise legislation to that end. We also advise such change in the statutes as may give the Public Service Commission power to authorize and foster, with due regard to public convenience, the carriage on electric railways of any and every form of merchandise and material."

Practical Results in Publicity Campaigns

Two More Incidents Which Demonstrate the Value of the Personal Touch in Relations with the Public—That Personal Touch Is the Real Miracle Worker

By CHARLES T. HEASLIP
New York City

The cases of Cooper and Brown described this week show clearly that the public is reasonable if reached directly and apprised fully of the facts. The personality of the executive head of the utility is the key to the solution of the problem of public relations.

IN last week's issue of the ELECTRIC RAILWAY JOURNAL the writer related some instances illustrating his contention for a realization of the above-mentioned principles. Bancroft, the reader will remember, was a man who had the personal touch, Smith on the contrary lacked it. In the little town of Bridgeville, which is located about 300 miles west of Smith's town, is another lighting and traction company that is operated by a general manager of a distinctly different type. We will call him Cooper. Cooper is of the modern school and believes in the same principles as Bancroft does. But he is handicapped by many things—inadequate equipment, watered stock, inability to get money out of his stockholders for needed improvements except by threatening to resign, and a community that has more natural-born "kickers" in it to the square foot than any town I've ever visited. Yet when you go out riding with Cooper, your arm gets tired responding to the friendly salutes that greet him from all sides. And when his company needs anything from the public—a new right-of-way, a franchise renewal, etc.—it gets it. That is, Cooper gets it!

HOW COOPER GOT HIS FRANCHISE

When I first met him he had just taken charge of the recently-merged traction and lighting companies of Bridgeville, and he was campaigning for a new right-of-way and a franchise for a street car line that contained big possibilities because of the factories and mills which were opening up in the territory it proposed to tap. The right-of-way was being acquired easily, because of the promised increase in value to the property through which it ran, but the granting of the franchise was being fought by a group of citizens in another part of town who had been clamoring for years for an extension through their territory. They wanted their extension built first.

Cooper had called me in to run an educative advertising campaign in the local papers that would enable him to get the facts in the case before the public, and he gave me strict orders to see that nothing but facts were presented.

"These kickers in the northern end of town have some justification for 'hollering' because we are trying to build this other extension first," he said, "and I want them to know that we are not decrying them. I simply want to show them that it will be to the mutual benefit of the city and the company to have this other extension built first."

It was along those lines that our newspaper campaign was conducted. But Cooper did not stop there. He organized meetings right in the heart of the kickers' district and addressed them personally. These meetings were a revelation as to what can be accomplished with an unfriendly public by a street car manager who is "on the square." Yet Cooper was no orator; he did not attempt to harangue his audiences. He just told them in a simple man-to-man way what the company's position was and what it would like to do. And he succeeded in working up a personal sympathy for his own aims and ambitions that eventually won the day for him. Here is a sample of one of his talks:

"I have been brought here to help build up the street car company so that its service will eventually become adequate to the demands which the rapid growth in population here is making upon it. But that is a job that cannot be done over night; neither can it be done by me alone. I need your co-operation.

"I appreciate the rights of you citizens of this district for an extension of the Fourth Street line, and I want to give it to you. But I shall be better able to get the necessary money for that extension from my company if you will first permit me to build the extension through the new factory district, for that is a sure money-maker. Once in operation its receipts will help make up the deficit which an extension in your district here would be certain to show for the first year or two. But I pledge you my word that if you will withdraw your opposition to this new line, I will have your line built and opened within a year."

No one could listen to Cooper as he made that pledge without believing him, and this faith was justified later when, immediately following the opening of the factory line, he had ground broken for the "kickers'" extension.

GOOD RESULTS FROM THE CLAIM BUREAU

But that is only one phase of Cooper's power. He keeps a complaint bureau open day and night for both his traction and lighting companies. And no one is ever sent away dissatisfied. Along in October, when the daylight hours become appreciably shorter, electric light bills naturally begin to grow bigger. Perhaps Mrs. Jones hasn't thought about that; anyway, her October bill of $2.55 looks a whole lot bigger than her September bill, which was only $1.70. So she hustles over to Cooper's complaint bureau with it.

Does the affable young clerk there "jump on her" and suggest that she ought to be glad that her bill isn't $5, what with all the entertaining she has been doing and the new electric washing machine she has been using? He does not. He just smiles pleasantly and says: "That is a jump! Let's investigate."

Then he takes down a chart showing the total amount of electricity used by the company's consumers for the month of September, and also one for the month of October. A comparison of the totals shows that there has been an average increase of about 15 per cent in the amount of "juice" used during October as compared with September.

"Longer nights, you know," he explains. "But at that your bill ought not to have jumped 50 per cent. Suppose I send one of our inspectors around to see if your meter is registering properly."

By that time Mrs. Jones herself has usually remembered the extra entertaining done in October or the regularity with which the new washing machine has been used, and she is reconciled to her bill. But if she isn't, the inspector goes around and tests her meter, and if he can get Mrs. Jones or her husband to watch the test and listen to his explanation of it, he does so. For it is the general manager's orders that the public shall be educated into the mysteries of the electric lighting business on every possible occasion. His theory is that the more they know about it the less cause they will find for complaints.

There is one step more in Mrs. Jones' case. If by any chance her meter is running too fast an estimate is made at once of the extra current for which she has been charged, and if she has already paid her bill a refund check for the difference is sent to her by the next mail. When I have told some general managers of this scheme they have held up their hands in holy horror and branded Cooper as an extravagant fool for wasting a 2-cent stamp on a check that may amount to only 15 or 20 cents.

"Why not take it off next month's bill instead?" they chorus.

But Cooper, who has not studied the psychology of the public in vain, does not worry about the extra 2-cent stamp, nor the additional trouble in making out the check.

"Those little checks make us friends," he says, and then adds with a chuckle, "and as an advertising medium they're in a class by themselves!"

Cooper's friendship-building plans also include lunches every week or so with the leading business men, politicians and newspaper men of the town. Sometimes he is host, and sometimes he just drops in at a table around which they have congregated at the City Club. But always he manages to get in a word or two about what the company is doing—why the new track is going to be laid on Third Street; when the new cars are coming, or just what benefit the double-tracking of Main Street will accomplish.

Occasionally (for service on certain of his street car lines is not consistently good, owing to lack of funds to maintain the equipment) a group of "kickers" will get together and "raise a howl" for more cars during the rush hours. On two occasions of which I know there was no chance of giving them the extra cars, but that fact did not induce Mr. Cooper to crawl into his shell and maintain a dignified silence. Instead, he got permission to use the schoolhouse in the district affected for a "neighborhood meeting," at which he addressed the "kickers" and told them just what he was up against.

A REAL TEST OF THE MANAGER'S HOLD ON THE PUBLIC

Now there are some general managers who could not get away with such a stunt. But Cooper has built up such a reputation for honesty and frankness in the community that, as one of his admirers put it, "he could get away with murder!"

He did once—that is, it was "murder" from the street car man's standpoint. He induced about 100 of the property owners along one of his lines to let him tear up the tracks along four whole blocks and transfer them to another street for the betterment of service to the other patrons of the line, who were in the majority. When people will consent to such a proposition, which meant walking a block out of their way to get a car that formerly ran in front of their doors, you may be able to get some slight conception of Cooper's power in that community. And the miracle of it is that he accomplished it merely through the agency of two "neighborhood meetings."

Just one word more concerning Cooper. He appreciates the power of the press and realizes the value of a newspaper man's friendship. Consequently, when there is any news concerning his company—whether it be an accident or something of a favorable character—he always sees that the reporters are taken care of. No newspaper man has ever knocked at his office door in vain or been turned away without having all of his questions answered fairly, fully and frankly. The result is that no newspaper article "roasting" the company has been published since he took hold.

He also uses the advertising columns of the newspapers occasionally. But he is not a wasteful advertiser. He leaps into print only when he has something to say that is of real interest. For instance, if he has to rebuild a half mile of track in the business section, and the work promises to result in some delays and inconveniences to the public, he buys a quarter-page in the local papers and explains the situation to the public. He tells them why the track has to be rebuilt just at that time, and the benefits that will result from it. And he concludes by apologizing for whatever annoyance it may cause. Sometimes he adds the whimsical request that the public be "as considerate as possible" in its opinions of the company while the repair work is in progress.

It would be foolish to assert that all of Cooper's and Bancroft's ideas would work out as promptly and effectively in a metropolis as in the small cities in which they operate. In big cities there is a wider gulf between the public and the public utility official who is striving to serve it. It is not so easy for him to go out and rub shoulders with the people. Moreover, because of the activities of the sensational press in all big cities, the public utility man there is looked upon with more intuitive distrust and suspicion than his brethren in the smaller towns. He represents the capitalistic class and it is harder for him to work up a friendly audience.

Yet there are a number of public utility officials, even in the larger cities, who have learned that at heart the public means to be fair. To be sure, it is brutally unreasonable at times and will work up a grouch against a street car company or a lighting company—or any other form of public utility—for the most picayune of reasons. But rising supreme over the grouch spirit, which is usually only temporary, is a true instinct for fair play.

Bancroft has found that out; so has Cooper. And by their "personal touch" methods they have found a way to reach it. Hundreds of other public utility men in all parts of the country are experimenting along similar lines. They are the thinkers—the executives with imagination—the ones who eventually will bring about such an ideal relationship between the public utilities and the public that the politicians will be hooted down when they try to picture the honest local utility as a "grasping monster that is trampling the rights of the dear peep-ul underfoot."

THE MANAGER NEED NOT BE AN ORATOR

Of course, not all of the thinkers and experimenters have either Bancroft's personality or Cooper's faith and self-confidence, but they are all on the right track, and sooner or later they will find the way to solve their specific problems. There is Brown, for instance. Brown is general manager for a light, heat and power company in the Middle South. While planning a franchise campaign for him recently, I told him about Cooper's neighborhood meetings.

"It's a great idea," he said, adding regretfully "I wish I could face an audience without getting stage fright. I'd do it myself on this franchise."

I argued with him that a man did not have to be an orator to make a speech, but Brown knew himself better than I did. He knew he could not make a favorable impression upon an audience and there was no convincing him to the contrary. But the idea had taken root, and within a few days it sprouted in the form of a proposition from him that we supplement our newspaper "talks" concerning the franchise with the services of a few good spellbinders who would establish themselves in little sidewalk booths in the business district and explain the franchise to all who cared to stop and ask questions.

By advertising this "stunt" well, the men in the booths did a rushing business, and when the franchise finally went to a vote of the people, so many of the voters understood it that it was carried with a goodly majority.

Like Brown, there are probably many public utility officials in this country who are afraid to get out themselves and address their consumers or patrons. Some of them are too self-conscious, perhaps, and others too proud. Yet neither of those personal reasons should prevent them from developing some form of "personal touch" relationship with the community they serve. If they can't do it themselves—they should do it through the men in the organizations, through talks in the newspapers, or through both.

But behind all pledges which are made to the public should be the assurance of performance, for the experiences of some public utility companies have proved that if a company does not actually intend to be "on the level" it might better adhere to the old "sit-tight" policy and say nothing.

When a company places itself on record to perform a certain obligation, it will assuredly increase its enemies in the community if it comes out with blustering pledges and then promptly forgets them after it has secured the favor for which it has been campaigning.

The ideas set forth in this and preceding articles are not theories. They are based on facts garnered by one who has helped work up favorable public opinion for public utility companies in all parts of the country, who believes in the power of truth-telling and publicity.

The slogan to-day is, "The public be told!"

C. E. R. A. Committee Changes

Several Changes in Committee Membership Were Made and New Committees Were Appointed

BROWN BOOK NO. 7 of the Central Electric Railway Association, the Central Electric Traffic Association, and the Central Electric Railway Accountants' Association, has just been issued. It shows a present membership in the railway association of sixty-seven interurban lines with a mileage of 4890, and two city lines. The traffic association has fifty members with a mileage of 4314.

The following changes in the committees of the railway and traffic associations from the lists printed in full in the issue of the ELECTRIC RAILWAY JOURNAL for April 1, 1917, page 649, were given in the Brown Book:

Central Electric Railway Association.—Irwin Fullerton and H. H. Bullitt retire from the auditing committee, leaving a membership of three; C. L. Henry and W. S. Rodger replace C. N. Wilcoxon and G. O. Nagle on the committee on constitution and by-laws; William H. Bloss becomes chairman of the committee on hotels and arrangements, in place of L. J. Drake, who, with T. H. Henkle, retires, while W. D. Hamer, F. R. Coates and John Benham become members; James H. Drew becomes chairman of the meeting registration committee, in place of W. D. Hamer, and A. M. Wilson is added to the committee; F. I. Hardy replaces C. D. Emmons on the committee on rules governing the interchange of equipment; W. E. Rolston replaces P. J. Wood on the standardization committee, and J. F. Layng and K. A. Simmons are added to that committee; G. G. Roberts takes the place of L. J. Drake on the supplymen's committee; J. C. Schade replaces C. F. Franklin on the transportation committee; and W. A. Carson retires from the track and roadway committee, while J. J. Geringer and L. J. Miller are added to it.

Central Electric Traffic Association.—The auditing committee changes are as in the auditing committee in the preceding list: J. F. Keys and J. H. Crall are added to the committee on joint passenger traffic; J. R. Steinbach replaces W. D. Stansifer on the joint freight tariffs committee; J. H. Crall replaces J. M. Brick on the official interurban guide committee; C. Frantz replaces F. I. Hardy on the committee on rules governing settlement of freight claims; and N. Rumney takes Mr. Hardy's place on the committee on joint weight and inspection bureau.

NEW COMMITTEE C. E. R. A.

Military Efficiency and Defense.—A. W. Brady, chairman, president Union Traction Company of Indiana; J. F. Collins, general manager Michigan Railway; F. R. Coates, president Toledo Railways & Light Company; W. A. Carson, manager Evansville Railways; George Whysall, general manager Columbus, Marion & Bucyrus Railway; W. H. Bloss, Ohio Brass Company; L. G. Parker, Cleveland Frog & Crossing Company; S. D. Hutchins, Westinghouse Traction Brake Company.

NEW COMMITTEES C. E. T. A.

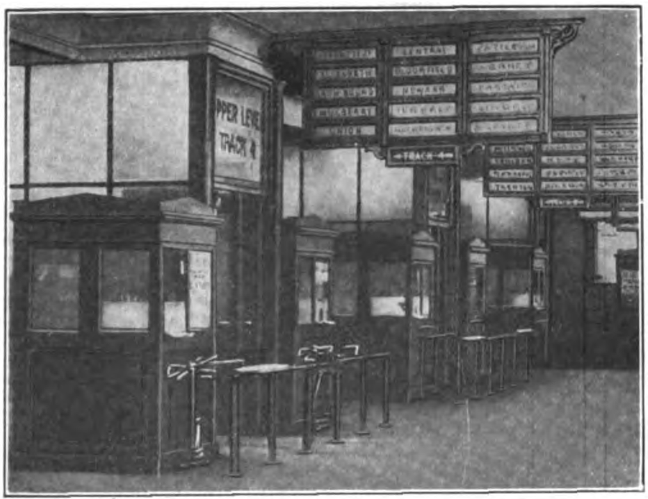
Official Classification.—W. S. Whitney, chairman, general freight and passenger agent Ohio Electric Railway; J. A. Greenland, general freight and passenger agent Fort Wayne & Northern Indiana Traction Company; N. Rumney, general freight agent Detroit United Lines; F. D. Norveil, general freight and passenger agent Union Traction Company of Indiana; C. J. Laney, traffic manager Cleveland, Southwestern & Columbus Railway.

Storage and Demurrage.—C. O. Sullivan, traffic manager Western Ohio Railway; J. A. Greenland, general freight and passenger agent Fort Wayne & Northern Indiana Traction Company; N. Rumney, general freight agent Detroit United Lines.

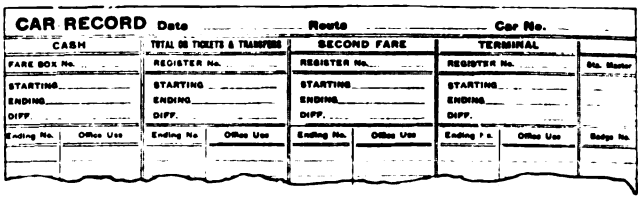
A Remarkable Safety Record

During the last nine years the Chicago Elevated Railroads have carried 1,500,000,000 passengers without a single fatal accident on trains. The number carried last year was about 300,000,000. A recent issue of the *Elevated News* calls attention to the fact that during the nine years mentioned the Elevated Railroads have carried a number of passengers almost equal to the population of the world. The safety work of the Elevated Railroads is highly organized and the record mentioned above is being used to stimulate further interest on the part of employees.

The Chicago, Ottawa & Peoria Railway, Ottawa, Ill., on April 15 dedicated a flag and a new 50-ft. steel flagpole at the Ottawa shops to three of the company shop employees who are members of the local military company. At the time these boys were called to the Mexican frontier the company could not show its appreciation of them, and has taken advantage of the occasion of their new call to service to acknowledge its esteem for them. The local military company and the high school cadets gave an exhibition drill. The cadet band furnished the music. The public was invited to attend.



CHANGE BOOTHS AND TURNSTILES AT ENTRANCE TO PUBLIC SERVICE TERMINAL ELEVATED TRAIN FLOOR STAIRCASES



CAR RECORD Date ________ Route ________ Car No. ____

CASH		TOTAL OF TICKETS & TRANSFERS		SECOND FARE		TERMINAL		
FARE BOX No.		REGISTER No.		REGISTER No.		REGISTER No.		Sta. Master
STARTING ENDING DIFF.		STARTING ENDING DIFF.		STARTING ENDING DIFF.		STARTING ENDING DIFF.		
Ending No.	Office Use	Ending No.	Office Use	Ending No.	Office Use	Ending No.	Office Use	Badge No.

NEW FORM OF CAR RECORD USED BY THE PUBLIC SERVICE RAILWAY

New System of Fare Collection in Public Service Terminal

Traffic in Newark, N. J., Terminal Has Doubled in Few Months Necessitating Use of Turnstiles and Change Booths

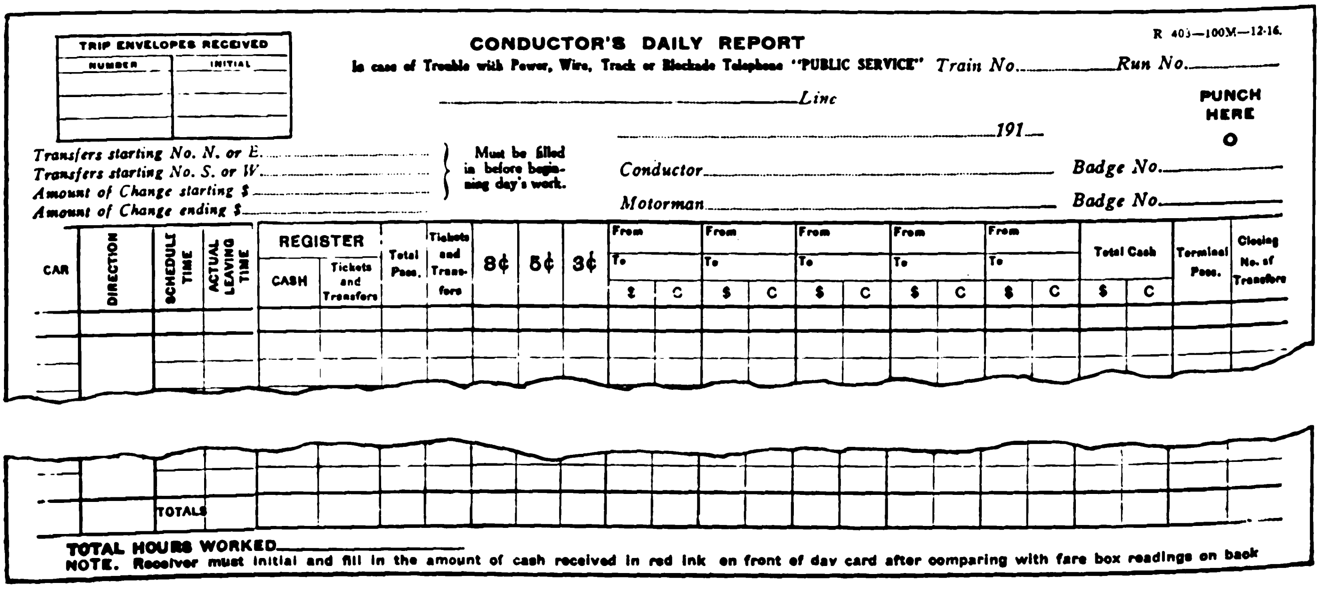
Beginning April 1, the Public Service Railway, Newark, N. J., has been using in the terminal on Park Place a new system of fare collection and transfer issuing. Referring to the articles describing this terminal which appeared in several issues of the Electric Railway Journal during 1914, 1915 and 1916, it will be noted that passengers enter the concourse floor from the street, passing from this floor to the elevated train floor and the subway floor by a number of stairways, each leading to the appropriate loading platform. Up to April 1 passengers boarding cars in the terminal paid their fares to conductors and received their transfers on entering the cars exactly as when they boarded from the street. The speed of loading was thus limited by the ability of the conductor to perform the double duty demanded of him, but as long as the traffic through the terminal was moderate this delay did not prove serious.

Traffic checks taken at intervals of a few weeks have indicated a rapid growth in the number of passengers entering and leaving the terminal, showing that at present between 50,000 and 60,000 use the building daily. This is an increase of about 100 per cent in eight months, and as the summer traffic increases there is sure to be even a larger use of the terminal. When the open cars begin to go through the terminal, as they will within a few weeks, passengers within easy reach of the terminal will naturally board there in order to get a first choice of seats.

After studying several possible plans for collecting fares on the concourse floor and the train floor, and with the aid of the various devices available, the management concluded to locate two turnstiles as well as two change booths at each stairway entrance, one for continuous use and the other for a few hours' use during the rush periods. These are in charge of girls during the day and of men at night. To indicate clearly the lines reached by the several staircases illuminated signs visible from a considerable distance were also installed near the entrance to each. There was no question in the mind of the management that the new arrangement would be entirely successful in the Newark terminal, as the prepayment plan had been used for years in the company's three-deck terminal at Hoboken.

In order to provide a check of the terminal traffic a special "terminal" register was installed on each car and the conductor rings up the number of passengers entering his car in the terminal. As this is all that he has to do, a car can be loaded very rapidly and there is no excuse for the missing of fares even with the long open cars. On leaving the terminal the conductor locks the "terminal" register in order that no other fares can be registered thereon. To expedite loading all openings are utilized as entrances in the terminal.

A new form of car record and day card on lines having two or more fare zones was necessary under the new plan. This form is shown in an illustration reproduced



TRIP ENVELOPES RECEIVED	
NUMBER	INITIAL

R 403—100M—12-16.

CONDUCTOR'S DAILY REPORT

In case of Trouble with Power, Wire, Track or Blockade Telephone "PUBLIC SERVICE" *Train No.*________ *Run No.*________

________ *Line*

________ *191*__

PUNCH HERE
○

*Transfers starting No. N. or E.*________
*Transfers starting No. S. or W.*________
*Amount of Change starting $*________
*Amount of Change ending $*________

Must be filled in before beginning day's work.

*Conductor*________ *Badge No.*________

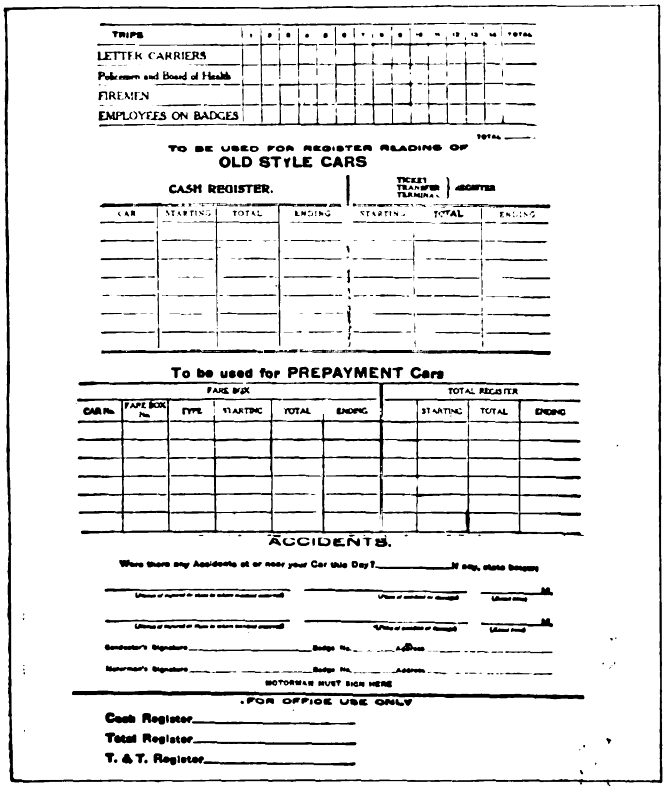
*Motorman*________ *Badge No.*________

CAR	DIRECTION	SCHEDULE TIME	ACTUAL LEAVING TIME	REGISTER		Total Pass.	Tickets and Transfers	8¢	5¢	3¢	From To		From To		From To		From To		From To		Total Cash		Terminal Pass.	Closing No. of Transfers
				CASH	Tickets and Transfers						$	C	$	C	$	C	$	C	$	C	$	C		
		TOTALS																						

TOTAL HOURS WORKED________
NOTE. Receiver must initial and fill in the amount of cash received in red ink on front of day card after comparing with fare box readings on back

FACE OF CONDUCTOR'S DAILY REPORT, PUBLIC SERVICE RAILWAY herewith. A conductor enters in the appropriate space the number of fares shown on the "terminal" register on each trip. In making entries on the car record he enters only the ending number on the register. No transfers are issued by conductors to passengers boarding cars in the terminal, this duty being performed entirely on the concourse floor.

Among the advantages of the new plan, in addition to the quick loading and the positive collection of fares, an important one is the control of the number of people on each of the several loading platforms. If the platforms tend to be overcrowded, through excessive density of traffic or a blockade on one or more of the lines, the passengers can be held on the concourse floor where there is ample space. During the few days that the scheme has been in operation it has produced very satisfactory results, which indicate that one effect will be a very considerable increase in the capacity of the terminal.



TRIPS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL
LETTER CARRIERS															
Policemen and Board of Health															
FIREMEN															
EMPLOYEES ON BADGES															

TOTAL ______

TO BE USED FOR REGISTER READING OF
OLD STYLE CARS

	CASH REGISTER.			TICKET TRANSFER TERMINAL REGISTER		
CAR	STARTING	TOTAL	ENDING	STARTING	TOTAL	ENDING

To be used for PREPAYMENT Cars

FARE BOX						TOTAL REGISTER			
CAR No.	FARE BOX No.	TYPE	STARTING	TOTAL	ENDING		STARTING	TOTAL	ENDING

ACCIDENTS.

Were there any Accidents at or near your Car this Day? ______ If any, state below:

______ ______ ______ M.

______ ______ ______ M.

Conductor's Signature ______ Badge No. ______ Address ______

Motorman's Signature ______ Badge No. ______ Address ______

MOTORMAN MUST SIGN HERE

FOR OFFICE USE ONLY

Cash Register ______

Total Register ______

T. & T. Register ______

BACK OF CONDUCTOR'S DAILY REPORT, PUBLIC SERVICE RAILWAY

The slight rerouting of cars through the terminal necessary in order to prevent possible misuse of the transfer privilege by passengers was put into effect without confusion.

Eighty officers and employees of the Puget Sound Traction, Light & Power Company were guests of the company at a dinner at the Washington Annex, Seattle, on April 4. Those present in addition to the officers and department heads were members of the various safety committees of the company. Discussion of the evening had to do with the educational work of the company and the safety committee in accident prevention. F. M. Hamilton, superintendent of the department of accident investigation of the company, presided at the dinner, and speeches were made by A. J. Falkner, J. Harrisberger, L. W. Henderson, J. D. Nice and A. M. Lee. Mr. Lee is assistant general claim agent of the Northern Pacific Railway. He took for his subject the work of steam railways in accident prevention.

Results of One-Man Car Operation

One-Man Car Operation on Fifty Railways Shows Reduction in Accidents and Maintenance of Schedule Speed

THE results of one-man car operation on fifty electric railways in the United States and Canada have been tabulated by The J. G. Brill Company and, since this number represents about 40 per cent of the companies which are operating one-man cars, it gives an excellent chance to review the results of operation of these cars.

Of the fifty companies represented in the tabulation the Hot Springs Street Railway reported the earliest operation of one-man cars, which was in 1895. In all except eight of the companies the one-man cars installed replaced two-man cars. The general operating results are reported as satisfactory, practically without exception, while public opinion has been favorable with a few exceptions. One case of adverse public opinion was reported and four cases where adverse criticism was encountered only at first. Political and labor troubles have been slight. In regard to the saving resulting from one-man operation all but one company reported a considerable saving, some gave 50 per cent in labor cost and one railway gave a saving of from $4,000 to $5,000 a year on five cars. On twelve railways the receipts increased, and others reported receipts from 10 cents to 18 cents per car-mile. In three out of twelve cases of jitney competition it was reported the one-man cars had been effective in overcoming this competition.

The accident report was strongly in favor of the one-man car. Platform accidents were either reduced or there were none at all; other accidents were rare and their number was reduced. No new kinds of accidents were reported. It was practically the unanimous opinion that the undivided responsibility of the motormen tended to reduce accidents, and that the absence of the conductor as a witness in case of accident was a trivial matter.

Neither the schedule speed nor the headway seemed to have been materially changed by the new operation. However, six railways reported lower schedule speeds, and a like number were giving more frequent service.

In regard to the car details, all of the companies used the front entrance and exit construction. Vestibule doors were used in all but three cases, and folding steps were used in the majority of cases. These two facts undoubtedly account for the reduction in the number of platform accidents. A mirror was provided to enable the motorman to watch the interior of the car in a few instances, and in three cases the use of the dead-man handle was reported, whereas air brakes were used on sixteen roads of the fifty reported. The majority of the roads operated cars of the double-end type.

The pay-as-you-enter system of fare collection was common to all lines except one which reported a pay-as-you-leave system. Fare boxes were reported on all but thirteen roads, and on four roads change was put up in packages. On one-half the roads the motorman was allowed to start the car before collecting the fares.

The question of the motorman seemed to raise no difficulties in the case of one-man car operation, since very few of the men prefer the two-man cars or object to collecting the fares. In many cases they get a small increase in pay and labor troubles were reported only in three cases. Some companies thought it was easier to maintain discipline and to select the good men when using the one-man cars, but in most cases these two factors were not changed.

The practice of using two-man cars in place of one-man cars during rush hours had not been extensively adopted among the roads reporting, but this was done in a few instances and a few railways used one-man cars in residential sections and two-man cars in business districts during the rush hours. The use of fare collectors at busy points was reported only in one instance.

The following table shows the classes of service for which fifty railways use one-man cars. It indicates that the one-man car is not at all limited to branch-line service:

Class of Service	Number of Railways
All lines	21
Main lines only	10
Branch lines only	4
Shuttle service only	4
Main and branch lines	7
Main and shuttle service	1
Branch line and shuttle service	1
Main line, shuttle service and owl car operation	1
Not classified	1
	50

Regarding railroad crossings, it appears that a few are safeguarded with automatic safety devices, and in some instances a full stop only is required before proceeding across the railroad tracks, but in most cases a flagman is used or the motorman flags, these two practices being about equally common. No one reported trouble due to race prejudices, the races being separated on about half the railways reported.

While the answers to the various questions are not conclusive in most cases, they yet show the extent to which the problem is working itself out, and indicate that the railways consider one-man car operation a success as far as it has been tried. Furthermore they are trying to extend the operation where the opportunity affords itself.

Methods Used in Making Changes in Schedules

BY C. D. SMITH
Superintendent of Schedules and Time-tables Mahoning & Shenango Railway & Light Company, Youngstown, Ohio

THIS company recently made a schedule change in a manner which had some novel features. The line, 15 miles in length, for which the new schedule was made was one on which the traffic has increased at an enormous rate. The line serves a people whose industrial activities are in the steel mills, the unprecedented boom of which has taxed the transit facilities of all of the company's lines. Conditions on all these lines have been closely studied and the service readjusted to relieve the congestion as rapidly as analysis of the traffic could be made.

In the case of one line, the larger portion of which operates on single track, the analysis proved that in order to provide proper local service in the territory contiguous to the city and mill districts, and at the same time offer attractive interurban transportation, it would be necessary to divide the service into limited and local operation.

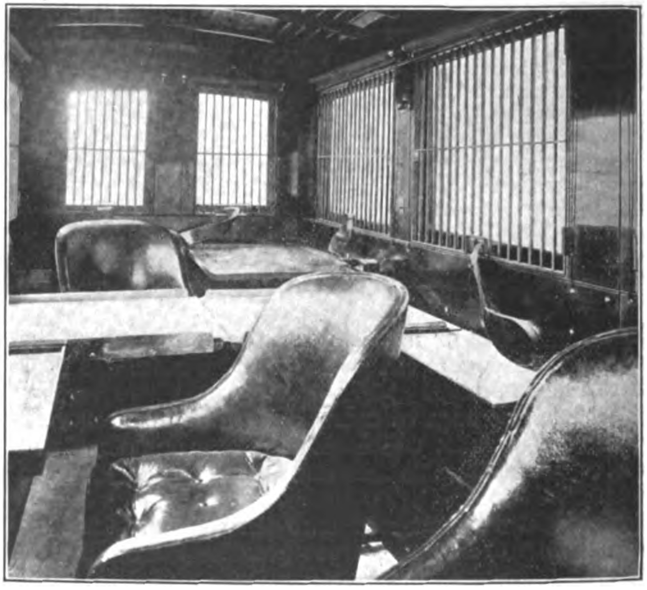
The inauguration of limited service necessitated the elimination of stops in the territory where local service was to be provided, the limited stops being spaced about a half mile apart for a distance of 5 miles in local territory. It was anticipated that such an elimination of stops might cause claims of personal inconvenience, but the superior and more frequent service eliminated such complaints, and the line now operates in the rush hours on schedule time and without congestion.

It was desired that this new service be put in operation in the shortest time possible after the decision as to the character of service was made. A function of this routine was the provision of operating schedules for the trainmen who previously have received blueprints of effective schedules. The new schedule was of such a size that if it was reproduced in blueprint form it would be both cumbersome for the trainmen to carry and expensive for the company to provide.

It was found that to have the schedule printed would cost $65, though it did not contain the detailed typesetting necessary on some interurban schedules. It was estimated that blueprints of the new schedule would cost $22, even if it was desirable to print such bulky schedules. So it was finally decided to have the original copy of the new schedule photographed, and a reduced-sized zinc plate made, from which prints could be obtained. The original schedule was about 18 in. x 50 in. and the prints made from the zinc plate were 8 in. x 28 in., the cost being only $18 for 150 prints.

Chicago Surface Lines Have Safe and Convenient Pay Truck

THE Chicago Surface Lines are using a motor truck with a specially designed body to carry the pay envelops to its employees at the carhouses and outlying districts. In some cases the truck merely transports paymasters and large sums of money from one carhouse to another, but trips of several miles are often made into the country to pay off line and track men and gangs engaged in special construction work such as the building of new bridges, tunnels, buildings and general track work.



PAY TRUCK OF CHICAGO SURFACE LINES

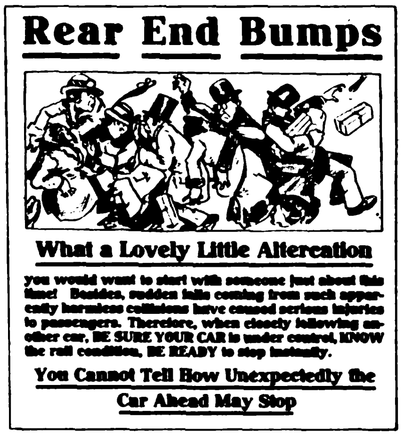
Accommodations are provided for four paymasters, a chauffeur and a guard, all of whom go heavily armed. The body contains all office conveniences. The paymasters are provided with swivel chairs and work at tables which hang on hinges so that they can be dropped down when not in use. The table in the center of the office is used for making up payrolls while the truck is en route. Within easy reach on either side are shelves for money trays.

In paying direct from the truck the chief paymaster sits at the extreme end of the office, takes the pay envelops from the shelf and passes them out to the workmen through a wicket in a window on his left. While the men are receiving their money the guard stands on duty in the rear of the office and the chauffeur guards the front. The windows are protected by iron bars and are connected with an alarm system. When the truck is traveling through the streets all money and other valuables are carried in a special steel vault in the body of the truck behind the rear seat. The truck was built by the White Company, Cleveland, Ohio.

N. S. C. Safety Poster

The accompanying illustration, which tells its own story, is reproduced from a recent poster prepared by and issued under the auspices of the electric railway section of the National Safety Council. The principle illustrated in the cartoon applies not only to the case cited in the lettering below the drawing, but also to less urgently sudden stops and to starts as well.

The lesson taught by this poster is one of the most important and apparently the most difficult for motormen to learn. Having knowledge of an approaching quick stop or start, they can brace themselves, whereas the passengers, not having this knowledge, who happen to be standing, are apt to be thrown violently.



Rear End Bumps

What a Lovely Little Altercation

you would want to start with someone just about this time! Besides, sudden falls coming from such apparently harmless collisions have caused serious injuries to passengers. Therefore, when closely following another car, BE SURE YOUR CAR is under control, KNOW the rail condition, BE READY to stop instantly.

You Cannot Tell How Unexpectedly the Car Ahead May Stop

ATTENTION-COMPELLING POSTER OF THE NATIONAL SAFETY COUNCIL

Railway Builds Tunnel to Reduce Grade

The Caracas (Venezuela) Electric Tramway, operating in the city of Caracas, has also a short interurban line running to the small town of El Valle. It leaves the city on a heavy grade ranging between 6 and 8 per cent for a distance of about 1650 ft. followed by a descent for 980 ft. In order to reduce this gradient, the company is constructing for the exclusive use of cars a tunnel about the length of the heavy grade which will give a uniform ascending gradient of 2 per cent.

To obtain the necessary height for the trolley wire and at the same time prevent the use of the tunnel by foot passengers, the section chosen is that of an elongated oval. The geological formation along the line of the tunnel is schist, limestone and compact clay, all of sufficient cohesion to enable the excavation to be made without timbering. Exposure to the air, however, causes disintegration, and it is necessary to line the arch above the point of the greatest width. After the arch has been lined the remainder of the core can be removed without danger.

The excavation is being made on the Belgian system, commencing with a top heading which extends to the lower limit of the lining. The bench thus formed serves as a platform where all the work of mixing the concrete and building the forms is carried on. The sectional area of the inside of the tunnel is 19.75 sq. yd. and about 1.2 cu. yd. of concrete is required per linear foot of lining. Electric cars, taking direct current from the 500-volt trolley, haul the excavated material to a near-by lowlying property owned by the company, and power for a hoisting crane for the concrete is also taken from the trolley. The use of power from the same source is contemplated for running concrete mixers and compressors for rock drills.

Reducing the Auditor's Worries*

Denver Tramway's Auditing Department Explains to Platform Men the Difficulties Arising from Lax Recording Methods

BY C. E. BUEHLER
Auditing Department, Denver (Col.) Tramway

In order that platform men may appreciate fully the close relation that exists between Ohmer sheets,† trip sheets and transfer envelops, it is necessary for them to comprehend the daily routine of the auditing department, beginning with the return of a car after its final trip. If care is exercised in carrying out recording instructions, a great percentage of the auditing difficulties will be obviated. However, the careful keeping of records appears to be of secondary consideration on the part of platform men, and the problem of lessening this evil should be met by systematically instructing these employees and thereby gaining their good-will.

The Ohmer sheets are removed from the registers after the final trips and sent to the auditing department. An impression is taken of an old sheet before removing from the register and also of the one for the next day so that the conductors' sheets may later be checked.

When the sheets arrive at the auditing department they are sorted according to lines and car numbers. This is the beginning of the auditor's difficulties. The sorter then looks over each sheet to find the changes in line numbers. If at each line change double readings have been taken, one with the original line number and a second with the following number, the sorter may readily separate the sheets between the two readings. If, on the other hand, only one sheet is taken and a conductor registers a few fares on the new line before noting his error, the trip sheets must be referred to with a corresponding loss in time. When the records are correctly kept, the trip sheets are gone over independently and checking with the Ohmer sheets is only necessary at the end of a run. It is, therefore, very important that Ohmer sheets and trip sheets correspond as to time, line and line number, and also that sheets for trailers check with those of the motor cars.

Accurate recording in the fare columns is important, as otherwise an "end reading" may not correspond with the "commencing" of a relief man. This laxity in recording may lead to "shortages" that are frequently adjusted only with difficulty and with inconvenience to the employee.

There are many other details of record keeping which are equally important, such as notes on trip sheets and envelops, and coasting envelops. Platform men should be made to realize the need of careful recording and their co-operation should be won by systematic instruction. A false impression that the auditing department is their natural enemy should be removed, but this may only be accomplished by first explaining the difficulties arising from lax recording and the reasons for the necessity of making more legible records.

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*Abstract of a paper read before the local company section of the American Electric Railway Association.

†The Ohmer Universal register by which the records mentioned by Mr. Buehler are produced was described in the issue of the ELECTRIC RAILWAY JOURNAL for July 17, 1915, page 113. The record sheet gives the date, time, direction, car and line numbers, total number of passengers, tickets, transfers and passes, total cash collected and identification number. Each conductor and inspector uses his identification key, the number of which is recorded on the record sheet. When an inspector at night, or a conductor assuming charge of a car, takes a duplicate reading with a different key, the printing counters turn to zero with the exception of the total passenger and total cash counters.

War-Time Conditions and the Electric Railways

The Entry of the United States Into War Raises a Wholly New Set of Problems for the Electric Railway Industry to Face—Some of These Questions and the Solutions That Have Been Adopted in Certain Cases Are Discussed

UNTIL the question of the manner of recruiting the new armies for the United States has been settled by Congress the problem of maintaining the personnel of electric railway service is probably the most vital one that faces this industry. In Europe the large number of withdrawals from service on the part of electric railway employees, either to enter the active military forces or to become munitions workers, has created unprecedented conditions, and although the percentage of the national population in the services of the British and French governments is now greater than it is likely to be in this country, the experiences of these two nations serve as a guide to possible future conditions in the United States.

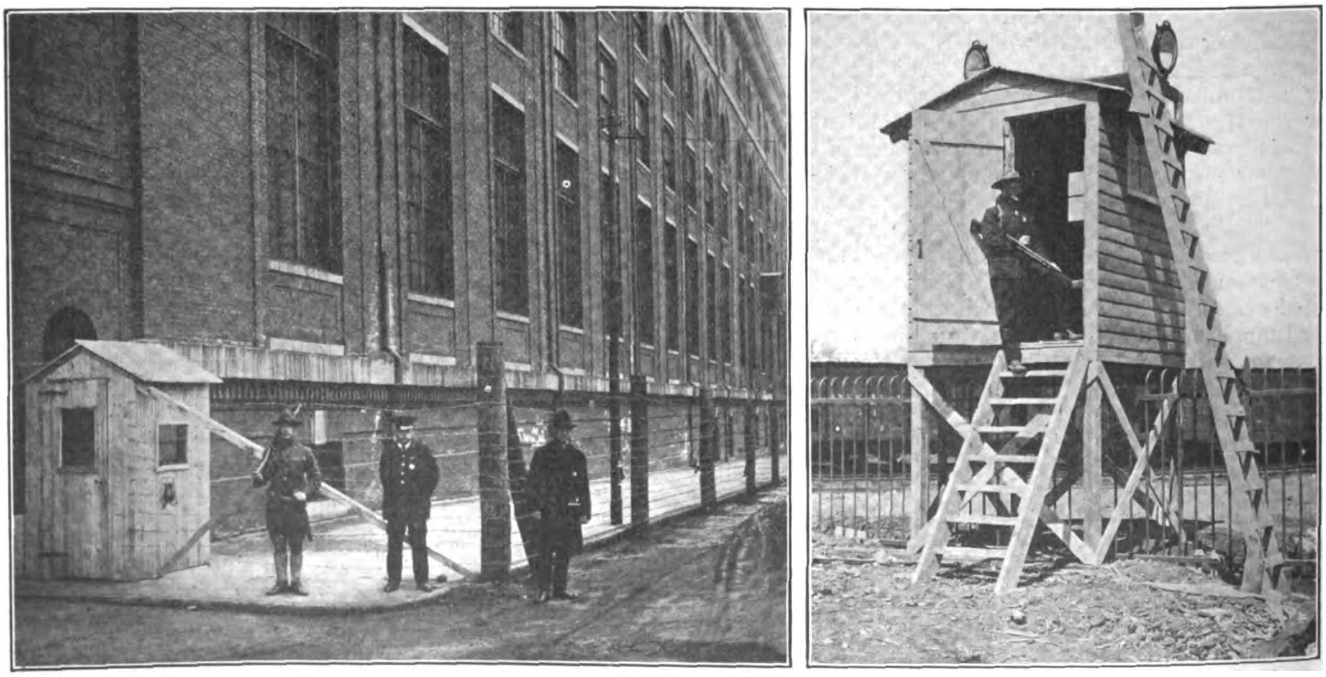
WOMEN EMPLOYEES IN GREAT BRITAIN

While readers of this paper are familiar with the general use of women conductors abroad, some additional information may be of interest. The last issue of the *Tramway & Railway World* is authority for the statement that women have also been employed as motormen on more than a dozen tramways during the past eighteen months. Among these is the Glasgow Corporation Tramways where there are now some 250 women as drivers. The practice was begun in October, 1915, and has been gradually extended without serious accidents, and the general manager, Mr. Dalrymple, has urged every woman conductor to undergo training at driving with a view to meeting any contingency. In fact, almost the majority of the tramway staff now consists of women. In a recent address Mr. Dalrymple said he would not hesitate to have the whole service run by women.

Experience of other British companies, however, according to the same paper, does not entirely bear out this favorable verdict. The statement is made that women conductors do not seem to be so enamored of their employment as was the case during the first year of the war, and in most towns the tramways have been obliged to shorten the hours of the women's staff. The London General Omnibus Company reports that it has been obliged to engage about 150 new women conductors every week to fill vacancies caused by resignations from a staff of about 2500 women collectors. Women employees also entertain less regard for discipline and punctuality. In one important town at least, they played on the sympathy of the public by declaring the work was of too hard a nature.

TRAMWAY CONDITIONS IN FRANCE

Tramway conditions in France, acording to newspaper reports, seem to be very similar to those in England so far as the employment of women for motormen and conductors is concerned. Women are also employed as inspectors and in the subway as ticket agents and collectors, but men beyond the military age are used as starters. The traffic on the tram lines and subway in Paris is larger than before the war, one reason being that the auto buses, of which there were many in Paris, were requisitioned by the government early in the war



WAR-TIME CONDITIONS IN UNITED STATES—FENCED-OFF SECTION OF CITY SIDEWALK BESIDE A POWER STATION THAT IS EXPOSED TO ATTACK; SENTRY-BOX WITH SEARCHLIGHTS TO GUARD RAILWAY PROPERTY for military purposes. The Metropolitain, or chief Paris subway, which operates forty-eight miles of track, shows gross receipts of $110,000 more in 1915 than in 1914. The operating expenses, however, were much higher, especially for coal.

EARLY MORNING RUNS BY BUSINESS MEN

In Newcastle, England, some runs, especially the early morning runs, are being taken by men engaged in other lines of business or professions who, for various reasons, have not been called on to don the khaki. Many of them are beyond the military age, but able and willing to serve in this way as auxiliary motorman for a few hours daily. In a recent address on tramway conditions, the chairman of the Corporation Tramways Committee said that he suggested to the Council some time ago that many ministers in the city, who are exempt from military service, might take this work on. He added laconically that as yet, none had volunteered.

TRANSIT FACILITIES FOR MUNITION WORKERS FEATURED IN BRITISH REPORTS

Attention has been drawn, by the entry of the United States into the war, to the remarkably complete reports on non-technical features of munitions manufacture which were made in Great Britain during the first year of the war and which have been made available in this country through distribution to public libraries. A feature of several of these reports is the emphasis that is laid upon the need for readjustments of transportation facilities for munitions workers, who work long hours at a fast pace to produce a maximum output. The establishment of new industries required for military purposes in Great Britain has brought practically insoluble problems of housing workers near such plants, and local transit facilities have been overtaxed in providing for movement of employees between their homes and their work places. Cases are cited in England where workers have had to leave home at 4 a. m. and do not return until 10 p. m., thus giving insufficient sleeping time to maintain even reasonably good health. Consequently, the principal factories in each district have in many cases furnished data as to the number of employees, the various destinations for their daily trips to and from work and similar data to permit co-operative arrangements on the part of transportation companies for the extraordinary service. This duty of looking to transit facilities seems to have been generally placed under the departments of welfare supervision that the war has brought so generally to British factories.

AIDS RECRUITING IN UNITED STATES ARMY

The Shore Fast Line (Atlantic City & Shore Railroad), Atlantic City, N. J., is probably the first traction line in the country to contribute the use of one of its buildings to Uncle Sam's recruiting forces. The "S. P. 64," the first private yacht tendered to the federal government to be equipped and used as a "submarine chaser," arrived at the shore resort recently carrying officers who sought recruits to the Naval Coast Reserve. The Shore Fast Line promptly provided a berth for the craft alongside its wharf at Absecon Inlet and then turned over one of its summer buildings to the officers as a recruiting station. The company has also been carrying recruiting posters and Red Cross posters on its cars.

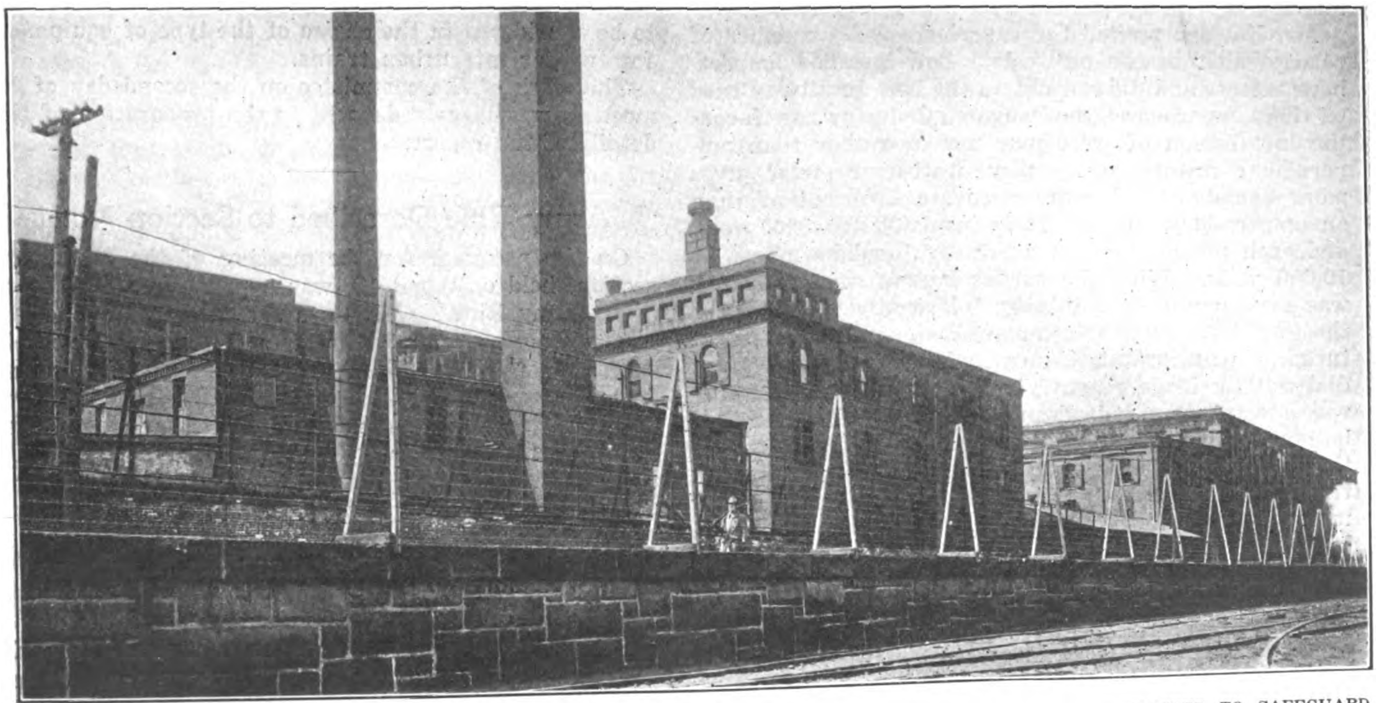
CENTRALIZED CONTROL FOR ENGINEER TROOPS

Engineers throughout the country are being asked to take up with their respective Congressmen and Senators at Washington the vital need for keeping all new engineer troops under the centralized control of the War Department rather than under many different state organizations. The plan of centralized control has the indorsement of the military engineering committee of New York, representing in its membership the National Engineering Societies of the United States.

PATRIOTISM ENCOURAGED BY ELECTRIC RAILWAYS

The Boston Elevated Railway conductors are wearing little red, white and blue bows on their coats. They were presented by President Brush with the request that they be worn in plain sight.

A number of electric railway companies have announced that they will carry without charge on their cars soldiers and marine men in uniform. The Brooklyn Rapid Transit Company, the Public Service Rail-



WAR-TIME CONDITIONS IN UNITED STATES—TEMPORARY BUT EFFECTIVE TYPE OF BARBED-WIRE FENCE ERECTED TO SAFEGUARD A POWER STATION way and the International Railway of Buffalo are among those which have issued such an order. In Buffalo the plan has been followed of issuing tickets good for transportation to the army headquarters to be distributed to the enlisted men and officers as they are needed.

WASTE GROUND TO BE CULTIVATED IN BROOKLYN

President Williams of the Brooklyn Rapid Transit Company has assigned definite parcels of land, belonging to the company and not now covered by tracks and buildings, to the different divisions of the company for cultivation. Any employee may apply for a plot to be cultivated by himself individually, or several employees can form a club to cultivate together a larger piece of ground. In making the announcement Colonel Williams said, in part:

"It is earnestly urged upon employees to take advantage of this opportunity, not solely on account of the benefit to themselves in reducing their own living expenses, but principally because to the extent that they thus feed themselves, more food is left in the market of the world for others who cannot help themselves. It is also urged that children of employees be encouraged to take an interest in the work and to assist their parents."

American Association News

At a Meeting of the Engineering-Transportation Committee in Chicago the Discussion Centered on Power-Saving Devices and Two-Car Interurban Trains—Recent Company Section Meetings Were Devoted Largely to Discussion of War Problems

Power-Saving Devices and Two-Car Interurban Trains Discussed at Chicago

Power-saving devices and two-car interurban trains were discussed by the Engineering-Transportation committee at its Chicago meeting on April 17 and 18. There were present G. H. Clifford, chairman, Fort Worth, Tex.; J. W. Allen, Boston Mass.; E. F. Gould, Cleveland, Ohio; R. F. Carbutt, Toledo, Ohio, members of the joint committee, and also by invitation, C. C. Chappelle, Railway Improvement Company; C. H. Koehler and C. H. Hurtt, Sangamo Electric Company, and H. L. Andrews, General Electric Company, Schenectady. The meeting lasted two days. On the first day Mr. Clifford outlined the topics to be treated in this year's report and stated that preliminary investigations were being made by subcommittees. He then called upon Mr. Koehler to describe the recent developments in connection with the manufacture and use of the Sangamo Economy car meter.

Mr. Koehler recited the experiences of a number of roads which in the early days had installed ampere-hour meters and did not obtain the best results. Based on these experiences, the Sangamo Company now favors the installation of watt-hour meters rather than ampere-hour meters. The new watt-hour meter gives more complete and more accurate information than an ampere-hour meter. It is insulated for 3000 volts and each meter is given a factory breakdown test at 10,000 volts. With the earlier meters some difficulty was experienced in obtaining full accuracy in reading the four dials, and the company designed and manufactured a printing attachment. Later the cyclometer dial with a large magnifying lens mounted before it was adopted as standard and is preferred by operators because of its ease of reading. Mr. Koehler described the essential features of his type of meter, pointed out that all of the parts are interchangeable and that the meter element can be removed from the case and a new one put in service in less than five minutes whenever checking is desired. The accuracy of the meter, he said, was guaranteed within a range of plus or minus 2 per cent. Mr. Koehler also described briefly the follow-up and record system recommended by his company for obtaining the best results in a power-saving campaign.

Mr. Chappelle had prepared for the committee an extended description of the Railway Improvement Company's coasting recorder, a part of which he read and discussed in detail. He also outlined in a thorough manner the basic principles involved in a solution of the problem of economic car operation. Then he made several observations on the possibilities for savings that exist on practically every road, and emphasized the fact that no power-saving device was fully effective without a thoroughly studied record system.

Mr. Andrews, at the request of the chairman, discussed the data obtained in a series of motor-car and trailer, and motor-car multiple-unit tests made at Fort Worth. The committee had been instructed to investigate trail-car operation in high-speed interurban service and to report upon the relative merits of trailers versus multiple-unit trains. Mr. Gould described the experience of the Aurora, Elgin & Chicago in the use of four-motor cars, two-motor cars and trail cars for making up its trains for high-speed main-line and branch-line service. He also set forth the most important factors to be considered in the choice of the type of equipment for two-car interurban trains.

The work of the committee on the second day of its meeting was largely devoted to the preparation of the details of the report.

Army Rifle Described to Section No. 1

On the program for the meeting of the Milwaukee section, held on April 12, was a paper by M. Gass on "Our Army Rifle." Mr. Gass sketched briefly the history of the modern rifle, mentioning the types used in foregoing wars, explaining their mechanisms, and pointing out their good and bad points. He also exhibited and explained the construction of the cartridges used with the several rifles.

Another feature of the meeting was the "Current Events" paper from the way and structures operating department, presented by Sid C. Cherrill. He described a number of jobs, showing lantern slides illustrating the equipment used and the methods of construction and reconstruction. He also told how the work of the different divisions of the department is organized. In addition to the formal proceedings there was a musical program and luncheon was served. The attendance was sixty.

CAST IN "THE GARDEN OF ROMANCE," WRITTEN AND PRODUCED BY EMPLOYEES OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY

"Find the Way—or Make One"

At a meeting of Public Service company section, held in Newark, N. J. on April 19, more than 300 men assembled to hear Martin Schreiber, chief engineer Public Service Railway, discuss the principles underlying success in railway and other lines of work. An abstract of the talk will be given in a later issue. The burden of this was that the opportunities ahead of ambitious men now are greater than those which earlier presented themselves to the men who at present occupy positions of leadership. The problems which must be solved are difficult but in every case there is a way out. The paper was discussed by representatives of a number of departments all of whom, like the principal speaker, quoted instances to show that success depends upon "finding the way out." W. R. Ricker, shop foreman Central Division, "brought down the house" by reading some original verses, proving by the experience of executives of Public Service that intelligent, hard work will in the end bring success.

Capital Traction Patriotic Rally

The March meeting of Section No. 8 developed into a patriotic rally during which the members pledged themselves to do their duty in the present emergency. Patriotic songs were sung and great enthusiasm was shown by the audience of more than 100 men.

The principal speaker was Col. Chauncy B. Baker, U. S. A., his subject being "The Function of Electric Railways in Transporting Troops During the War." Colonel Baker spoke first of the progress that had been made by steam railroads in transporting troops, comparing the results obtained during the Spanish-American war with the expeditious movement of the army units to the Mexican border last year. He stated that the general public was not familiar with the excellent work that had been accomplished, and attributed the results to the full and hearty co-operation of the railroads, through the American Railway Association, with the army officials.

Colonel Baker stated that the officials of Germany had given much consideration to whether it would be the better policy to build a system of railroads, giving direct communication from border to border, to insure the quick transportation of her armies, or to devote her resources to the construction of fortifications along her frontiers, and that she had finally done both. He pointed out that while up to the present her fortifications had been heard of very little, as the fighting had been done on foreign soil, her railroads had been of inestimable value.

The speaker said that during emergencies such as the one existing at present, in order to obtain proper results, the railroads of the country must be treated as a unit, and that this result had been accomplished during the recent Mexican trouble through the medium of the American Railway Association.

Bringing the subject nearer home, Colonel Baker explained that time is a very important element to consider in military operations at the present day; that the result of battles often hinges upon hours and minutes; that every means must be availed of in the transportation of troops to strategical points, and that here the electric railways are a very important link in the transportation chain.

J. H. Hanna, vice-president of the company, gave assurances that the company and every individual connected with it realized the importance of Colonel Baker's remarks and were ready to do their full duty. G. T. Dunlop, counsel for the company, voiced his opinion that so many men would want to go to the front and be in the thick of it, that the company might find it difficult to get enough men to operate its cars.

COMMUNICATION

Brooming of Poles

THE LINDSLEY BROTHERS COMPANY
CHICAGO, ILL., April 18, 1917.

To the Editors:

Our attention has been called to an item in your issue of March 17, page 505, relative to the brooming of poles, especially Western red cedar poles, at the ground line. We have investigated the source of this item and, after looking into the matter carefully, believe that the statement in your paper referred to above is not quite clear enough and works something of an injustice to the Western red cedar poles.

We find that the particular poles complained of were set in one of the government irrigation projects in the Western states, and that the "water surface at this location is at or very near the ground level throughout the entire irrigation season."

We may say that this is the first time that we have ever heard of any such complaint as this against the Western red cedar and, while undoubtedly the complaint is a true one in this particular case, we do not believe it can be used as a criterion. We note further that the poles in question have been set in the ground for some fifteen years and it is natural to expect that under the severe conditions mentioned there would be some effect on the poles after that length of time.

Furthermore, comparison has been made in this item of the Western red cedar with cottonwood and, according to your article, pine. We find that the correct name for this wood should be pinon. As neither this nor cottonwood is used to any extent for pole purposes we do not believe that this comparison is any reflection on the Western red cedar pole. R. L. BAYNE.

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Truck Equalization

The Author Discusses the Use of Equalizer Bars for Trucks in Various Classes of Electric Railway Service

BY S. A. BULLOCK

Manager Electric Truck Department The Baldwin Locomotive Works

It is desirable that all trucks be equalized.

Equalization is the provision of means for distributing equally the center-plate load on the wheels by applying parallel members, resiliently connected, so that they may form, in a vertical plane, an angle with each other, without producing undue stress upon either member.

Truck equalization may be of two kinds; first, side-frame equalization, which is the so-called truck equalization; and second, bolster equalization.

In side-frame equalization the top member is the frame, while the lower parallel member is the equalizer, this being commonly called, in consequence, the equalizer bar. Bolster equalization is exemplified by the construction in which there is supported from the transoms a spring plank or other means for carrying the springs which support the ends of the truck bolster, so that the truck bolster and transoms may form an angle with each other in a vertical plane without undue stress on either the transoms or bolster. Bolster equalization is invariably provided for all passenger trucks, without exception.

The combined equalization of side frame and truck bolster produces double equalization, that is, equalization in vertical planes parallel to and transverse with the rail. Thus the car body may be supported on center plates, which act as universal joints, permitting one or more wheels to move out of the normal horizontal plane without producing undue pressure at any one wheel, but equalizing the pressure on all.

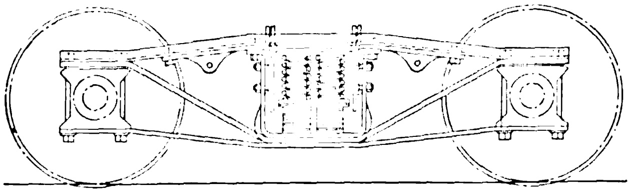


FIG. 1—PLAIN ARCH-BAR TRUCK WITHOUT SWING LINKS, USED FOR LOW-SPEED CITY SERVICE

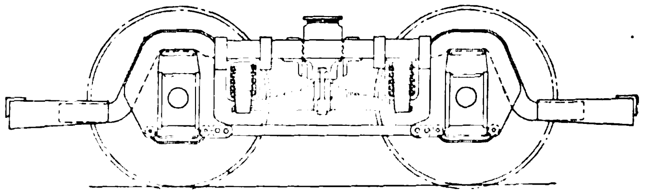


FIG. 2—DESIGN FOR CITY SERVICE PERMITTING FREE TRANSVERSE MOVEMENT OF BOLSTER

The first truck to be made consisted of a body mounted on an axle and a pair of wooden wheels. The motive power was man or ox. When the horse became the prime mover, the element of speed thus introduced brought four-wheeled vehicles, and a flexible board, or buckboard, was designed to absorb the irregularities of the uneven road. This was primitive equalization but it serves as an excellent example of a means for evenly distributing a load over four wheels.

During the past few years, for trucks in passenger city service, there has been a demand for minimum weight and minimum height, and conforming to this appeal from railway operators, the manufacturer has in some cases eliminated the equalized construction, and substituted a frame of rigid design, similar to the old "arch-bar."

Such an arch-bar truck may or may not include the spring plank with swing link supports that is common on freight-car trucks, but in either case the design provides only for bolster equalization, transverse with the track. If we accept noise, reduced flexibility, light loads, low speeds, and abnormal box play, under tolerable track conditions, this non-equalized type of truck, either motor or trailer, may be said to perform the functions of city service. As to the costs, we must offset the lower first cost by the greater distress to the track, truck and body, due to the rigid hammer blows of the truck on the track, this being the effect of non-equalized side-frame construction. In Fig. 1 is illustrated an arch-bar truck without swing links.

An equalizer may be of rigid or flexible construction. In case it is rigid, additional springs must be introduced; in case it is flexible it possesses the double function of equalization and resilience. In the first instance, we have the equalization of high-speed interurban trucks; in the second, the equalization of low-speed city trucks.

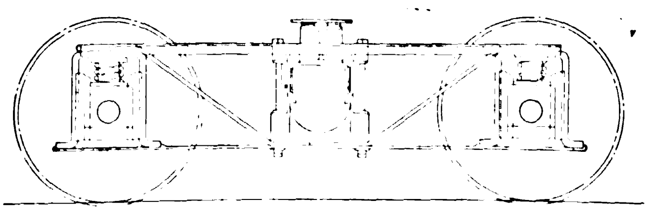


FIG. 3—HIGH-SPEED DESIGN HAVING SPRINGS OVER BOXES INSTEAD OF EQUALIZER BARS

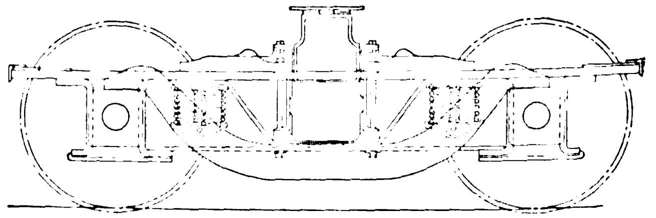


FIG. 4—TYPICAL EQUALIZER-BAR CONSTRUCTION FOR HIGH-SPEED INTERURBAN SERVICE

If it is essential to produce easier riding with its accompanying increase in weight, the so-called spring-equalized truck comes next in order. This truck is built with semi-elliptic plate springs parallel to the side frames, having spring and link suspension as shown in Fig. 2. This gives greater freedom of transverse movement for the bolster than the truck illustrated in Fig. 1. It should be noted that the longitudinal plate spring acts as a side-frame equalizer because its ends are resiliently connected to the side frame by links and springs.

Some truck designers are endeavoring to eliminate the need for equalizer bars, which are used in side-frame equalization, by introducing coil springs over the journal boxes. There are two objections to this design; first, it is not properly equalized; and second, it requires undue space over the journal box for its application. Fig. 3 displays such a design which, it may be said, is provided with a spring plank and long swing-links to give the bolster the relatively slow transverse movements of considerable amplitude, that are essential in high-speed service. This type of side-frame construction is light and possesses moderately easy riding qualities, but it does not give the flexibility which is produced by equalizing beams, nor does it adequately distribute the center-plate load over the four wheels.

Efficient equalization requires a spring base less than the wheelbase, and an equalizer which acts as a lever, transmitting any vertical force that is exerted on one wheel through the spring system to the upper parallel member, thus equalizing the load and gradually absorbing the shock. In the design shown in Fig. 4 these qualities are provided, this truck being equipped with a commonly used type of equalizer bar.

Summing up the matter, we should have in all cases the most effective equalization consistent with safety, comfort and weight. Therefore, interurban passenger trucks should be as perfectly equalized as is possible, city passenger trucks should be equalized to make good riding qualities, and it would even be well to improve the equalization of freight trucks.

Car Overhang on Curves

BY S. L. FOSTER

Chief Electrician United Railroads of San Francisco, Cal.

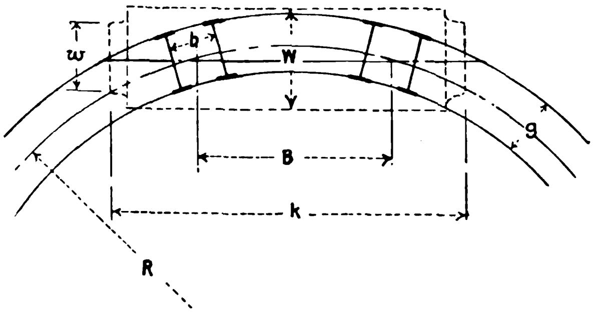
It is often desirable in order to avoid striking fences, poles, walls, etc., to know how far the corner or side of a certain type of car will overhang the gage line of the rail as it goes around a curve of a known radius when, on account of lack of car or curve, it is not possible to run the car around the curve for a practical test.

Mutilated obstructions, crushed car fronts and worse are occasionally seen, due to lack of foresight in this matter. A company once entered into a contract to lease a 25-ft. meandering double-track right-of-way without considering this feature, but when it was shown that the corners of the proposed, though unbuilt, cars would not pass the side poles on some of the as yet unbuilt curves, a 30-ft. right-of-way had to be secured.

The usual method is to construct a transparent tracing-cloth manikin of the essential measurements of the floor plan of the car to the same scale as that to which the drawing of the track curve is made. This manikin is superimposed on a drawing of the curve at the point where the amount of car overhang is to be determined and its extent marked and scaled off the drawing.

The same dimensions that are used in the following simple arithmetical expressions must be obtained for the construction of the manikin. By transforming these dimensions into improper fractions with a common denominator and then referring to tables of squares, the employment of these expressions is not any more laborious, and is more exact, than the tracing-cloth figure method.

The accuracy of the computations can readily be checked by another, the calculations can be made anywhere and without the necessity of taking the work to the drafting table, and this method obviates the necessity for a set of these manikins for each of the many different types of cars on a large system.



NOTATION USED IN COMPUTING CAR OVERHANG ON CURVES

The derivation of these expressions is simple, and as it is similar to that of the one for the location of the trolley wire on curves as published in the ELECTRIC RAILWAY JOURNAL of Jan. 2, 1914, page 63, it need not be given here.

The expression for the inside overhang of the middle of the side of car beyond the gage line of the inside rail of the curve is

$$\frac{W - g}{2} + R - \sqrt{R^2 - (b/2)^2 - (B/2)^2}$$

and for the outside overhang of the further projecting corner of the front fender beyond the gage line of the outside rail of the curve is

$$\sqrt{\left(w/2 + \sqrt{R^2 - (b/2)^2 - (B/2)^2}\right)^2 + (k/2)^2} - (R + g/2)$$

in which

R = radius of center line of track curve,

b = wheelbase of one truck.

B = distance from center of one truck to center of other truck,

w = greatest width of car body at front of car or, if fender projects in front of car, width of fender,

W = greatest width of car body at center,

k = length of car along its side or, if its fenders project in front of car, length over both fenders when down,

g = gage of track—distance between rails of one track.

All these measurements are in feet.

Example: An actual case where a pole had to be set before a loop track was in place.

R	Radius of curve	42 ft. 7½ in.	2046/48 ft.
b	Wheelbase of truck	4 ft. 6 in.	216/48 ft.
B	Center to center of trucks	20 ft. 10½ in.	1002/48 ft.
w	Width of fender	5 ft. 11 in.	284/48 ft.
k	Length of car plus both fenders	54 ft. 4 in.	2608/48 ft.
g	Gage of track	4 ft. 8½ in.	226/48 ft.

Answer. Outside overhang—6.92 ft. or 6 ft. 11 in.

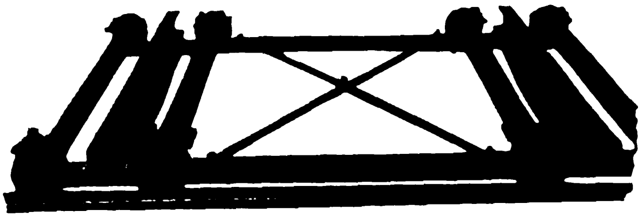
Subsequent measurements taken on three successive cars gave an average overhang of 6 ft. 10 in., which was as close agreement as could be expected.

Transfer Table Facilitates Truck Changing

Small Shop Requires a Design of Transfer Table Which Does Not Detract from the Available Floor Space

BY HENRY MEYER
Master Mechanic Beaver Valley Traction Company,
New Brighton, Pa.

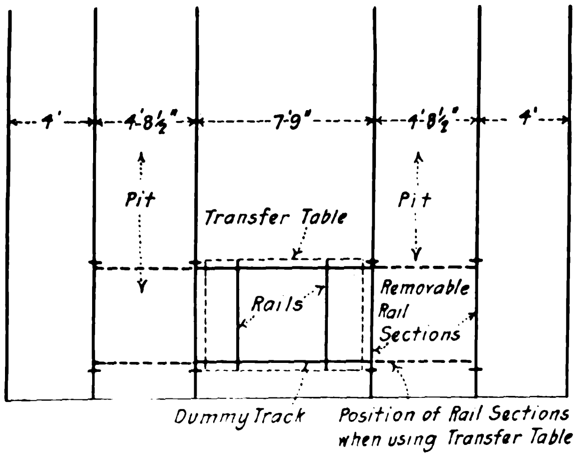
Our shop in which trucks are removed and repaired is narrow and the amount of floor space is small for the work which is handled there. For this reason when we decided to build a transfer table to speed up the exchanging of trucks, especially those of low-floor cars, it was desirable to use some scheme by which the table would not detract from the available floor space.



TRANSFER TABLE WITH TOP FLOORING REMOVED

The accompanying sketch shows how this was accomplished. The shop has two pit tracks. These are connected at one end by a dummy track, the rails of which are at such a height that the floor of the transfer table which runs thereon is just flush with the floor. The illustration of the transfer table shows it with its top or floor removed, in order that its construction can be seen. As it is the same length as the dummy track, it serves the purpose of a floor, and the floor space is not reduced when the table is not being used. The rails of the pit are cut so that the sections that are opposite the dummy track are removable.

To change a defective truck the pit rails are lifted out and placed across the pit at the proper level, so that they form an extension of the dummy track. The transfer table is then pushed into position so that its rails form an extension of the pit track.



METHOD OF USING TRANSFER TABLE IN EXCHANGING TRUCKS

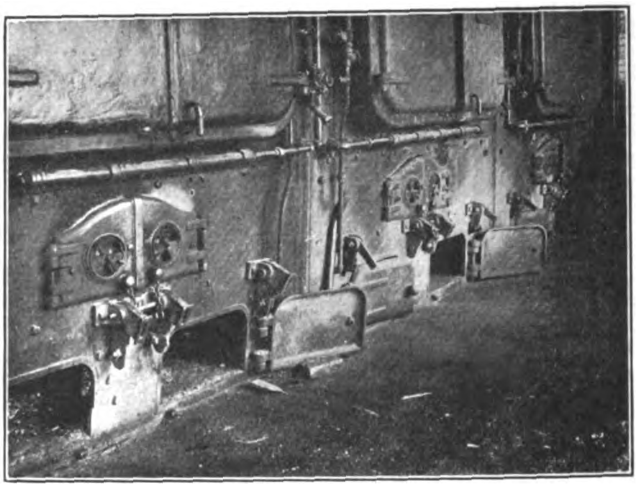
The car with the defective truck is run up until the truck is on the table. The car is then jacked up, leaving the defective truck on the table and the latter can then be pushed over to the other pit, where the defective truck is replaced by a good one. By simply pushing the transfer table back, the good truck is placed under the car and the operation is complete. In this manner a truck can be changed in about thirty minutes, thus effecting a considerable saving in time and labor.

As shown in the illustration the transfer table is made of four car axles mounted in a rectangular truck frame, which in turn supports two sections of 4-in. T-rails set at the standard gage of the pit track. These T-rails are trussed underneath with ½-in. x 5-in. flat iron. The material which had to be purchased for this truck cost about $50, and all the labor thereon was performed in our own shops.

A Simple Smoke Consumer for Boilers

An effective smoke consumer of original design has been used for some time at the Cold Spring shops of the International Railway, Buffalo, N. Y. The device employs jets of compressed air controlled by valves at the front of the furnace. The jets catch the smoke formed in the front of the furnace, blowing it against the bridge wall and back into the fire, where it is burned.

The nozzles are formed by four ½-in. pipes flattened on the end. They project through the front of the furnace just below the boiler tubes and are T-connected to the 2-in. pipe which may be seen in the illustration just above the fire door. The air is drawn from a large storage reservoir into which it is pumped by means of a motor-compressor, an automatic governor keeping the pressure between 50 and 60 lb. per square inch.



VIEW SHOWING SMOKE CONSUMERS INSTALLED ON BOILERS

Keep the Section Gang on the Track

At the recent meeting of the American Railway Engineering Association, discussion on the report of the signs, fences and crossings committee brought out opposition to the generally prevailing idea that the section gang may be used for all manner of work along the right-of-way. One railway man said that the section gang was the most expensive labor on the railway property when it was used off the track. He said that on many properties the gangs were expected to paint the signs, repair buildings, mow lawns at stations, repair telegraph lines, do signal maintenance work, etc. The place for the section gang is on the track, and if it is required to do all this other kind of work, it cannot be expected to do, and does not do, efficient track maintenance work. So strong was the sentiment supporting this idea that a motion to strike out from the proceedings a sentence in the committee's progress report which stated that the painting of crossing signs could be cheaply handled by the section gangs, prevailed.

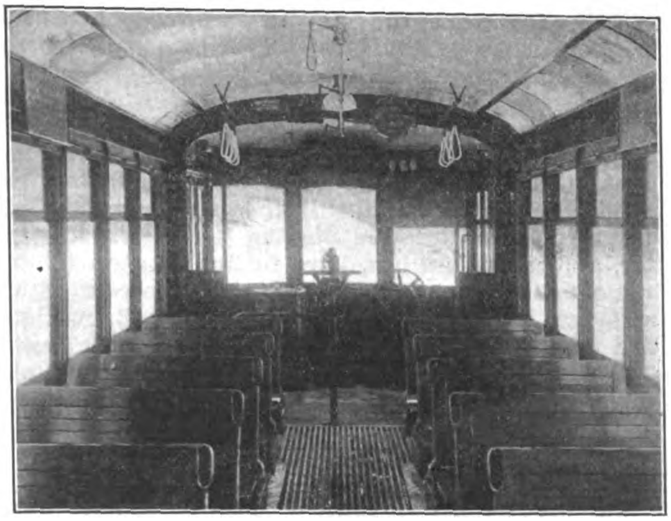
Single-Truck Cars for Binghamton

These Equipments Are 30 Ft. 6 In. Long and Have 9-Ft. 6-In. Wheelbase, 24-In. Wheels and Flush Platforms

The Binghamton (N. Y.) Railway has recently placed in service sixteen all-steel single-truck cars that possess the unusual features of a 9-ft. 6-in. wheelbase and flush platforms. The weight complete is 19,000 lb., and the over-all length is 30 ft. 6 in., giving a seating capacity of twenty-eight. Two-man operation is provided for, but the right-hand front doors are wide enough to permit the establishment of separate entrance and exit passageways, so that one-man operation can be adopted in the future if it appears to be desirable. The platform floors are flush with the main floor of the car, this being made possible by the use of 24-in. wheels which, it may be said, also make possible the unusually long, rigid wheelbase that has been adopted for the single truck. This truck design was adopted after an extended service trial on all of the Binghamton lines under the direction of C. S. Banghart, vice-president Binghamton Railway Company. The general dimensions of the new car are as follows:

Length over all	30 ft. 6 in.	First step to platform	11¼ in.
Length over dash	29 ft. 6 in.	Width of seats	35 in.
Length over body	18 ft. 6 in.	Width of aisle	25 in.
Length of platform over dash	5 ft. 6 in.	Post centers	29 in.
Height to trolley boards	10 ft. 3 in.	Door opening	50 in.
Extreme width	8 ft. 3 in.	Wheel base	9 ft. 6 in.
Rail to first step	15 in.	Diameter of wheels	24 in.
		Seating capacity	28

An all-steel continuous tee-bar construction of the type practically standardized by the Cincinnati Car Company—the builders of the equipment—has been used for the car body. This includes a plain arch roof of steel combined with steel letterboards whose beam strength is sufficient to support the platform by hanging them from the extensions of the roof beyond the corner posts. In consequence, nothing equivalent to the customary platform knees has been required, and there have been provided only longitudinal members sufficient to support the platform flooring and to withstand the buffing stresses of collisions. This materially increases the space available for equipment below the platforms. In fact, with ordinary constructions it would have been impossible to have installed the track scrapers and other apparatus required by the purchaser.

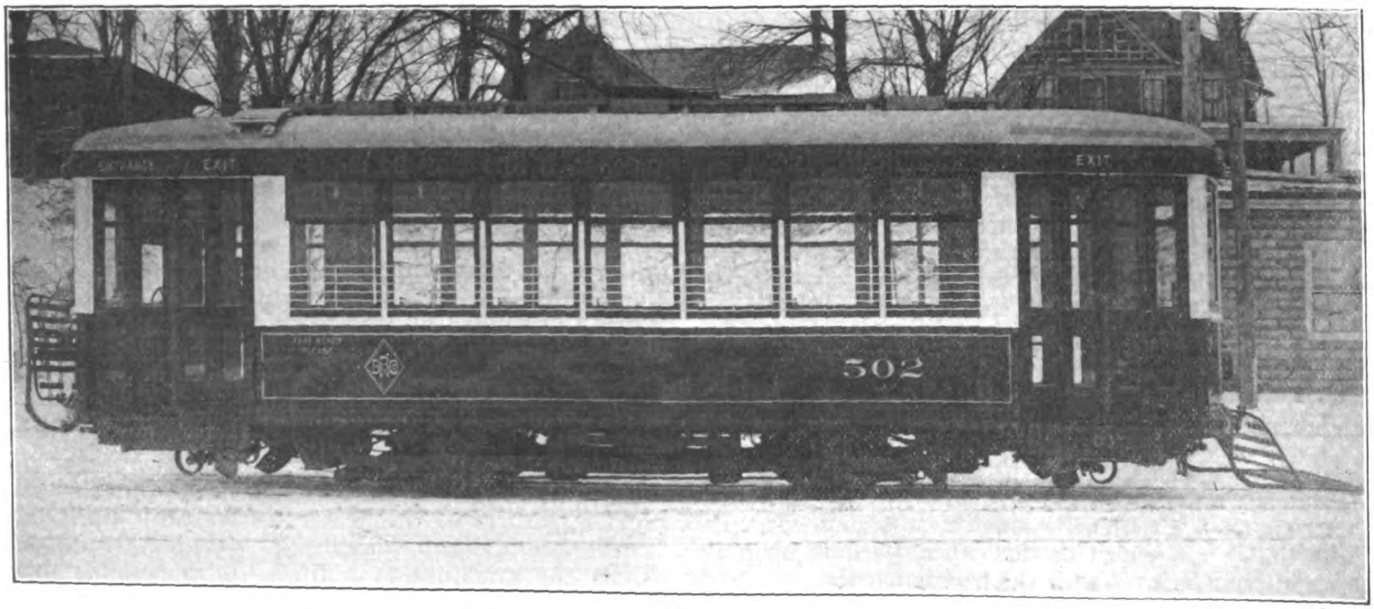


INTERIOR VIEW OF NEW CAR FOR BINGHAMTON

Insulation for the No. 18 gage steel roof is provided in the form of an outside layer of compressed cork 1 in. thick covered with No. 8 canvas. Inside, the carlines are exposed except for the advertising-card moldings, and the whole ceiling surface is painted with Pratt & Lambert's Vitrolite high-gloss white enamel, producing a brilliant finish. For the floor a base of yellow pine is installed with the customary surface of maple, and Mason safety treads at the edges of steps. For the wainscoting below the windows there is a 1-in. lining of compressed cork which is covered with 1/16-in. linoleum. Sash, doors and moldings are of ash painted with Valentine's green. Interior trimmings are of polished bronze.

For the lighting system there are three Dayton combination ventilating registers and lighting fixtures along the center line of the ceiling, the registers connecting with Railway Utility Honeycomb ventilators. Alba shades are fitted on the lighting fixtures and the lighting circuit is controlled through a Nicholls-Lintern selector switch. At all side windows double Pantasote curtains with Curtain Supply Company's ring-type fixtures are installed, together with the usual vertical flap curtain to shield the motorman from the light within the car.

Slat-type seats have been provided, these being of the Heywood Brothers & Wakefield Company's reversible type. They are made of birch with mahogany finish and have a length of 35 in., the backs being 17 in. high.



EXTERIOR VIEW OF BINGHAMTON SINGLE-TRUCK CAR

Other features of the equipment are vestibule window cleaners made by the Clear-Vision Cleaner Company, National Brake Company's MacWhirter-type staffless hand brakes, Cincinnati buzzer system with Consolidated buzzers at each side post, Westinghouse air sanders, Johns-Manville sand hose, Ohio Brass air traps, Rico hand straps, Crouse-Hinds flush headlights, Consolidated electric heaters with thermostat control, Ohio Brass tail-light system, a Sterling-Meeker single register, a Johnson fare box, Berg folding fenders, Hunter route and destination signs, Root air-operated track scrapers, Earll trolley catchers and T & B bushings and jam nuts for connecting conduit to junction boxes.

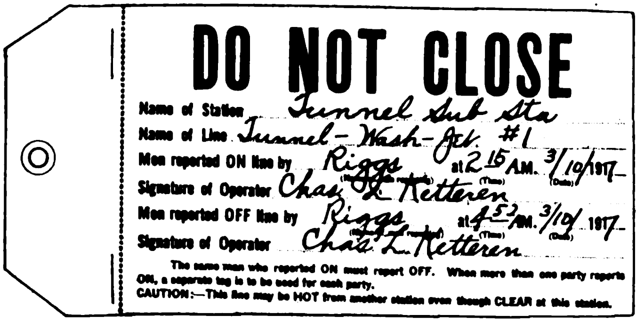
A sheet-steel transfer box of the Binghamton Railway Company's standard design is provided for each car, and the railway's design is also used for the flush-type motorman's climbing steps that are installed at diagonal corners of the car.

The propulsion equipment consists of two Westinghouse 506-A motors with double-end K-10-H controllers. The trucks are Brill 21-E. For the air-brake equipment National Brake Company's DH-5 compressors and PV motorman's valves are used, together with National Tube Company's piping and Keewanee unions.

High-Tension Line Repair Work Made Safer

Tag with Carbon Copy Feature Used in Carrying Out Ten Safety Rules of Pittsburgh (Pa.) Railways

Ten safety rules governing work on high-tension lines have been put into effect on the Pittsburgh Railways. The rules require the use of the tags shown in the accompanying illustration. Tags are placed on the handles of high-tension oil switches which have been opened to allow repair work to be done. The tag is so designed that a duplicate record is made of each tag used. Each tag has a slip of paper fastened to it which is the same size as the tag. This paper is coated with carbon on the back and is printed on the front the same as the tag. When the operator fills out the blanks the tag itself becomes the carbon copy, and the operator tears off the paper slip and keeps it as his own record for reference in case of any future controversy.



DO NOT CLOSE

Name of Station Tunnel Sub Sta

Name of Line Tunnel-Wash-Jct. #1

Men reported ON line by Riggs at 2 15 AM. 3/10/1917 (Time) (Date)

Signature of Operator Chas L. Ketteren

Men reported OFF line by Riggs at 4 52 AM. 3/10/1917 (Time) (Date)

Signature of Operator Chas L. Ketteren

The same man who reported ON must report OFF. When more than one party reports ON, a separate tag is to be used for each party.

CAUTION:—This line may be HOT from another station even though CLEAR at this station.

SWITCH TAG WITH CARBON-COPY FEATURE

On the back of the tag are the following instructions: "Attach firmly to the switch handle so that the tag will be conspicuous and the switch cannot be closed without noticing it. Return this tag to the load dispatcher when report is complete."

The ten safety rules are as follows:,

1. All high-tension circuits are to be considered "hot" under all circumstances except when specifically cleared in accordance with these rules.

2. The load dispatcher cannot clear a line. The responsibility for self-protection when working on high tension rests entirely with the men doing the work and the station operators. Under no circumstances shall men work on high tension until it has been reported clear and all phases have been short-circuited and grounded at each point where work is being done.

3. Each foreman, lineman, substation operator or repairman when advised by the load dispatcher that a line may be cut out and before doing any work on the high tension, must report to every station on the line and get the word of each operator that the line is clear at his station. When work is completed each man who has reported on must report off as quickly as possible to each station on the line.

4. No man, even though knowing that a line has been cleared for others, shall work on this line without reporting on and off as in Rule 3. Remember, a line may be hot from one station even though it has been cleared at other stations.

5. Each station operator in order to clear a line must open both the oil switches and the hook switches on that line. When a man reports on a line it must be cleared and a danger sign and a tag showing name of line, time, person reporting on line, and operator's signature placed on the switch handle.

6. When a man reports off of a line, the tag bearing his name must be removed. When all men have reported off, the danger sign must be removed and the line or equipment may be used as directed by the load dispatcher.

7. In emergencies to save life or property operators may open circuits without instructions from the load dispatcher. When the load dispatcher cannot be reached and in order to maintain service, circuits may be put into commission at the discretion of the operator provided these rules have been complied with.

8. To avoid misunderstanding, all telephone orders relating to working on high tension should be repeated back by the person receiving same.

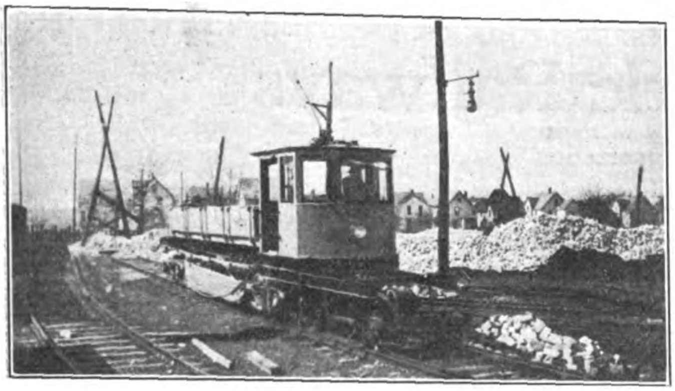
9. Except in emergency the load dispatcher must have twenty-four hours' notice previous to the time any high-tension line is to be taken off.

10. The words "line" and "high tension," as used in these rules refer to all high-tension lines and equipment inside as well as outside a station.

It will be noted in Rule 3 that each man who is about to work on a line must report the fact to each station on the line, and the operator at each station must place a tag on the controlling oil switch for each man so reporting. As each man reports that he is off the line, his tag is removed, and as the switch is not to be closed until all tags are removed, this will no doubt avoid accidents which occur where misunderstandings are not so well guarded against.

With the installation of these rules and the use of the tags a station operator has been given the power to close the switch on a line when all the men who have reported on have reported off again, whether these men have reported off to the other stations on the line or not. In other words, with permission from the load dispatcher, a line may be made hot from any station to which all men have reported off the line. This was done so that in case telephone lines are down and all the stations cannot be reached readily, service may be restored without the delay which would be necessary if all stations had to be advised that the men were off the line. When a line is off, all station operators treat it as if it were hot, unless they themselves have reported on the line to all stations to which it connects.

The Des Moines City Railway is utilizing an asbestos-lined tin cabinet fitted with a glass door and measuring about 16 in. on a side for the purpose of baking the small armatures of the heater motors after repairing. The box is equipped with five 32-watt lamps and will handle one armature at a time. It is possible thoroughly to bake an armature in twenty-four hours by this means.



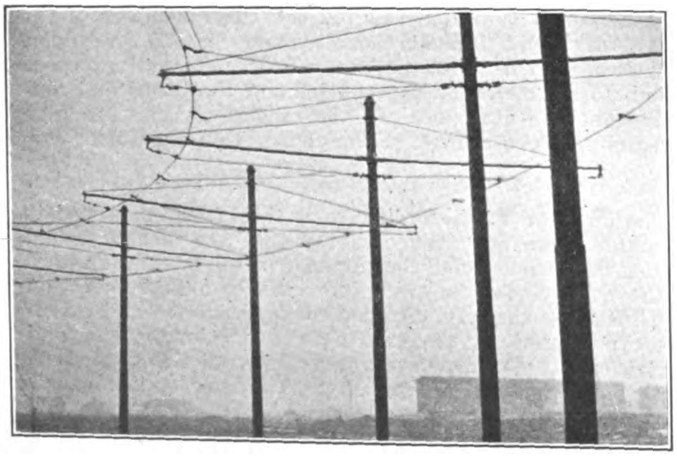
WORK CAR EQUIPPED TO CLEAN RAILS IN WINTER WEATHER

Machine for Clearing Rail Groove of Ice and Snow

A machine has been constructed and used successfully by Charles H. Clark, engineer maintenance of way Cleveland Railway, for cleaning snow and ice from girder groove rail during particularly bad weather conditions in the winter. It consists of an 18-in. steel wheel with seven 1-in. teeth around its circumference. The wheel is suspended from the framework on the front of a work car and is driven at 1800 r.p.m. by a motor which is also mounted on the framework. Any ice or snow accumulation can be thoroughly cleaned from the rail with the car running at any speed up to 8 or 12 m.p.h.

A Center-Pole Double-Trolley Overhead Loop

An unusual piece of overhead construction has been installed over the loop at the D. & C. boat dock in Cleveland by James Scott, superintendent of overhead, Cleveland Railway. Owing to the possibility that poles supporting the customary span loop construction might frequently have to be moved for city construction and other building work, it was decided to use center poles, and thus keep the entire railway construction within the limits of the track way. In the loop are seventeen National Tube Company 8-in., 7-in., 6-in. extra heavy steel poles, which are set in concrete 8 ft. in the ground. The 2-in. bracket pipes are set in sockets fastened to the pole by set-screws. The bracket extends entirely through the socket and rests against the pole, but can be adjusted and held with the set-screw if desired. The arms are 12 ft. long on either side of the pole. The method of supporting the trolley wire is clearly shown in the photograph reproduced below, the pull-over cables being fastened to the trolley about every 6 ft., thus making a smooth curve.



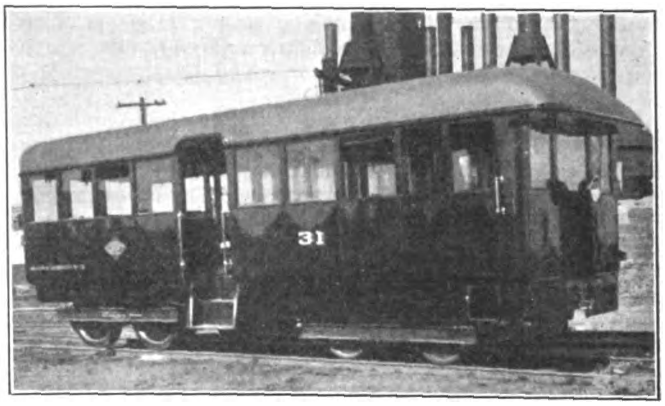
METHOD OF SUPPORTING TWO WIRES WITH CENTER POLES

One of the advantages of this construction was the practicability of putting up the entire overhead and of making all adjustments from the top of the company line car. It was thus possible to construct the entire loop in two days with a gang of four men. This construction holds the trolley wire in better shape than is possible with the outside-pole construction, and produces a rigid trolley wire instead of the long, sloppy span which would have resulted with poles set across the street from the line as would have been necessary in this case. The more rigid construction probably saves something on trolley-wheel wear as well.

As Mr. Scott said, the construction looks very expensive, but the saving in the construction cost and in reduced maintenance offset the extra material cost.

Car with Oil-Engine Drive for San Diego

The San Diego & Southeastern Railway has recently placed in service a light-weight motor car designed and built by the Hewitt-Ludlow Auto Company of San Francisco, Cal., for use on the 18-mile run between the cities of San Diego and Santee, Cal. The car weighs 20,400 lb., is 25-ft. long and seats thirty-two passengers. Its equipment includes a 70-hp. oil engine that drives both pairs of rear truck wheels by means of worm gears. Gearing for four speeds is provided, including reverse, the maximum speed being 40 m.p.h. The car has two four-wheeled swiveling trucks, the wheels at the front being 24 in. in diameter while those on the rear truck are 36 in. in diameter. Westinghouse air-brake equipment is used. Since Feb. 23 the car has been in service on a regular schedule, and it has met with the unqualified approval of the officials of the railway as well as the company's patrons who have ridden in it.



NEW 10-TON MOTOR CAR FOR SAN DIEGO

The car takes the long grades which obtain upon the interurban route that it serves, and which range from three-fourths of 1 per cent to 2½ per cent, at 25 m.p.h. on the third gear connection and it holds the rails very well, the operators finding it unnecessary to slacken speed through any of the curves on the main line. In the business district of San Diego the car goes around curves of 55-ft. radius and over all kinds of special track work with perfect ease.

B. M. Warner, general superintendent San Diego & Southeastern Railway, states that while the car has not yet been in operation long enough to arrive at operating costs, except that of fuel, it has fulfilled all requirements to the company's satisfaction. With regard to the cost of fuel, he states that straight distillate is used, costing 9.5 cents per gallon. About 5.5 miles are run by the car for each gallon of fuel. The new car makes even less noise than the electric cars running on the city lines of the same districts.

News of Electric Railways

Traffic and Transportation

Financial and Corporate **Personal Mention** **Construction News**

Rhode Island Investigation Provided

Special Commission Will Report in 1918 on Possible Changes in Fare and Modification of Taxes for the Rhode Island Company

An investigation of the affairs of the Rhode Island Company, Providence, R. I., to be followed by relief from taxes and other financial burdens if such relief is found fair and just, has been provided by the General Assembly of Rhode Island. The act creating a special commission to conduct the investigation was passed on April 17 in the House and on April 18 in the Senate. Governor Beeckman, it is expected, will approve the measure.

WHAT THE SPECIAL COMMISSION WILL CONSIDER

The bill authorizing the investigation creates a special commission composed of the chairman of the Board of Tax Commissioners, the chairman of the Public Utilities Commission and the Bank Commissioner. They are directed to investigate the finances, management, property and mode of operation of the company for the purpose of determining whether the company is furnishing proper transportation and whether the net income is a fair and equitable return upon the property owned and controlled by the company and devoted to the public service.

Upon the completion of the investigation the commission is authorized to determine and certify to the Public Utilities Commission what modification of rates of fare or changes in the transfer system seem to it to be just and equitable. The Public Utilities Commission in turn is authorized and directed to order the company to make the changes in accordance with the recommendations of the special commission. The right is reserved by the company, however, to appeal from such finding. Any modifications ordered to be put into effect are to be subject to change from time to time by the Public Utilities Commission. The special commission is authorized to investigate fully into taxes or payments made by the company to the State or to any city or town in the State with a view to determining whether it is just and equitable to require such payments or whether they should be modified or suspended.

COMMISSION TO REPORT IN 1918

The special commission is to report in print to the General Assembly by Feb. 15, 1918, a summary of the results of its investigation with its recommendations. The expenses of the investigation are to be shared equally by the company and the State. The sum of $20,000 was appropriated by the State toward the cost of the work. The special commission is empowered to retain such experts as it may deem necessary to the proper conduct of the investigation.

Springfield Purchases Power

C. V. Wood, president of the Springfield (Mass.) Street Railway, has confirmed the report that the company has entered into a contract with the Turners Falls Power & Electric Company under the terms of which the latter will provide the entire power supply of the former. Philip Cabot, president of the Turners Falls company, stated that within the next two or three years about $3,000,000 will be expended in the extension of the generating and transmission facilities of the Turners Falls system, a considerable part of this outlay being required for the erection of a large steam plant in the Connecticut Valley which will operate in conjunction with the existing hydroelectric station at Montague City and other plants affiliated with the system. The Margaret Street engine-driven railway plant in Springfield will be shut down and a modern substation system provided, with motor-generator sets and suitable transformer and switching equipment. Mr. Wood said that it is hoped to complete the entire installation with respect to the Springfield system by the end of 1918 and that it is planned to inaugurate a part of the service during the present year.

Cincinnati Transit Ordinance Passed

City Votes 30,028 to 14,186 in Favor of the Rapid Transit Loop Lease

The rapid transit loop lease ordinance was ratified by the voters of Cincinnati, Ohio, on April 17 by a vote of 30,028 to 14,186, with one precinct not counted. Approximately 40 per cent of the total vote was cast on the ordinance. The opposition to the measure came from the residence districts of Clifton Heights, Madisonville, Hyde Park and Oakley. The ordinance had been approved by the Cincinnati Traction Company.

Chief Engineer Krug of the Rapid Transit Commission stated that everything is in readiness to begin the detail plans for the loop. The commission will meet soon to employ engineers, draftmen and others with technical ability. Mr. Krug thinks that the commission will be ready to award contracts by Jan. 1, 1918. The contracts will be let in sections, but the engineering work will be completed and all contracts will be based on the system as a whole.

PRESIDENT SCHOEPF PLEASED

W. Kesley Schoepf, president of the Cincinnati Traction Company, which will operate the loop under the grant, said:

"I am gratified that the people have approved the ordinance proposed by the city and accepted by this company. It is my intention and that of the other officials of this company to carry out the spirit of the contract in every way and to make it possible for the people to realize their highest hopes in connection with the building and operation of the rapid transit line, both for interurban and for local service.

"I am not afraid of the working of that part of the ordinance, referring to the machinery for control of service and extensions by the city. With proper co-operation between the city officials and the officials of this company there will be no trouble on this score, and I am determined, as far as I am concerned, to see it worked out this way."

E. W. Edwards, chairman of the Board of Rapid Transit Commissioners, said:

"I am convinced that all can now with good grace get together in carrying out this project. The members of the Board of Rapid Transit Commissioners invite the advice and co-operation of all, and they feel confident that those who before the election opposed some of the terms and conditions of the ordinance will be among the first to give support and lend counsel in completing this big work."

WHAT THE ORDINANCE MEANS

The approval of the ordinance is the last step needed to accomplish surface franchise revision and permit rapid transit development and the entrance of the interurban lines to the city. Under the grant there will be unified operation of all lines in the city, city control over service and extensions, protection of the existing railway investment, and a division of the surplus earnings between the Cincinnati Traction Company and the city. The new rapid transit lines proposed will cost $6,000,000. An extended review of the terms of the grant was published in the ELECTRIC RAILWAY JOURNAL for April 7, page 633.

President Addresses Employees

Head of Bay State Street Railway, in Personal Message to His Co-workers, Recites How Costs Have Been Jumping Upward

The first issue of *Bay State Triangle Talks*, published weekly to acquaint the employees of the Bay State Street Railway, Boston, Mass., with the business of the organization of which they are a part, was devoted entirely to a personal message from President P. F. Sullivan to his co-workers. Mr. Sullivan called particular attention to the upward tendency of street railway operating costs and asked the men to lend their best efforts toward increasing the company's income and decreasing its expenses. He said there were three ways in which the company could get money. First, it could increase its income by increasing its business; second, it could save money by using care, by being economical and by saving not only dollars but cents; and, third, by persuading people to invest in the company. To drive home the fact that people could not be persuaded to invest money in an enterprise which did not promise to pay a fair return on the investment and insure the safety of the principal, he said that the Public Service Commission had authorized the company to sell $2,500,000 of 6 per cent notes, but that there was no market for them at present. The big job of all connected with the company was to make the property so attractive to investors that they would lend the use of their money without persuasion. He promised to tell the men in detail in other letters later on how they could help to better the company's credit.

HOW COSTS HAVE JUMPED

The properties that now compose the Bay State Street Railway were consolidated in 1899. Some of them were then making money, but their owners saw that the ever-increasing cost of improvements was eating into the profits at an alarming rate. The organizers of the company felt sure that by combining the small companies great savings could be effected. These savings were made as planned. Then came changes in the art of electric railroading that no one could foresee. The public demanded double-truck cars, more speed, more comfort, everything that cost money, and in replacing the old rails the money invested in them only a few years before was lost. Since 1899 more than $5,000,000 had been spent for new cars and equipment, more than $4,000,000 on power stations, and $13,500,000 to build or rebuild 562 miles of track and overhead. Maintenance costs had increased from $785 a track-mile in 1901 to $1,683 in 1914. In 1915 the company paid in wages $4,419,768 and in 1916 it paid $4,911,223, an increase of 11 per cent. It would cost the company nearly $300,000 more for coal in 1917 than it did in 1916. Steel axles, of which the company used 100,000 lb. a year, now cost $5.68 per hundredweight as compared with $3.98 formerly. Window glass, of which the company used 1600 boxes, had jumped from $3.66 per box to $6.10. Trolley wheels that were formerly 65 cents each were now 82 cents. The company used 85 miles of trolley wire every year, or 180,000 lb. Whereas this material formerly cost 13 cents a pound it now costs 31½ cents. The operating revenue of the company in 1916 was $9,996,484. The operating expenses were $7,764,880. The increased revenue over 1915 was only $458,077, whereas the increased operating expenses amounted to $867,128, or almost twice as much as the increased revenue. Despite all this fares had not changed except recently in districts where the result to the company was almost negligible.

Mr. Sullivan said there were 33,000 privately-owned automobiles in the territory in which the company operated. He estimated the annual loss of revenue to the company on account of their competition at $1,200,000. In addition the loss to the company through the operation of jitneys totalled $290,000 annually. The company now paid out $438,000 a year for accidents. One of the jobs of all the men connected with the company was to cut down the number of preventable accidents. Mr. Sullivan promised to tell in detail later how this could be done.

Mr. Sullivan also gave some helpful advice to the motormen and conductors in regard to selling transportation.

No M. M. and M. C. B. Exhibit

To Conserve Country's Resources Exhibit Is Abandoned This Year—Definite Plans About Exhibit to Be Announced Later

In view of the declaration of war and the proclamation of the President urging citizens to take all steps possible to conserve the resources of the country, there will be no exhibit of railway supplies this year at the time of the annual convention of the American Railway Master Mechanics' and Master Car Builders' Associations which were scheduled to meet at Atlantic City June 13 to 20. Whether the associations themselves will meet this year, or, if they do, whether they will meet at Atlantic City, has not yet been decided. It is expected that early announcement will be made on this point.

The circular letter of Edmund H. Walker, president of the Railway Supply Manufacturers' Association, to the members of the association, making this announcement was in full as follows:

"The annual exhibition that was to have been held by our association in Atlantic City, N. J., June 13-20, this year, in connection with the conventions of the Master Mechanics' and Master Car Builders' Associations, has been postponed for one year.

"The unanimity of opinion among our members that we should, as patriotic citizens, conserve our time and resources, holding them subject to the call of our country's necessities, impels this action.

"The probability is, from the best information I have been able to obtain, that the two railroad associations with which we are allied will not hold their conventions this year, and if held, it will be in such limited time, with limited attendance, and at such place (not necessarily Atlantic City) as the exigencies warrant.

"Anticipating the possibility and the probability of the necessity for this decision your president some time ago stopped all work on exhibition preparation, and while, necessarily, some money has been spent, we are not financially obligated as in normal years, when at this date the major portion of our expense is incurred.

"Further notice will be given relative to refund for exhibit space when the expenses incurred in connection therewith have been totalled and your committee takes the necessary action."

N. E. L. A. May Not Convene

Necessity of Mobilization of Industries Makes Change in Character of Meeting Probable—Suggested Conference on War

As this paper goes to press news is received that the proposed annual convention of the National Electric Light Association, scheduled for May 28 to June 1 at Atlantic City, may also be postponed. A feeling that a convention of the usual character should not be held under the stress of war conditions is now uppermost in the minds of those who are guiding association affairs, and it appears probable that, owing to matters of national importance requiring the earliest possible consideration, the meeting will be advanced to an earlier date and curtailed materially in scope.

The reason for this position is that the officials and employees of member companies who would attend the convention in normal times cannot be spared from their regular duties under present conditions. Their services are felt to be needed within the organizations at home.

There is also, however, a strong feeling that an opportunity should be furnished for the executives to confer on questions of public policy created by the war, and it is thought that great advantage would result from a free discussion by officials in executive session. For this reason it is suggested that such a conference may be arranged for a date early in May.

The plan to hold a great patriotic meeting on the evening of May 30, Decoration Day, will of course be held in abeyance until a final decision is reached on the question of the main convention. A patriotic gathering, however, may be arranged.

Philadelphia Program Held Up

Public Service Commission Refuses to Act Until Legislative Program Is Decided

The Public Service Commission of Pennsylvania on April 14 not only again withheld authority for the construction of the proposed rapid-transit lines in Philadelphia, but also announced a program under which it virtually places the matter before the Legislature for solution. Under its ruling the commission will give the transit question no further consideration whatever until the transit bills now before the Legislature are disposed of. Announcement of the decision was made by the secretary of the commission after a conference between its members and Mayor Smith, Transit Director Twining and Joseph P. Gaffney, chairman of the finance committee of Councils of Philadelphia. The announcement was as follows:

"All further consideration of the subject of the applications will be suspended by the commission until after action has been taken by the Legislature on the proposed measures in reference to the transit situation in Philadelphia suggested by the Mayor."

Progress on Legislative Bills

Up to the time of this announcement by the commission all of the transit bills in question, with the exception of the Gans measure, had made little progress beyond their mere introduction and reference to committees. The four bills before the Assembly, all of which were drafted by Mr. Gaffney at the request of Mayor Smith and Director of City Transit Twining, give the city full control over the transit situation.

On April 17, however, the Hecht bills were reported out of committee to the House and the Salus bill reported to the Senate. The Hecht bills propose an amendment to the Constitution whereby the city could deduct from its estimated borrowing capacity indebtedness incurred for the construction or purchase of public utilities earning revenue, and provide that the city may take over through the exercise of the right of eminent domain the existing transit lines operated in Philadelphia. The measure providing for an amendment to the Constitution could have no effect until it was passed by the next Legislature and after a vote by the citizens.

Mr. Taylor Approves P. R. T. Proposal

Former Director of Transit in Philadelphia Disagrees with Conclusions of Present Director

A. Merritt Taylor, former director of transit of the city of Philadelphia, Pa., has issued an extended statement in which he disagrees with the conclusions of Director Twining, as expressed in his report which was published in abstract in this paper for April 7. Mr. Taylor says: "This proposed agreement, which the Philadelphia Rapid Transit Company is now prepared to consummate, secures to Philadelphians vast profits, adequate service and splendid facilities, upon terms which are just to all parties in interest." Mr. Taylor also thinks that the agreement is far better, from the city's standpoint, than the tentative agreement which was entered into between the department and the company in 1914.

Mr. Taylor bases these conclusions upon his belief that Estimate "B," in the Ford, Bacon & Davis report, giving the probable average yearly increase in gross earnings during the first part of the agreement, is most conservative. He also suggests that the deficit to the city under the plan could be further reduced by the temporary postponement of the construction of the Chestnut Street Subway and in other ways permitted under the contract. With these changes, the deficit to the city from 1919 to 1933, inclusive, with a 5-cent fare and free transfers, would aggregate only $17,728,250, instead of $47,342,000, as shown in Estimate "B," while the benefits to the city from increased real estate values will more than offset this loss. Hence, no increase in the tax rate will be necessary. In conclusion, Mr. Taylor urges the adoption of the Philadelphia Rapid Transit Company's proposal.

Armistice in Albany

Suspended Employees Will Be Reinstated Pending Settlement of Matter of Extra Runs

The recent controversy between the United Traction Company, Albany, N. Y., and its trainmen, arising from the refusal of extra men to operate extra cars, was temporarily adjusted at a recent meeting between representatives of both sides. The conference lasted two hours, and the result of it was that the seventy-two suspended employees will be reinstated, no part of the present agreement will be changed, and the matter of handling extra cars will be taken up at a conference between officers of the Amalgamated Association and officials of the company. If an agreement cannot be reached in conference some other way will be found to solve the question, but it will probably not be by arbitration, as the company refused to consider this question again unless there was something specific to be arbitrated.

C. F. Hewitt, general manager of the company, said the company wanted assurance that the extra cars would be operated, and if this assurance was received things might be smoothed out. He pointed out the expense entailed in commanding regular men to operate extra cars, and said there should be some arrangement whereby the extra men would do this work. Then the conference became deadlocked, the company holding that regular men should not be indiscriminately excused from regular duty when there were extra cars to be operated, and the men asserting that any regular man who wished to be excused should be permitted to get off, and his regular run taken by an extra man.

Finally the company made an offer to hold a conference for the purpose of reaching an equitable agreement as to the use of extra men, providing that during the negotiations extra men operate extra cars.

Tacoma Extension Decided

Extension to Line Owned by City Will Be Operated by Private Company

Definite plans for the construction by the city of Tacoma, Wash., of an extension of the present municipal tideflats car line from its present terminus to the plant of the Todd Shipbuilding & Construction Company were formulated at a meeting of the City Council recently. The city will build the line and furnish the rolling stock, and the Tacoma Railway & Power Company will operate it under an agreement similar to the one now in force covering the operation of the present line. The plan calls for an expenditure of at least $160,000, which will be covered by utility bonds. In this total will be included the original $35,000 of bonds the proceeds of which were used to construct the present city line. The question of raising fares will be taken up by the Council and officials of the company at an early meeting, it being generally conceded that an increase of at least 2 cents will be necessary if the line is to pay.

Amendments made to the original plan of construction call for the extension of the line 1600 ft. additional to Willapa Street. Upon the guarantee of C. W. Wiley, superintendent of the shipbuilding plant that 1500 men would be employed by Oct. 1, Commissioner Gronen's estimate of three motor cars and three trail cars was doubled.

A special committee has advised the Council to consider the extension of the proposed line an additional 1½ miles from the proposed terminus at the shipbuilding plant, at an estimated cost of $90,000, to serve 400 employees of the Buffelin & Ernest Dolge Lumber Company.

It has been decided that the transfer arrangements between the city's line and the lines of the Tacoma Railway & Power Company will remain on the present basis until the contract which is now in force expires on Sept. 14, 1921. At present the city receives 1 cent on all transfer business, while the Tacoma Railway & Power Company receives 4 cents. The traction company has agreed to sell the city direct current at 0.75 cent a kilowatt-hour until the city can generate its own direct current. Commissioner Gronen has telegraphed an order for 12,000 ft. of trolley wire to an Eastern firm for the tideflats extension. This is the first contract to be placed for material for the extension.

Bonus for Richmond Employees

Virginia Railway & Power Company Announces Bonuses for 2000 Men on Account of Abnormal Living Costs

On account of the abnormal increase in the cost of living, due to the war, and to help its employees meet expenses incident thereto, the directors of the Virginia Railway & Power Company, Richmond, have decided to pay all their employees working on an hourly basis a bonus of 2 cents for each full hour worked. Employees on the monthly payroll, drawing salaries of $100 a month or less, will receive a bonus of 10 per cent of their monthly salary. The payment of the bonuses will be continued until conditions are such, in the judgment of the directors of the company, as to warrant their discontinuance. The bonuses apply to the wages of men all over the company's system, embracing the street railway and light and power utilities of Richmond, Norfolk, Portsmouth and Petersburg, and the gas utilities of Norfolk and Suffolk. About 2000 men are affected.

In a statement which he made, T. S. Wheelwright, president of the company, said:

"The bonus is entirely voluntary on the company's part. It was ordered by the directors as an emergency measure to help our men to meet the extraordinary living conditions that the war has created. The paying of this bonus will mean an increase of more than $100,000 in our payroll for the year. A year ago, on Jan. 1, 1916, the company declared a voluntary wage increase amounting to about 10 per cent, and representing an increase of $100,000 or more over the payroll charge then in force. As far as we are informed our company is paying in wages to its employees a higher rate in proportion to fares charged than any other street railway in the country."

Co-operative Employees' Magazine

A monthly magazine designed for distribution to the employees of any electric railway is being published by the Public Utility Publicity Bureau, 30 North LaSalle Street, Chicago, Ill., under the editorship of W. F. Brashears. This magazine of thirty-two pages, 6¾ in. x 9¾ in., is now being supplied to about sixty electric railways. The body of these magazines is uniform, but covers carrying the names of the local roads are added to the copies circulated by each property. The publication carries no advertising. The object of the magazine is to furnish the companies in moderate-sized cities a company publication which will cover the desired field at a low cost. Arrangements can be made to insert local matter and thus give each road practically an individual magazine without great expense. The character of the contents is so chosen as to create a more friendly and loyal feeling between the men and the management, to foster the safety-first movement and to gain the assistance of the men in the efforts of the company in securing a more adequate revenue and the elimination of burdensome taxes and restrictions.

Detroit Commission at Work

The municipal railway commission of Detroit, Mich., in conjunction with the Common Council committee on public utilities has again tackled the subway proposition. At a joint meeting held early during the week commencing April 8 it was decided to expend $15,000 for the purpose of bringing up to date the traffic survey made for the city three years ago by Barclay Parsons & Clapp. This report, containing comprehensive data on Detroit's needs, will be the basis of any recommendations the railway commission may make to the Common Council regarding the subway plan. The commission and the utilities committee will also investigate claims made by the Monorail Company of America, which has made two propositions to the city. One is for the city to build the monorail system and pay the company 1 per cent of gross receipts. The other is that the city make a contract with the company which would compensate investors in the enterprise. The company has installed a working model of the elevated in the Council Chamber.

Toledo Considers Supervision

That Part of the New Grant Relating to This Matter Considered on April 9

At the conference on April 9 between the Toledo Street Railway Commission and Henry L. Doherty, chairman of the board of the Toledo Railways & Light Company, Toledo, Ohio, the proposed supervision over the operation of the property by the city was discussed. It was agreed that a street railway commissioner should be appointed by the City Council, and that he should have an auditor at work in the company's office continually. He will be expected to make monthly reports of all transactions to the Council. The clause relating to this point provides that the company shall pay the expense of the commissioner's office. This the Street Railway Commission estimates at $25,000 a year. Mr. Doherty contended the commissioner should be paid from the city tax funds.

Mr. Doherty agreed with reluctance to the provision which gives the City Council the right to approve or reject all contracts involving more than $1,000 made by the company. He reiterated his declaration that he could not agree to the confiscation of the plant in case the Council should disapprove of anything in its management or operation, and he was firm in his refusal to approve of the provision that the stock of the proposed community company should be sold at less than par. He also objected to the provision that the city may designate a new purchaser.

At a subsequent conference between Mr. Doherty and members of the commission it was agreed that, in the event the city decides at any time to take over the railway, the company will accept a cash payment equal to 25 per cent of the agreed valuation, less the amount in the equalization fund which the city may retain as a working capital.

A number of minor points still remain unsettled, but members of the commission stated that they consider the negotiations have now been practically completed.

At a meeting of the City Council on the evening of April 16 a communication from Mayor Milroy was read in which he urged favorable action on a resolution which would open the way to the amendment of the city charter in such a way that negotiable bonds may be issued for the purchase of the street railway property. Mayor Milroy also urged the Council and the people to study carefully the community plan of settlement which has been worked out by the Mayor's Street Railway Commission and Henry L. Doherty. The commission has announced that, following the discussion of this plan, the matter of fixing the valuation of the property will be considered. The Mayor says that the Council should see that the city receives power to determine the value of the railway.

Settling San Francisco Problems

On April 6 headings met in the Twin Peaks Tunnel, San Francisco, Cal., and the successful completion of the bore became practically assured. The concreting is expected to be finished and the tunnel ready for track work by the end of June. With the completion of the tunnel in sight, careful consideration is being given to the possible extension of the Municipal Railway through the tunnel and into the territory on the far side of the ridge.

Three plans for providing transportation in the district beyond the tunnel have been proposed. One is that the city operate cars of the San Francisco Municipal Railway over the existing lines on a mileage basis; another would provide for the leasing of these lines from the United Railroads for a fifteen-year term, and the third is that the United Railroads be allowed to handle traffic through the tunnel on the city's tracks on a mileage basis.

Since the proposal of these several schemes, the broader proposition of purchasing the entire United Railroads' system has been seriously considered by the public utilities committee of the Board of Supervisors, and the committee has arranged for a meeting of city and company officials at which the possible plan of such purchase may be discussed.

Merchants on Market Street are opposing the plan to put four tracks on that thoroughfare and the United Railroads is also opposed to a duplication of the system.

Decision in Tacoma Case About May 1.—The State Public Service Commission at Olympia, Wash., has postponed for two weeks its decision in connection with the plea of Stone & Webster interests for relief from the provisions of the Tacoma city franchise relating to the payment of an earning tax and other requirements.

Strike in Lincoln.—Less than half the employees of the Lincoln (Neb.) Traction Company went on strike at midnight on April 18. The men have been negotiating with the company for several weeks for full recognition of the union. This was the principal demand of the representatives of the union, although a small wage increase was also included in the request to the company. The officials of the company have refused to recognize the union and have discharged the leaders of the movement.

Illinois Line Increases Wages.—The Kankakee & Urbana Traction Company, Urbana, Ill., has adopted a new scale of wages for trainmen as follows: For the first six months, 25 cents an hour; for the second six months, 26 cents; for the second year, 28 cents; for each succeeding year, 30 cents. Heretofore a flat wage of 28 cents an hour has been paid, irrespective of the length of time men have been employed. The flat scale was adopted when the road was opened in December, 1912. The new scale becomes effective on June 1.

Seattle Conference Postponed.—The conference over the matters at issue between the city of Seattle, Wash., and the Puget Sound Traction, Light & Power Company, scheduled to begin on April 12, was postponed for a week. Among the questions to be taken up is that of whether the company's tracks on Third Avenue shall be opened to the municipal car line in exchange for privileges to be granted to the company by the city. The company desires the city to fix a rental for the use of the bridges across the Lake Washington Canal at Fremont Avenue and Fifteenth Avenue Northwest. It also desires to operate one-man cars.

I. T. S. Not Subject to St. Louis Mill Tax.—The city counselor of St. Louis, Mo., has advised the public utilities committee of the Board of Aldermen of St. Louis, Mo., that it would be illegal to collect the mill tax on the interstate traffic of the Illinois Traction System into St. Louis. The traffic in the city on the system would be subject to the mill tax, but this is so small that it has been suggested it would not be worth while to attempt to collect it. The committee recently asked the city counselor for an opinion as to whether the Aldermen could order proceedings started to collect the mill tax from the company, following the company's action in obtaining from the Interstate Commerce Commission an advance of 5 cents in its passenger rate to Granite City.

Seattle Settlement Approved.—H. C. Gill, Mayor of Seattle, Wash., has signed the eleven ordinances passed by the City Council by which all differences between the city of Seattle and the Seattle & Rainier Valley Railway were settled. Concessions relating to the paving of right-of-way are granted to the company, which receives authority to reconstruct its lines on the Dearborn Street regrade, and also obtains franchises for the extension of its line on Genesee Street. There is to be an exchange of transfers between city lines and the Rainier Valley lines, under the terms of two of the ordinances. The city receives common-user rights on Fourth Avenue for the cars of its present municipally owned and operated street railway.

Program of Association Meeting

Missouri Association of Public Utilities

The entertainment committee of the Missouri Association of Public Utilities has again arranged for the annual convention on board the steamer Quincy. The dates of the convention will be May 17, 18 and 19. The boat will leave St. Louis on May 17 at 9.30 a. m. and will reach Cape Girardeau about 7 p. m. Here dinner and entertainment will be tendered by the local commercial club. The boat will remain at Cape Girardeau until noon on May 18 and will return to St. Louis about noon on May 19. On previous boat trips the association has gone outside of the State of Missouri. The round-trip fare, including meals and berth, will be $16 for adults and $8 for children under twelve years of age. The details of the program of papers have not yet been fully arranged.

Financial and Corporate

Annual Report

Chicago Surface Lines—Chicago City Railway

The gross earnings, expenses and distributed residue receipts of the Chicago (Ill.) Surface Line (the unified organization operating the Chicago Railways and the South Side Lines) for the twelve months ended Jan. 31, 1916 and 1917, are shown in the following statement:

	1917		1916	
	Amount	Per Cent	Amount	Per Cent
Earnings:				
Passenger cars	$34,204,581	98.35	$31,061,878	98.02
Chartered cars	4,671	0.01	4,175	0.01
Funeral cars	3,510	0.01	4,805	0.01
Mail carriers	24,837	0.07	24,837	0.08
Mail cars	......	...	60,673	0.19
Newspaper cars	8,361	0.02	8,291	0.03
Freight earnings	1,772	...	801	...
Garbage car service	10,497	0.03	27,499	0.09
Advertising	221,425	0.63	221,338	0.70
Rents of buildings, etc.	83,456	0.24	80,754	0.25
Sale of power	83,803	0.24	82,292	0.26
Interest on deposits	129,063	0.37	105,175	0.33
Miscellaneous	13,654	0.04	8,243	0.03
Gross earnings	$34,789,636	100.00	$31,690,761	100.00
Expenses:				
Maintenance	$2,695,561	7.75	$2,650,658	8.35
Renewals	2,783,170	8.00	2,535,260	8.02
Operation of power plants	2,728,261	7.85	2,779,718	8.75
Operation of cars	10,079,620	28.95	9,376,311	29.60
General expenses, including Board of Supervising Engineers	2,047,451	5.90	1,966,780	6.21
Taxes	1,409,456	4.05	1,732,629	5.47
Total expense of operation	$21,743,522	62.50	$21,041,356	66.40
Residue receipts	$13,046,114	37.50	$10,649,405	33.60
Divided:				
Chicago Railways, 60 per cent	$7,827,668	22.50	$6,283,149	19.84
South Side Lines, 40 per cent	5,218,445	15.00	4,366,256	13.76

The foregoing statement is taken from the latest annual report of the Chicago City Railway, which with the Southern Street Railway and the Calumet & South Chicago Railway, forms the South Side Lines. During the year ended Jan. 31, 1917, the gross earnings of the unified surface system increased $3,098,875 or 9.78 per cent, this being more than double the normal yearly rate of increase. The gain stands out strongly against the results of the two preceding years, which showed an aggregate decrease in gross of a little more than $1,000,000. Practically all of the last year's gain came from passenger earnings, which rose $3,142,703 or 10.12 per cent.

The total expenses of operation for the last year increased $702,166 or 3.33 per cent, the operating ratio dropping from 66.4 per cent to 62.5 per cent. Maintenance expenses rose $44,903 or 1.69 per cent; renewals, $247,910 or 9.77 per cent; operation of cars, $703,309 or 7.50 per cent, and general expenses, $80,671 or 4.10 per cent, while the expenses for operation of power plants dropped off $51,457 or 1.85 per cent, and taxes $323,173 or 18.64 per cent. The net result of unified operation was an increase of $2,396,709 or 22.5 per cent in the residue receipts to be divided between the Chicago Railways and the South Side Lines.

In the year ended Jan. 31, 1916, the South Side Lines received 41 per cent of the residue receipts, but in the last fiscal year 40 per cent. In the last year the net income of the Chicago City Railway was $1,749,710 or 9.72 per cent on the capital stock at par, as compared with a net income of $1,413,540 the year before, or 7.85 per cent upon the capital stock. Four quarterly dividends aggregating 8 per cent, with an extra dividend of 1¼ per cent in December, 1916, were paid in the last year upon the $18,000,000 of capital stock of the company, this total of 9¼ per cent comparing with 8 per cent the year previous. The surplus on Jan. 31, 1917, was $187,903, while on Jan. 31, 1916, it was $136,122.

The income statement of the Chicago City Railway for the year ended Jan. 31, 1917, showing the disposition of its 40 per cent of the residue receipts, follows:

40 per cent of the residue receipts of Chicago Surface Lines		$5,218,445
Deduct joint account expenses, interest on capital investment of the Chicago City Railway and the Calumet & South Chicago Railway, and net earnings of the Southern Street Railway		3,616,023
Net earnings of Chicago City Railway		$1,602,422
City's proportion, 55 per cent		881,332
Company's proportion, 45 per cent		$721,090
Add interest on capital investment		2,558,167
Income from operation		$3,279,257
Other income, net		88,244
		$3,367,501
Interest on bonds outstanding		1,617,791
Net income		$1,749,710
Surplus at Jan. 31, 1916		136,122
Total		$1,885,832
Dividends, 9¼ per cent	$1,665,000	
Miscellaneous	32,929	
		1,697,929
Surplus at Jan. 31, 1917		$187,903

During the year the company built 11.31 miles and acquired through purchase from the Chicago & Western Railway 3.32 miles, making a total of 14.63 miles of single track built and acquired. It reconstructed 9.40 miles of single track. The total mileage is now 328.47.

Electric Railway Statistics

Comparison of Returns for January, 1917, with Those for 1916 Shows Unsatisfactory Conditions in Eastern District

A comparison of electric railway statistics for January, 1917, with figures for the corresponding month of 1916, made by the information bureau of the American Electric Railway Association, indicates an unsatisfactory state of affairs in the traction business of the Eastern district of the United States. This has had a depressing effect upon the returns for the country as a whole. Data for January, representing 8670 miles of line of companies scattered throughout the country, figured on the per mile of line basis, show an increase in operating revenues of 8.01 per cent, an increase in operating expenses of 14.35 per cent and a decrease in net earnings of 2.63 per cent. Data representing 6911 miles of line show an increase in the amount of taxes paid of 6.72 per cent, and a loss in operating income of 10.19 per cent.

The returns from the city and interurban electric railways, as shown in detail in the accompanying table, have been classified according to the following geographical grouping: Eastern District—east of the Mississippi River and north of the Ohio River. Southern District—south of the Ohio River and east of the Mississippi River. Western District—west of the Mississippi River.

Of the three groups shown, returns for the Eastern representing 6035 miles of line indicate an increase in operating revenues of 8.04 per cent, an increase in operating expenses of 16.58 per cent and a decrease in net earnings of 6.18 per cent. Returns representing approximately 80 per cent of this mileage show an increase in the amount of taxes paid of 7.82 per cent and a decrease in operating income of 17.84 per cent. Returns for the Southern group representing 965 miles of line, though showing a greater percentage increase in operating expenses than in taxes, still indicate a slight increase in net earnings. There has been a 4.85 per cent increase in the amount of taxes paid by companies in this group, with 0.87 per cent increase in the operating income.

Returns for the Western group are more encouraging. Data representing 1670 miles of line indicate an increase in operating revenues of 8.79 per cent, in operating expenses of 6.88 per cent and in net earnings 12.41 per cent. Though an improvement is thus shown over the corresponding month of 1916, it must not be forgotten that the year 1916 was a poor one for the Western railways.

As has been predicted, the operating rates of the electric railways in the United States is increasing. For January it shows an increase from 62.67 in 1916 to 66.35 in 1917. The increase is largely due to the growing operating ratio of the Eastern district. The Southern district also shows an increase, while the Western district, whose operating ratio has been high, shows a slight decrease.

New Reorganization Plan Proposed

An amended plan for the reorganization of the Northern Electric Railway, Chico, Cal., was made public on April 1 by the reorganization committee, of which Frank B. Anderson is chairman. The plan provides for the issue of $10,700,000 of securities of a new corporation in lieu of the existing securities of the component companies which form the Northern Electric system. All existing mortgages will be foreclosed and the properties bought in for the new company.

In the circular letter which was mailed with the amended plan to the security holders the statement was made that the form of reorganization agreement, as amended, had been approved by all groups of security holders and their committees except an interest of less than 1 per cent.

The new corporation to be organized as soon as the plan is approved by the California Railroad Commission will have fifteen directors, of whom twelve will be appointed

REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR JANUARY, 1917

Account	United States				Eastern District				Southern District				Western District			
	Amount, January, 1917	Per Mile of Line			Amount, January, 1917	Per Mile of Line			Amount, January, 1917	Per Mile of Line			Amount, January, 1917	Per Mile of Line		
		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase
Operating revenues	$18,112,958	$2,089	$1,934	8.01	$13,786,549	$2,284	$2,114	8.04	$1,225,448	$1,270	$1,206	5.30	$3,100,961	$1,857	$1,707	8.79
Operating expenses	12,018,473	1,386	1,212	14.35	9,296,706	1,540	1,321	16.58	724,230	750	695	7.91	1,997,537	1,196	1,119	6.88
Net earnings	6,094,485	703	722	†2.63	4,489,843	744	793	†6.18	501,218	520	511	1.76	1,103,424	661	588	12.41
Operating ratio, per cent	1917, 66.35; 1916, 62.67				1917, 67.42; 1916, 62.50				1917, 59.05; 1916, 57.63				1917, 64.40; 1916, 65.55			
Miles of line represented	1917, 8,670; 1916, 8,591				1917, 6,035; 1916, 5,981				1917, 965; 1916, 961				1917, 1,670; 1916, 1,649			
Companies Reporting Taxes																
Operating revenues	$13,446,314	$1,946	$1,831	6.28	$9,796,703	$2,024	$1,916	5.63	$665,892	$1,300	$1,238	5.00	$2,983,719	$1,913	$1,763	8.50
Operating expenses	9,280,330	1,343	1,182	13.62	6,988,858	1,444	1,246	15.89	375,353	733	680	7.79	1,916,119	1,228	1,152	6.59
Net earnings	4,165,984	603	649	†7.09	2,807,845	580	670	†13.44	290,539	567	558	1.61	1,067,600	685	611	12.11
Taxes	880,024	127	119	6.72	600,566	124	115	7.82	55,161	108	103	4.85	224,297	144	138	4.34
Operating income	3,285,960	476	530	†10.19	2,207,279	456	555	†17.84	235,378	459	455	0.87	843,303	541	473	14.37
Operating ratio, per cent	1917, 69.01; 1916, 64.56				1917, 71.34; 1916, 65.03				1917, 56.38; 1916, 54.93				1917, 64.19; 1916, 65.34			
Miles of line represented	1917, 6,911; 1916, 6,836				1917, 4,839; 1916, 4,785				1917, 512; 1916, 511				1917, 1,560; 1916, 1,540			

†Decrease.

for the first year by the holders of the bonds and three by the holders of the stock.

The unsecured creditors are provided for under the plan by an arrangement that upon depositing their claims they shall be entitled to receive 30 per cent of the face value of their bills in common stock.

The amended reorganization plan has been perfected without any reference whatever to any proceeding which may or may not be taken against Leon and Louis Sloss, W. P. Hammon, E. J. de Sabla, Jr., and E. R. Lilienthal as indorsers of the notes of the Northern Electric Railway.

The new plan was outlined by the committee, which comprises Frank B. Anderson, John S. Drum, Vanderlynn Stow, I. W. Hellman, Jr., Fred W. Kiesel, John D. McKee, A. F. Jones, James K. Moffitt, M. H. Hyland, Miles Standish and A. L. Reed.

Tidewater Power Company Sold

William J. Norton of Norton, Bird & Whitman, engineers, Chicago, Ill., and Baltimore, Md., during the week ended April 14 concluded the transfer of the utility property of the Tidewater Power Company, Wilmington, N. C., from Hugh McRae, the president of the company, who owned a controlling interest in the stock, to Brooks & Company, Scranton, Pa.

The Tidewater Power Company controls the street railways of Wilmington, as well as an interurban line between Wilmington and Wrightsville Beach, on the Atlantic Ocean. The company also controls the electric and gas utilities and about 1500 acres of suburban real estate. It is understood that Mr. McRae will devote his entire attention from now on to the development of more than 70,000 acres of farm land which he owns in and around Wilmington, on a very comprehensive scheme of colonization and development.

Brooks & Company have been closely identified with the United Service Company, Scranton, Pa., which operates utilities in Ohio and Indiana, and also with the Keystone Utilities Company, which operates in Pennsylvania. L. H. Conklin, the general manager of these associated companies, assumed control of the Tidewater Power Company.

That Mr. McRae contemplated disposing of his interest in the company was noted in an article published in the Electric Railway Journal of Feb. 3, page 222.

Birmingham, Ensley & Bessemer Railroad, Birmingham, Ala.—The reorganization committee for the holders of the securities of the Birmingham, Ensley & Bessemer Railroad, of which C. H. Zehnder is chairman, has notified the holders of certificates of deposit issued under the agreement dated Sept. 15, 1914, that the reorganization of the company has been completed, that the properties sold at foreclosure have been conveyed to the new company which is known as the Birmingham-Tidewater Railway, and that bonds of that company are ready for distribution to the committee's depositors. The stock of the Birmingham-Tidewater Railway, as noted previously in the Electric Railway Journal, has been transferred to the Birmingham Railway, Light & Power Company in consideration of the guaranty by the latter company of the payment of the principal and interest of the bonds of the new company held by the committee. The committee now announces that upon surrender of the certificates of deposit, depositors will receive: (1) First mortgage 5 per cent thirty-year gold bonds of the Birmingham-Tidewater Railway, dated Jan. 1, 1916, with coupons maturing July 1, 1917, and all subsequently maturing coupons attached of a face amount equal to 50 per cent of the Birmingham, Ensley & Bessemer Railroad bonds represented by the certificates of deposit. (2) An amount in cash equal to the interest on said new bonds for the year 1916. Fractional amounts less than $500 will be adjusted by the issuance of scrip certificates.

Birmingham Railway, Light & Power Company, Birmingham, Ala.—The stockholders of the Birmingham Railway, Light & Power Company will vote on April 26 to authorize an issue of $2,000,000 of 6 per cent notes to mature in 1919, the proceeds to be used to pay for the Birmingham, Ensley & Bessemer Railroad, which was acquired in accordance with the terms set forth in the Electric Railway Journal for Feb. 3, 1917, page 225, and March 3, 1917, page 410.

Bristol (Tenn.) Traction Company.—Judge H. C. McDowell, in the Federal Court at Bristol, Tenn., has adjudged the Bristol Traction Company bankrupt. Plans for the reorganization of the company are under way.

Boston (Mass.) Elevated Railway.—The West End Street Railway, operated under lease by the Boston Elevated Railway, has petitioned the Massachusetts Public Service Commission for authority to issue $1,581,000 of bonds to refund a similar issue of bonds dated Aug. 2, 1915, and maturing Aug. 1, 1917. The new issue is to bear interest at not to exceed 6 per cent, and to run thirty years. Excess realized from the sale of these bonds will be applied to permanent improvements.

Carolina Power & Light Company, Raleigh, N. C.—According to the consolidated income statement of the Carolina Power & Light Company, and its affiliated companies, the Yadkin River Power Company and the Asheville Power & Light Company, the gross earnings for the calendar year 1916 at $1,474,948 represented a gain of $111,255, or 8.1 per cent over those of 1915. The gross earnings of the Carolina Power & Light Company increased 12 per cent, and the net earnings 7 per cent. The gross earnings of the Yadkin River Power Company increased 22 per cent, and the net earnings 34 per cent. The property of the Asheville Power & Light Company was considerably damaged by floods during the year, and operations were affected for a short time. In this case the increase in gross was only 3.7 per cent, and net showed a decrease. The first and last-named companies, which between them have 32.8 miles of street railway track in Raleigh and Asheville, served in 1916 a total of 7,377,789 passengers, an increase of 23,020 over the preceding year.

Eastern Texas Electric Company, Beaumont, Tex.—Stone & Webster, Boston, Mass., are offering $600,000 of Eastern Texas Electric Company first mortgage collateral trust 5 per cent bonds at a price sufficient to yield a return of more than 5½ per cent.

Elmira Water, Light & Railroad Company, Elmira, N. Y.—The Elmira Water, Light & Railroad Company has applied to the Public Service Commission of the Second District of New York for permission to issue $222,000 of 5 per cent fifty-year bonds under its first consolidated mortgage. These bonds are dated Sept. 1, 1906, and are due Sept. 1, 1956. The amount authorized is $5,000,000, and the amount at present outstanding is $3,667,000.

Gary & Interurban Railroad, Gary, Ind.—The Gary & Interurban Railroad has been authorized by the court to issue additional receiver's certificates to the face amount of $250,000. Under this authorization the company has already sold $114,000 of the certificates to the International Trust & Savings Bank, Gary, Ind.; the First National Bank, Hammond, Ind.; the Indiana Harbor National Bank, and the First Trust & Savings Bank, East Chicago, Ind. The certificates were issued under date of April 16, bear interest at 5½ per cent, and were authorized to be sold for not less than par. The proceeds of the issue are to be used to take up $51,000 of outstanding certificates issued by the receiver and to provide funds for improvements, including a new substation and new cars.

Gary & Hobart Traction Company, Hobart, Ind.—The Gary & Hobart Traction Company has been incorporated in Indiana, with a capital stock of $60,000, as the successor to the Gary, Hobart & Eastern Traction Company, the property of which was sold under foreclosure some time ago. The officers of the new company are Ora L. Wildermuth, president; Adlai T. Ewing, secretary, treasurer and general manager; Ora L. Wildermuth, Adlai T. Ewing, William Earle, Harold Stratton and Grant Crumpacker, directors of the company.

Georgia Railway & Electric Company, Atlanta, Ga.—The Georgia Railroad Commission has authorized the Georgia Railway & Electric Company to issue $54,000 of refunding and improvement forty-year 5 per cent sinking-fund bonds to reimburse the treasury of the company for expenditures made by the company for additions and improvements to its properties during 1916.

Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo.—The Supreme Court of Missouri has granted a continuance, to the October term, of the appeal of the Kansas City, Clay County & St. Joseph Railway against a judgment for $1,500,000 in favor of the Interstate Railway. The judgment was obtained in a Jackson County Court in 1915. Senator James A. Reed is one of the attorneys for the Interstate company, and the continuance was granted because of his absence in Washington. The Interstate Railway obtained a verdict of $1,500,000 damages for the taking of right-of-way on which it alleged it held options. Subsequently receivers were appointed for the Kansas City, Clay County & St. Joseph Railway, but they were discharged following the approval of a new bond secured by the company. The plaintiff, however, resisted the approval of the bond for a year.

Mount Vernon (Ohio) Electric Street Railway.—It is reported that the treasurer of Knox County, in which Mount Vernon is located, has petitioned the Common Pleas Court there to sell the property of the Mount Vernon Electric Street Railway and apply the proceeds on street improvement tax claims amounting in all to more than $7,000. The company is in the hands of a receiver and the road is not now being operated.

Municipal Service Corporation, Philadelphia, Pa.—The Municipal Service Corporation is said to be negotiating for the acquisition of the Youngstown & Suburban Railway, which operates 38 miles of electric railway out of Youngstown, Ohio. The Municipal Service Corporation now operates the Chester Valley Electric Company, Coatesville, Pa., the Salem (Ohio) Lighting Company, the Alexandria County (Va.) Lighting Company, the Staunton (Va.) Lighting Company, the Sumter (S. C.) Lighting Company, the Valdosta (Ga.) Lighting Company, and the Citizens' Traction Company, Oil City, Pa. The properties are operated by Day & Zimmerman, Philadelphia, Pa.

Republic Railway & Light Company, New York, N. Y.—At a meeting of the directors of the Republic Railway & Light Company, held on April 12, R. P. Stevens was elected vice-president and a member of the executive committee, succeeding George A. Galliver, resigned. This will not interfere with Mr. Stevens' duties as president of the Mahoning & Shenango Railway & Light Company. At the same meeting Robert Lindsay, vice-president and general manager of the Cleveland (Ohio) Electric Illuminating Company, was elected a director and a member of the executive committee of the Republic Railway & Light Company, succeeding Samuel McRoberts, resigned. The Republic Railway & Light Company controls the Mahoning & Shenango Railway & Light Company through stock ownership.

Seattle (Wash.) Municipal Railway.—A. L. Valentine, superintendent of the department of public utilities at Seattle, Wash., in a recent report states that Seattle's municipal railway lines, Division "A" and "C," were operated during the month of March at a loss of $2,136, as against a loss of $2,200 for the month of February. This brings the total deficit for the operation of the line from June 1, 1914, to April 1, 1917, to $105,008, or an average loss of more than $3,000 a month. The actual operating loss on Division "A" last month amounted to $254, while that on the Lake Burien line, Division "C," amounted to $288. An interest charge of $1,593 brings the total loss for the month on both lines to $2,136. No provision has been made to date by the Council for carrying this deficit, no item having been included in the municipal tax budget for that purpose.

United Light & Railways Company, Grand Rapids, Mich.—The United Light & Railways Company states that the Tri-City Railway & Light Company has paid off the outstanding $263,500 of first mortgage 5 per cent bonds of the Muscatine Lighting Company, and that the Tri-City Railway & Light Company first and refunding bonds are now a first lien on all the gas, electric light and power and electric railway properties in Muscatine.

United Railroads, San Francisco, Cal.—The time for the deposit of certificates of the United Railroads under the modified plan of reorganization, to which reference has been made previously in the ELECTRIC RAILWAY JOURNAL, has been extended until May 25.

Dividends Declared

Carolina Power & Light Company, Raleigh, N. C., one-half of 1 per cent, common.

Georgia Railway & Power Company, Atlanta, Ga., 2½ per cent, first preferred.

Green & Coates Street Passenger Railway, Philadelphia, Pa., $1.50.

Lancaster County Railway & Light Company, Lancaster, Pa., quarterly, 1¼ per cent, preferred; 3¼ per cent, common.

Mohawk Valley Company, New York, N. Y., quarterly, 1½ per cent.

Monongahela Valley Traction Company, Monongahela, W. Va., 1¼ per cent, common.

Public Service Investment Company, Boston, Mass., quarterly, 1½ per cent, preferred.

Ottumwa Railway & Light Company, Ottumwa, Iowa, quarterly, 1¾ per cent, preferred.

Rome Railway & Electric Company, Rome, Ga., quarterly, 1 per cent, common.

Tidewater Power Company, Wilmington, N. C., monthly, one-half of 1 per cent, preferred; 3½ per cent, common.

Washington Water Power Company, Spokane, Wash., quarterly, 1 per cent.

Western Ohio Railway, Lima, Ohio, quarterly, 1¾ per cent, first preferred.

Electric Railway Monthly Earnings

Period		Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
BATON ROUGE (LA.) ELECTRIC COMPANY						
1m., Feb.,	'17	$18,821	*$8,685	$10,136	$3,513	$6,623
1 " "	'16	17,150	*8,524	8,626	3,436	5,190
12 " "	'17	215,983	*101,794	114,189	42,148	72,041
12 " "	'16	196,290	*106,964	89,326	29,616	59,710
CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO.						
1m., Feb.,	'17	$32,362	*$21,591	$10,771	$11,435	†$664
1 " "	'16	29,922	*18,174	11,748	11,051	697
2 " "	'17	68,798	*43,724	25,074	22,873	2,201
2 " "	'16	60,822	*36,482	24,340	22,112	2,228
COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO.						
1m., Feb.,	'17	$316,318	*$224,677	$91,641	$44,961	$46,680
1 " "	'16	280,700	*165,534	115,166	44,375	70,791
12 " "	'17	3,613,173	*2,219,873	1,393,300	520,107	873,193
12 " "	'16	3,167,944	*1,871,698	1,296,246	484,332	811,914
DALLAS (TEX.) ELECTRIC COMPANY						
1m., Feb.,	'17	$179,859	*$105,253	$74,606	$40,120	$34,486
1 " "	'16	163,758	*95,660	68,098	36,573	‡33,525
12 " "	'17	2,033,646	*1,231,369	802,277	459,529	‡356,890
12 " "	'16	1,836,629	*1,130,126	706,503	411,103	‡300,599
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.						
1m., Feb.,	'17	$73,006	*$39,179	$33,827	$9,783	$24,044
1 " "	'16	64,175	*34,344	29,831	8,939	20,982
12 " "	'17	848,403	*454,299	394,104	109,456	284,648
12 " "	'16	751,425	*395,327	356,098	105,535	250,563
JACKSONVILLE (FLA.) TRACTION COMPANY						
1m., Feb.,	'17	$53,931	*$37,312	$16,619	$15,493	$1,126
1 " "	'16	50,136	*33,549	16,587	14,716	1,871
12 " "	'17	637,103	*429,440	207,663	185,495	22,168
12 " "	'16	611,470	426,708	184,762	180,385	4,377
NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.						
1m., Feb.,	'17	$197,593	*$118,630	$78,963	$40,970	$37,993
1 " "	'16	185,318	*109,648	75,670	42,897	32,773
12 " "	'17	2,408,600	*1,469,090	939,510	505,200	434,310
12 " "	'16	2,171,809	*1,336,133	835,676	512,838	322,838
PENSACOLA (FLA.) ELECTRIC COMPANY						
1m., Jan.,	'17	$27,046	*$15,653	$11,393	$7,804	$3,589
1 " "	'16	23,936	*13,773	10,163	7,751	2,412
12 " "	'17	283,211	*159,218	123,993	92,727	31,265
12 " "	'16	261,746	*147,356	114,390	86,073	28,317
PHILADELPHIA (PA.) RAPID TRANSIT COMPANY						
1m., Feb.,	'17	$2,510,812	$1,415,832	$1,094,980	$813,751	$281,229
1 " "	'16	2,255,672	1,254,493	1,001,179	816,555	184,624
9 " "	'17	21,001,095	11,779,325	9,221,770	7,328,468	1,893,302
9 " "	'16	18,862,731	10,565,708	8,297,023	7,345,864	951,159
PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.						
1m., Feb.,	'17	$459,908	*$243,101	$216,807	$181,016	$35,791
1 " "	'16	409,331	*253,092	156,239	181,166	†24,927
12 " "	'17	5,568,929	*3,030,719	2,538,210	2,178,685	359,525
12 " "	'16	5,448,097	*3,075,752	2,372,345	2,206,371	165,974
TAMPA (FLA.) ELECTRIC COMPANY						
1m., Feb.,	'17	$90,359	*$45,766	$44,593	$4,372	$40,221
1 " "	'16	90,543	*46,456	46,087	4,394	41,693
12 " "	'17	972,512	*532,768	439,744	52,351	387,393
12 " "	'16	990,048	*510,705	479,343	52,184	427,159

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*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

Fare Matter in Albany Acute

United Traction Runs Placards of Warning in Cars—Vice-President Weatherwax States Company's Attitude

The United Traction Company, Albany, N. Y., is another utility which has taken steps to enlighten the public regarding the situation which confronts it. In a statement issued by Vice-President H. B. Weatherwax, it is denied that the company seeks to establish a universal 6-cent fare on its city lines, but a readjustment of fares is said to be necessary. Mr. Weatherwax said that the company must receive more for the service it renders and that the public must be reconciled to an increased fare by the addition of 1 cent to the straight 5-cent fare, by a charge of 2 cents for transfers, by a 10-cent fare after midnight, or by the establishment of the Continental zone system. The statement by Mr. Weatherwax was made in order to avoid misunderstanding of the attitude of the company regarding the establishment of a 6-cent fare and followed comments on the matter in the public press. He said in part:

"Nothing could be more untrue than the statement that the average haul per passenger is one-quarter of a mile in this city. The average ride per passenger on the Albany division, which includes Albany and Rensselaer, is 1.64 miles. For that portion of the system in Cohoes and vicinity, the average ride per passenger is 1.88 miles, and that on the Troy line is 1.99 miles. The average ride per passenger for the entire system, exclusive of transfers, is 1.76 miles, while that including transfers is 2.16 miles.

"It is commonly supposed that the company receives the 5-cent fare from each patron, whereas, because of school tickets and free transportation granted to certain officials, it actually receives 4.04 cents per passenger. The resulting rate of fare in Albany is a trifle more than 2 cents per mile, while that for the average passenger over the entire system is a little less than that amount.

PLACARDS PLACED IN CARS

"The placard appearing in the trolley cars which bears the words 'NO LONGER CAN THE NICKEL STAND THE STRAIN' was not placed there to convey the impression that we are going to ask for a 6-cent fare or any change in fare immediately or in the near future. It is hoped that we will not have to change any fare, but the future prosperity of the company will determine that. It should be quite apparent that a public utility corporation cannot continue to pay thousands of dollars more each year for what it must buy and thousands more for taxes and wages without eventually changing the price of what it has to sell, namely, transportation.

"The tenth annual report of the Public Service Commission for the year 1916 shows that, for traction operation throughout the State during the years from 1908 to 1915, inclusive, revenues increased 43.9 per cent, operating expenses 40.2 per cent, and the net corporate income decreased 58.2 per cent. During the same period revenues of the United Traction Company have increased 20 per cent, operating expenses 64 per cent, and the net corporate income has decreased 115 per cent. This condition was brought about entirely through increased expenses for paving, taxes, materials and wages.

"It makes no difference what the capital stock of a corporation may be, whether $1 or $1,000,000, if the results of a year's operation show an absence of net income, and operating expenses to have increased three times as fast as revenues, that company cannot serve the public without additional food in the form of money. We want the public to understand the situation and I am sure that then they will treat us as fairly as they would a grocer, druggist or other merchants, or a hotel or a theater, if their respective prices were raised."

Changes Recommended for Boston

Commission Issues Comprehensive Memorandum Outlining the Present Needs of the Boston Elevated and Urges Public Co-operation

In a statement made on April 10 the Public Service Commission of Massachusetts outlined several desirable improvements, some of which are under way, in the service of the Boston Elevated Railway. The present congestion has resulted largely from the unusual increase in traffic in the last eight months, which was nearly 70 per cent greater than for the corresponding period a year ago. Additional cars and track facilities are essential, and the company's recent orders for new equipment were cited as evidence that the management is endeavoring to meet the situation.

Substantial relief will be afforded by the opening of the Dorchester tunnel to Andrew Square, by the opening of the Everett elevated extension, and by the operation of 100 center-entrance cars in the East Boston tunnel and of 87 new rapid-transit cars. At least 100 new surface cars are needed in addition to those already ordered. The elimination of small surface cars of the old type is desirable, and the company has asked for bids for the construction of surface cars of the center-entrance type and trail cars similar to those now in service. The commission recommended increasing the number of eight-car trains operated on the Sullivan Square route, where the minimum headway is two minutes. Delay is incurred by the absence of a loop at the Forest Hills terminal and by the necessity for cleaning the rear car used as a smoker, as it becomes the first car of the in-bound train. Door-closing contacts to signal the motormen are replacing the bell cord. The commission considered the abolition of the smoking car. This is favored by the company and by many patrons.

It was further proposed to reduce the number of passengers loaded per car at congested stations and transfer points and the turning back of cars on certain routes at intermediate points; to provide enough cars to give each passenger a seat during non-rush hours; to construct a prepayment area at Maverick Square, East Boston, and a loop at City Point, South Boston; to give more attention to car maintenance and to enlarge the platforms for surface cars at the Harvard Square station of the Cambridge subway. The commission pointed out the desirability of special legislation to enable the company to purchase additional rolling stock.

Harrisburg Jitney Men Testify

At a hearing on March 14 in the case of the Harrisburg (Pa.) Railways against the jitney men of that city, it was decided that the latter file applications for certificates of public convenience without admitting that they are common carriers pending a hearing on this point at a later date. This case has been continued by the Public Service Commission and after taking the testimony of seventy-six operators the hearing was closed on April 13. The testimony will be transcribed and thoroughly analyzed by the commission. The jitney men have fifteen days in which to file a brief with the commission, after which the latter will render its decision. In the event the decision is adverse to the jitney men, the case may then be tried by law to decide whether or not the certificates will be granted. In the meantime the jitneys will continue to operate.

In answer to questions by Attorney Bailey, for the company, as to whether the applicants had any property for security in case a jitney passenger or a pedestrian should be injured through their operation, one witness said he had no real estate, but that he had $7,000 cash in the bank. Another stated that he had property worth $25,000. E. C. Hawthorne, president of the Jitney Indemnity Association, testified in this connection that the constitution and by-laws of that association make the members liable for any accident claims. To this end each member contributes to a fund and two claims have already been paid. Claims are to be satisfied by assessments if there is not sufficient money in the fund.

Damage Suit Threatened

The Winnipeg (Man.) Electric Railway is likely to start action against the city of Winnipeg to recover $1,000,000 damages incurred through unfair jitney competition. The company contends that the city has permitted and encouraged jitney operation which is contrary to franchise privileges held by the company for all transportation facilities. It is alleged that during the last two years of jitney competition $545,747 has been paid to the city for taxes, percentage payments on gross revenue, and pavement charges. Taxes on cars have amounted to $12,920, and it has cost $20,000 to keep the tracks free from snow, which has provided a clear way for the jitneys, and there have been other losses in revenue. Unless the City Council takes immediate steps to carry out the existing contract, the company proposes to withhold all payments to the city and to attempt to recover the amount lost during the period the city has permitted the jitneys to operate practically without restriction.

Wilford Phillips, general manager of the company, in a letter to the Council outlined some of the company's expenditures and added, in part: "On the other hand, the jitneys are allowed free and unlimited competition upon payment of the sum of $20 per car per year. The company is at a loss to understand why the Council objected to the legislation proposed by the province of Manitoba to bring the jitneys under the control of the Public Utilities Commission. It has always provided for the citizens of Winnipeg a first-class street railway system, which ranks high with others on this continent. The result of permitting jitney competition to continue will be to so embarrass the company financially that it will not be able to procure capital to make extensions to the system and it will not be able to provide efficient and up-to-date service as it has in the past."

Lincoln Traction Wants Higher Fares

The Lincoln (Neb.) Traction Company has filed an application with the State Railway Commission for permission to charge a straight 5-cent fare instead of the present rate of six tickets for 25 cents with a reduced rate for school children. The company alleges that the fare now in force is inadequate to meet the present cost of operating with due margin for contingencies and a fair return to stockholders. In a statement supplementing the application W. E. Sharp, president of the company, said that if the increase is allowed the company will advance the wages of its employees and use the balance of the increased revenue to purchase improved equipment. It is stated in the application that the decrease in revenue is due largely to the increased use of automobiles, which is also responsible for a large proportion of the increased number of accidents.

According to the company's statement the total of fares collected during the year ended March 1 was $563,825, of which 60 per cent represented the sale of tickets. On coal used during the past year there was an increase in price amounting to $40,000 over the previous year, while the taxes of the company increased from $32,188 for the year 1912 to $40,348 for 1916. The net income for the year ended March 1 was $149,902, with no allowance for depreciation, and it will require $144,024 to pay interest on the bonds of the company and dividends on preferred stock.

Bay State Wins Service Case

The Public Service Commission of Massachusetts has issued a decision in favor of the Bay State Street Railway, Boston, Mass., on the petition of the Selectmen of East Bridgewater for the restoration of a previous schedule on the Montello-Bridgewater line. In October, 1916, an hourly service was substituted for half-hourly operation over a considerable portion of the route during normal hours. Traffic in the zone between East Bridgewater and Bridgewater is light and the receipts per car-mile on the route in the past three years were only 21.81, 20.50 and 20.91 cents. In view of this fact the board did not feel justified in ordering the increased service, but suggested improvement in the condition of equipment and track.

Jitney Men Form Insurance Company

F. B. Cliphouse, secretary of the Spokane Jitney Men's Union, Spokane, Wash., reports the organization of 500 jitney operators into the Mutual Union Insurance Company, which will be able to write bonds for jitney men by May 1. The new company will be organized to do an accident bonding business in Washington and for a time will be only a mutual concern. The plan of organization, financing and operation is worked out and has been approved by the state insurance department. The jitney men must pay $30 immediately upon joining the company and $10 a week until they have paid a total of $200. It is thought that this organization will be able to control and expand the business more than has been done previously. Secretary Cliphouse states that the jitneys will be made to adhere to certain routes and to maintain certain schedules. The probable difficulty of obtaining bonds, resulting from a recent Supreme Court decision, was noted in the issue of the ELECTRIC RAILWAY JOURNAL for April 7, page 666.

New Fare System on L., A. & W.—The Rooke automatic coin register has recently been put into service on the Lewiston and Augusta lines of the Lewiston, Augusta & Waterville Street Railway, Lewiston, Me.

A Quick-Witted Conductor.—The following item is said to have originated in Harrisburg: "A passenger boarding a pay-as-you-enter trolley car at edge of city handed the conductor a big potato for his fare. The conductor gravely opened a lunch box and gave him a small roll as change."

Jitneys Lose in Court.—In a suit brought by the Memphis (Tenn.) Street Railway asking an injunction against the jitneys the Court of Appeals of that city has sustained the action of the chancellor in declaring that the franchise under which the jitney buses were operated in Memphis is void. A written opinion was filed in the case.

Scranton Jitney Operators Summoned.—Complaints have been received at Harrisburg, Pa., that certain jitney operators in Scranton were ignoring the order of the Public Service Commission requiring them to take out certificates of public convenience. Several jitney operators have been ordered to appear at the Capitol on April 26 to answer the charge.

Railway to Install Bus.—The Alabama Power Company, operating the railway lines in Anniston, Ala., has arranged to install an auto bus, which will connect with the North Noble car line in Anniston and extend to Blue Mountain, going within 300 yards of Edgemont Cemetery. The fare from Anniston to Blue Mountain by railway and bus will be 5 cents.

Reduced Fare Proposed.—The Fort Smith Light & Traction Company, Fort Smith, Ark., has announced a reduction in fare from 10 cents to 5 cents on its line from Fort Smith to South Fort Smith, a manufacturing suburb. The reduction will be effective for sixty days, as an experiment, and will be continued if found to be for the best interests of the company.

Disks Replace Tickets in St. Louis.—On April 1 the United Railways, St. Louis, Mo., substituted small metal disks, the size of a nickel, for the ticket books which have been issued to city officials, the members of the police department, and others, for the use of employees. The new disks have a hole in the center, and bear the words "United Railways Company, one ride."

Skip-Stop Adopted in Baltimore.—The United Railways & Electric Company, Baltimore, Md., put the skip-stop system in operation on two of its lines on April 15, and has requested the public to give the plan a fair trial. Great care has been exercised in the selection of the stops in order that the convenience of patrons may not be sacrificed. All stops have been retained in the downtown district.

Street Signs to Give Schedules.—The signboard system giving street car schedules, which has recently been tried by the Athens Railway & Electric Company, Athens, Ga., a subsidiary of the Cities Service Company, has proved entirely successful. The signboards placed at corners indicate at all times of the day when cars will pass in either direction. The scheme has received very favorable comment.

Parlor Cars for Texas Electric.—The proposed parlor-car service for the Texas Electric Railway, the consolidated Strickland Lines, Dallas, Tex., will be inaugurated on May 1 on the line between Denison and Waco. The type of chairs and other equipment has been selected, and the installation will be done in the company's shops near Dallas. An extra charge of 35 cents will be made between Dallas and Waco for accommodation on these cars.

Anti-Smoking Rule Repealed on B. R. T.—The Public Service Commission for the First District of New York has approved the customary application of the various companies in the Brooklyn Rapid Transit System for the partial suspension of the anti-smoking order on the surface cars of that system between May 1 and Oct. 25. The privilege of smoking will be permitted on the four rear seats of open and convertible cars.

Information Book for Evansville.—The Public Utilities Company, Evansville, Ind., has issued a small booklet which gives directions on how to reach all the city factories, which are listed alphabetically. It also contains the interurban timetables and directions on the front cover as to what street cars run to the different depots. This booklet has been distributed by the police department and in the hotels, restaurants, stores and various other places.

Three-Cent Fare Increase Proposed.—The Montoursville (Pa.) Passenger Railway, which connects Montoursville and Williamsport, has filed with the Public Service Commission of Pennsylvania a copy of its new tariffs and schedules to become effective May 1. The fares have been increased 3 cents over the former 5 and 7-cent units. This was found necessary on account of the present high prices for materials and the recent advance in wages granted to all employees in order that experienced operators could be retained.

Railway Office Adds Bureau for Travelers.—The Union ticket office of the San Diego Electric Railway, San Diego & Southeastern Railway and San Diego & Arizona Railway in San Diego, Cal., has increased its usefulness to the traveling public and visiting tourists by the addition of an information bureau from which is supplied information about pleasure trips and points of interest in the city. Pamphlets giving information regarding combination trips taken by rail, auto, trolley and by boat are also distributed from the bureau.

Fare Increases Further Suspended.—The Public Service Commission of the Second District of New York has issued orders dated April 12 suspending until May 15 the effective date of proposed increases in passenger transportation rates by the Fonda, Johnstown & Gloversville Railroad. The commission has also extended the date for similar increases by the Schenectady Railway until June 15. As reported in the issue of this paper for Feb. 10, page 271, the commission on Jan. 25 suspended these proposed rates until April 15 in order to investigate the reasonableness of the fares.

Skip-Stop Recommended for Buffalo.—The special municipal traffic committee appointed by the Mayor of Buffalo to recommend new traffic laws has suggested the trial of skip-stop service on two lines of the International Railway. The committee has also recommended the laying of extra tracks in certain downtown streets to facilitate the loading of passengers at congested transfer points, the construction of a frame shelter at Shelton Square, and the removal of certain lines from the congested business district. Thomas Penney, vice-president of the International Railway, is a member of the committee. The recommendations are being considered by officials of the company.

Traffic Increasing on Chicago-Milwaukee Line.—During the first three months of the current year the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., realized an increase in earnings of about 40 per cent over the same period in 1916. This increase was due largely to the growth in the long-haul and through-passenger business. Another source of revenue is the increased traffic due to the present activity at the Great Lakes Naval Training Station, located on the lines of this company. During the last nine days of March the company sold $439 worth of tickets to individual marines. The company is also receiving a good share of the government business in transporting men to and from this training school.

Legal Notes

ILLINOIS.—*Injury to Negligent Workmen Under Compensation Act.*

A motorman who was killed when the car suddenly started and struck him while he was standing on the ground in front of it, attempting to adjust the trolley so as to furnish current, was killed by an accident "arising out of and in the course of his employment," and compensation may be allowed under the workmen's compensation act of 1913, though the motorman was violating the rules of the railway company. (Chicago Railways v. Industrial Board of the State of Illinois, 114 Northeastern Rep., 534.)

INDIANA.—*Injury to Passenger Boarding Moving Car.*

Where a passenger sought to board a street car which was moving slowly, and indicated this desire to the conductor, who expressly invited him to become a passenger, and while he was actually on the steps of the car mounting to the vestibule, it was negligence for the conductor to signal for an increase of the speed of the car, without giving the passenger a reasonable opportunity to mount the steps in safety, even though the place was not a regular stopping point. (Union Traction Co. of Indiana v. McVey, 114 Northwestern Rep., 438.)

INDIANA.—*Injury to Local Passenger by Express Car.*

Where an interurban railway, by its manner of operating, extended to patrons an invitation to station themselves at a crossing near the track within a reasonable time before the arrival of a local car and to signal such car by lighting a match or bit of paper, the road was under duty to exercise reasonable care, in the operation of express cars past such point, for the safety of those waiting there. (Indiana Union Traction Co. v. Hiatt, 114 Northeastern Rep., 478.)

KENTUCKY.—*Liability of Employing Company for Negligence of Subsidiary.*

In an action against a railway company for the death of its servant while emptying the cash boxes of cars of a traction company in which the railway company owned a majority of stock, the fact that the decedent was an employee of the railway company, whether he was working directly for it or performing some service for the traction company, was sufficient evidence to prove the liability of the railway company. (Evansville Railways v. Ligon's Adm'r., 180 Southwestern Rep., 898.)

MARYLAND.—*Passenger Thrown from Platform on Curve.*

Where a passenger, for his own convenience in smoking, chose to stand near the open door of a platform of an interurban car after being requested to step inside, the railway company was not liable for his death by being thrown from the car as it swayed, going around a curve at a speed not excessive. (Hagerstown & Frederick Railway v. State, for use of Cunningham, 99 Atlantic Rep., 376.)

MASSACHUSETTS.—*Passenger Injured While Boarding Car at Wrong Place.*

A railway company is not liable for injuries to a person who attempts to board its street car at a place other than the usual stopping place, in the absence of any invitation from the platform men, and when they did not see him or were not chargeable with having knowledge of his presence. (Nuttall v. Worcester Consolidated Street Railway, 114 Northeastern Rep., 292.)

MISSOURI.—*Death Caused by Unlawful Obstruction.*

A street railway which made unlawful or negligent excavation obstructions in a street, which directly caused the death of a twelve-year-old boy without any negligence on his part, is liable, notwithstanding the fact that the team which the deceased was driving had become frightened and were not fully under his control at the time the accident occurred. (Dugdale v. St. Joseph Railway, Light, Heat & Power Company, 189 Southwestern Rep., 830.)

Personal Mention

Frank F. Janes has been appointed chief clerk to M. C. Sauerwein, general manager of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y.

W. G. Murrin, acting general superintendent of the British Columbia Electric Railway, with headquarters at Vancouver, has been made assistant to the general manager.

W. A. Whitney, formerly of the Union Pacific Railroad, has become general manager of the Ogden, Logan & Idaho Railway, Ogden, Utah, succeeding P. D. Kline, who resigned recently.

J. B. Hardy has been appointed chairman of the public utilities committee of the City Council of Fort William, Ontario, which operates the Fort William Electric Railway.

E. F. Kelley, formerly purchasing agent of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., has assumed the duties of chief clerk to the general manager of the Schenectady (N. Y.) Railway.

W. M. Thwing, who for several years has been claim and tax agent of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., has assumed, in addition to his former duties, those of general traffic agent, a new position.

George B. Woods, heretofore vice-president of the London & Lake Erie Railway & Transportation Company, London, Ontario, has been elected president of the company, succeeding W. K. George, who resigned on account of other duties.

E. A. MacMillan, formerly master mechanic for the Fort William (Ont.) Electric Railway, has been appointed general superintendent of the Stroudsburg Passenger Railway, and the Stroudsburg, Water Gap & Portland Railway, Stroudsburg, Pa.

Martin N. Todd, president of the Galt, Preston & Hespeler Street Railway, and general manager of the Lake Erie & Northern Railway, Galt, Ont., has returned to his duties much improved in health after spending several weeks in New Orleans and Southern points.

Joseph L. Tully has been appointed assistant superintendent of the Worcester division of the Worcester (Mass.) Consolidated Street Railway. This is one of several promotions Mr. Tully has received since 1903, when he entered the employ of this company as clerk.

James F. Hamilton, who was recently appointed general manager of the Rochester lines of the New York State Railways, was tendered a complimentary banquet at the Rochester Club by officials of the Rochester Railway & Light Company and the New York State Railways.

Henry Cordell has for some time been serving tentatively as master mechanic of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., at the Highwood shops. Mr. Cordell was for twelve years previously general foreman of the Wilson Avenue shops of the Chicago (Ill.) Elevated Railways.

R. P. Stevens has been elected vice-president and a director of the Republic Railway & Light Company, Youngstown, Ohio, succeeding George A. Galliver, resigned. This will not interfere with Mr. Stevens' duties as president of the Mahoning & Shenango Railway & Light Company, which is a subsidiary company.

W. N. Warburton, general manager of the London & Lake Erie Railway & Transportation Company, London, Ontario, has been elected secretary-treasurer in addition to his other duties. In his new capacity, Mr. Warburton succeeds Leonard Tait, who recently became secretary-treasurer of the London (Ont.) Street Railway.

William L. Ransom, justice of the City Court of New York, has been appointed counsel on the Public Service Commission of the First District to succeed George S. Coleman, resigned. Mr. Ransom has had a wide legal experience which will be of unusual benefit in his new position. He will enter upon his duties for the commission on April 23.

Philip J. Kealy, president of the Kansas City (Mo.) Railways, and colonel of the Third Regiment Missouri National Guard, has started a movement in Kansas City for an adequate armory. He has aroused much enthusiasm through his manner of starting the subscription list. He offered $4,000 as his personal contribution, this being the amount of his annual salary which he receives as colonel of the regiment.

J. R. PRATT

James R. Pratt has been promoted from the position of assistant general manager of the United Railways & Electric Company, Baltimore, Md., to that of vice-president and general manager, succeeding T. A. Cross. Mr. Pratt has spent most of his business career in the local electric railway field in Baltimore and has risen to his present position from a beginning as conductor for the old Baltimore Traction Company. From his work as conductor Mr. Pratt advanced to a position in the claim department and continued in that work after the formation of the United Railways & Electric Company in 1899 as a consolidation of all the electric railway properties in Baltimore and vicinity. While he was actively engaged in claims work Mr. Pratt studied law and after his graduation was made assistant claim agent of the company. His later appointments were those of assistant to the general manager, claim agent and finally assistant general manager, the position which he has just relinquished.

John Catherman, formerly one of the sales engineers of the Buda Manufacturing Company, Chicago, has been appointed assistant superintendent of track and roadway for the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. Mr. Catherman was graduated from Bucknell College. In 1909 he was employed by the Illinois Traction System as an engineer in the bridge and building department, devoting his time largely to the design of steel and reinforced concrete structures. In 1911 he became assistant engineer of maintenance of way on the same property continuing in that capacity until 1916, when he took up sales work with the Buda company.

H. B. FLOWERS

Herbert B. Flowers has been elected assistant general manager of the United Railways & Electric Company, Baltimore, Md., succeeding James R. Pratt. Mr. Flowers was graduated from the Law School of the University of Michigan in 1903 and from the Engineering School in 1905. He immediately entered the operating department of the Detroit (Mich.) United Railway, becoming assistant superintendent successively of the Orchard Lake and the Pontiac divisions. In these capacities he was a member of the staff of Sir Albert Stanley, general superintendent, who since has been at the head of the London Underground Railways and is now in the British cabinet. Mr. Flowers went to Baltimore seven years ago as assistant superintendent of transportation of the United Railways and held this position until his recent promotion. He is a member of the training of transportation employees committee of the American Electric Railway Association, and is also a member of the Merchants & Manufacturers' Associtaion, the Baltimore Rotary Club and several other local clubs in Baltimore.

Frank R. Schneider, heretofore secretary to Edward T. Moore, who is general manager of the Dallas (Tex.) Street Railway and of the Dallas Electric Light & Power Company, has been promoted to the position of assistant to R. T. Sullivan, the newly-appointed general manager of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. Mr. Schneider went to Dallas four years ago from Houston, where he had been general passenger agent of the Galveston-Houston Electric Railway. Before assuming that position, Mr. Schneider was secretary to David Daly, general manager of the Houston Electric Company. These companies are all Stone & Webster properties. The company with which he becomes connected at Youngstown is controlled by the Republic Railway & Light Company. It operates about 200 miles of lines, city and interurban, in Youngstown and vicinity, extending into Pennsylvania, and also furnishes power for lighting and commercial purposes throughout this iron and steel district.

F. R. SCHNEIDER

Robert Knight, assistant superintendent of the electric light and power department of Edmonton, Alberta, and formerly superintendent of the street railway department, has resigned to join the army service corps. Mr. Knight is a native of Scotland, but has had a wide experience in electrical enterprises in this country. He is an associate of the American Institute of Electrical Engineers. Before he left to join the forces for service over sea, the men with whom he had been associated presented him with a handsome wrist watch.

Thomas A. Cross, for several months acting president of the United Railways & Electric Company, Baltimore, Md., has been formally elected to that position, succeeding William A. House. Mr. Cross was formerly vice-president and general manager of the company. He was born in Baltimore and has been engaged in electric railway work with the United Railways & Electric Company and its predecessors since 1891, when he entered the employ of the North Avenue Electric Railway. His advancement to the position of president is a deserved acknowledgment of years of faithful service to the company, in recognition of his intimate knowledge of the company's affairs through that service, and takes into consideration the value to the company of a man fully acquainted with the viewpoint of the citizens of the community, of which Mr. Cross has himself been so long a part. Following his connection with the North Avenue Electric Railway, Mr. Cross later engaged in engineering capacities successively for the Lake Roland Elevated Railway, the Baltimore Traction Company, the City & Suburban Railway and the Consolidated Electric Railway, all of which through consolidation became the United Railways & Electric Company in 1899. After the last-mentioned company was formed Mr. Cross was retained as superintendent of overhead construction and in 1907 was appointed general manager. He retained this position until May, 1911, when he was elected, in addition, second vice-president of the company. In January, 1916, Mr. Cross assumed also temporary charge of the duties of president, succeeding William A. House, who had received an indefinite leave of absence.

T. A. CROSS

Obituary

George Dunnington, until a month ago chief clerk in the department of credits and collections of the Puget Sound Traction, Light & Power Company, Seattle, Wash., died at his home in that city on April 7.

William V. Corwin of Corwin, N. Y., one of the founders of the plan to construct the Lockport and Olcott division of the International Railway, Buffalo, N. Y., and its first general freight agent, died on April 12. He was eighty-five years old.

George P. Germain, who retired from the insurance business in Buffalo, N. Y., twelve years ago to become associated with the claim department of the Metropolitan Street Railway, New York, died at his home in East Aurora, N. Y., on April 10, at the age of seventy-five. Mr. Germain retired from business three years ago, and had been in ill health for several months.

J. E. Allison, for many years a member of the department staff of the Seattle Electric Company and of the Puget Sound Traction, Light & Power Company, Seattle, Wash., in the capacities of employment agent and superintendent of inspection, died at his home in Seattle on March 30. Mr. Allison was a veteran in the service of the Seattle Electric Company before the consolidation of the lines there. About three years ago he resigned owing to failing health, and since that time had had the refreshment and store privileges of the Yesler Way cable station, a popular lakeside resort.

James B. Brady, New York, N. Y., died in Atlantic City, N. J., on April 13 from stomach disorders from which he had suffered for several years. Mr. Brady was born in New York in 1855 and was at one time a messenger boy for the New York Central Railroad. He began his successful business career with Manning, Maxwell & Moore, machinery manufacturers, and was a director of that company when he died. He was a vice-president of the Standard Steel Car Company, the Keith Car & Manufacturing Company and the Osgood-Bradley Car Company and a director of several other railway appliance manufacturing companies. In gratitude for his treatment in 1912 at the Johns Hopkins Hospital in Baltimore, Mr. Brady presented that institution with $200,000 for the extension of its facilities, and he had given liberally toward its support since that time.

Strike on Key Route Ferry

No ferry boats were operated on April 12 by the San Francisco-Oakland Terminal Railways. Suspension of service was caused by the walkout of all licensed ferry employees, including captains, officers and engineers. The men had been negotiating for some time for shorter hours and an agreement had been reached on the first demands. A statement was subsequently sent to the company, however, requesting a still more favorable change and after making this demand the men refused to allow time for the matter to be placed before the company's board of directors. All hands "resigned" after the last trip of the day.

Pending a readjustment the Key System planned to take care of its regular traffic by redeeming all tickets with others good on Southern Pacific boats, which were not affected by the strike. The Oakland, Antioch & Eastern Railway, which depends upon connections with Key Route boats, chartered boats to ferry passengers coming from its main line points and destined for San Francisco. Service was re-established on the following morning.

The dispute about hours arose from the fact that when the new State law went into effect on April 1 the working day was limited to thirteen hours and the company established the schedule of twelve hours on and twelve hours off. The men demanded and were granted an arrangement of eight hours on and sixteen hours off. This required one additional crew and increased the annual cost to the company $21,000. The final demand which caused the tieup was for twelve hours on and twenty-four hours off. This would have required two additional crews and would have increased the annual cost to the company about $48,000. The latter plan has been agreed to temporarily, pending the arbitration of differences between the company and its employees.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

Mobile-Pensacola Railway & Navigation Company, Mobile, Ala.—Incorporated to take over the Mobile, Volanta & Pensacola Railroad. Capital stock, $10,000. Officers: Charles Barclay, president; M. H. Miller, vice-president, and W. D. Stapleton, secretary and treasurer.

Globe-Miami Railway, Globe, Ariz.—Incorporated to construct a line between Globe and Miami. Officers: Harvy T. Lynch, Independence, Iowa, president; J. J. Mackey, Miami, vice-president; Edgar Sultan, Globe, secretary-treasurer, and Frank J. Dains, Kansas City, Mo., general manager. [April 7, '17.]

Gary & Hobart Traction Company, Hobart, Ind.—Incorporated in Indiana as the successor to the Gary, Hobart & Eastern Traction Company, the property of which was sold under foreclosure some time ago. Capital stock, $60,000. Officers: Ora L. Wildermuth, president; Adlai T. Ewing, secretary, treasurer and general manager; Ora L. Wildermuth, Adlai T. Ewing, William Earle, Harold Stratton and Grant Crumpacker, directors.

FRANCHISES

Savannah, Ga.—The Savannah Electric Company will ask the City Council for a franchise to construct an extension south on Abercorn Street to Fifty-first Street and west on Fifty-first Street to Barnard Street.

Harvard, Ill.—The Chicago, Harvard & Geneva Lake Railway has received a franchise from the City Council of Harvard to construct a line along West Front Street, between West Diggins Street and South Eastman Street.

Wilmette, Ill.—The City Council of Wilmette has passed an ordinance granting the Chicago, North Shore & Milwaukee Electric Railroad a twenty-year extension of its franchise.

Cincinnati, Ohio.—The Council committee on street railroads is preparing ordinances to be submitted to the City Council providing for fifteen proposed extensions by the Cincinnati Traction Company. The total cost of the extensions is estimated at $2,000,000. The committee will also recommend to the Council for passage an ordinance providing for the double-tracking of Central Avenue between Fourth Street and Freeman Avenue.

Cincinnati, Ohio.—The West End Rapid Transit Company will receive a year's extension of time on its franchise to construct a line from Anderson's Ferry to Third and Race Streets.

Philadelphia, Pa.—The city of Philadelphia has received a certificate of public convenience from the Public Service Commission of Pennsylvania for the construction of the northern end of the Frankford elevated line from Dyre to Rhawn Street. The commission has deferred considering applications for certificates authorizing the remainder of the proposed high-speed lines until the present legislative session is concluded.

***Beaumont, Tex.**—L. P. Featherstone, president of the Texas Steel Company, has received a franchise from the City Council of Beaumont to construct an electric railway from the end of the Magnolia Avenue car line of the Beaumont Traction Company to the Texas Steel Company's plant north of the city.

Green Bay, Wis.—The Green Bay & Eastern Railway has received a certificate of convenience and necessity from the Wisconsin Railroad Commission for the construction of its proposed line from Green Bay to Manitowoc and Sheboygan. William M. Willinger, Manitowoc, president. [April 29, '16.]

TRACK AND ROADWAY

***Darwin, Cal.**—The Darwin Development Company plans to construct a 23-mile electric railway along the south shore of Owens Lake, to connect with the Southern Pacific Company at Olancha.

Municipal Railways of San Francisco, San Francisco, Cal.—The Board of Supervisors has unanimously adopted the resolution appropriating $116,000 of the Municipal Railways funds for the construction of tracks to connect the Van Ness Avenue and Church Street lines.

Santa Barbara & Suburban Railway, Santa Barbara, Cal.—This company will construct a temporary track from Fourth Avenue and Bath Street out on Alamar Avenue to the south side of the Hollister Avenue bridge at the city limits to provide transportation facilities to the citizens' training camp.

***Davista, Fla.**—The St. Petersburg Investment Corporation will soon begin the construction of an electric railway from Davista to Gulfport.

***Chicago, Ill.**—It is reported that a company will be organized with a capital stock of $50,000 to construct an electric railway from Chicago to St. Louis through Decatur, Clinton, Farmer City, Bellflower, Saybrook and Anchor City. J. H. Shirley, 4139 Manhattan Avenue, St. Louis, Mo., is interested.

Gary & Interurban Railroad, Gary, Ind.—The International Trust & Savings Bank of Gary, the First National Bank of Hammond, the Indiana Harbor National Bank and the First Trust & Savings Bank of East Chicago will furnish $114,000 for improvements to the system of the Gary & Interurban Railroad in Gary, including a new substation, additional cars and loops, and to take up $51,000 in outstanding certificates already issued by Charles D. Davidson, receiver. The court has authorized the receiver to issue additional certificates up to $250,000.

Tri-City Railway, Davenport, Iowa.—Provision has been made for a car line on Seventeenth Street from Eighteenth Avenue to Twenty-third Avenue by the board of local improvements of Rock Island. The street has been changed from a width of 27 ft. to a 40-ft. wide drive with an 8-ft. boulevard in the center and a 16-ft. roadway on each side. The boulevard was planned with the intention of using it later as a right-of-way for the Tri-City Railway when a street car line is extended in that direction. It is believed that when the line is built on Seventeenth Street it will connect with the Watch Tower line and may form a loop. There has also been some discussion of a line in Moline, adjacent to Rock Island, being looped so as to connect with the Tower line.

***Interstate Traction Company, Independence, Kan.**—This company has been organized at Independence to construct an electric railway from a point near Jefferson, south of Independence to Collinsville, Okla., via Tyro and Caney, Kan., and Copan, Dewey and Bartlesville, Okla., about 8 miles. It will then be extended to Nowata. A. W. Schulthies, Independence, president.

Kansas City (Mo.) Railways.—Contracts have been awarded by the Kansas City Railways for six extensions amounting to $342,900 to the Columbia Construction Company, Kansas City. The contract for the line over the Broadway viaduct was let to Littlefield, Fry & McGough, Chicago, and the same firm was awarded the contract for the reconstruction of the Sunset Hill line, these two items totaling about $17,000.

Southwest Missouri Railroad, Webb City, Mo.—Construction has been begun by the Southwest Missouri Railroad on its extension from Galena to Baxter Springs. The contract for the construction of a bridge over Spring River has been let to the Topeka Bridge & Iron Company, and this work is now in progress. It is expected that the line will be placed in operation by Nov. 1.

Moncton Tramways, Electric & Gas Company, Ltd., Moncton, N. B.—The system of the Moncton Tramways, Electric & Gas Company, Ltd., will probably be materially extended in the near future. E. B. Reeser, general manager, has submitted certain proposals for additional track routes which are under consideration by the Council.

Public Service Railway, Newark, N. J.—The Board of Public Utility Commissioners of New Jersey has granted the Public Service Railway permission to issue $2,000,000 in capital stock for extensions.

Chautauqua Traction Company, Jamestown, N. Y.—Work will be begun at once by the Julian-Beggs Signal Company, Terre Haute, Ind., on the installation of a signal system on the lines of the Chautauqua Traction Company.

New York, N. Y.—Sealed bids or proposals for the supply of untreated ties and timber for use in the construction of rapid transit railroads will be received by the Public Service Commission for the First District of New York until May 2. The quantity of ties and timber desired is approximately 840,000 feet board measure. A description of the materials and other requirements, provisions and specifications may be obtained at the office of the commission.

Long Island Railroad, New York, N. Y.—This company will electrify its Evergreen branch in Brooklyn and Queens boroughs, about 1½ miles.

Cleveland (Ohio) Railway.—The City Council of Cleveland recently approved the street railway committee's recommendation for the expenditure of $517,164 in relaying track on twelve streets by the Cleveland Railway. Street Railway Commissioner Sanders asked authority for the company to build a double-track extension to the East 156th Street line from Lake Shore Boulevard to Waterloo Road. Owners of Euclid Beach Park have proposed to pay $30,000, or about half the cost of this improvement.

Oregon Electric Railway, Portland, Ore.—The Oregon Electric Railway will shortly begin the construction of a railroad bridge at Wilsonville across the Willamette River.

Lehigh Valley Transit Company, Allentown, Pa.—It is reported that this company plans to spend about $135,000 for improving its lines.

Denver & Ephrata Street Railway, Denver, Pa.—Work will be begun this spring by the Denver & Ephrata Street Railway on its proposed line between Denver and Ephrata, 4.7 miles. H. S. Dissler, Denver, president. [Feb. 3, '17.]

Northwestern Pennsylvania Railway, Meadville, Pa.—It is reported that the Northwestern Pennsylvania Railway contemplates the construction of an extension from Titusville to Cambridge Springs during the coming summer.

Philadelphia, Pa.—Bids were opened April 3 by the Department of City Transit of Philadelphia for sections of the Broad Street subway. The lowest bidders on the following sections were: Contract No. 103—757 linear feet of two-track and 2500 linear feet of four-track subway in Broad Street, from south of Filbert Street to Buttonwood Street, including one station, Keystone State Construction Company, Philadelphia, $2,815,240; contract No. 104—4086 linear feet of four-track subway in Broad Street, from Buttonwood Street to north of Stiles Street, including three stations, Philadelphia Subway Construction Company, Philadelphia, $2,885,941; Contract No. 204—2960 linear feet of four-track subway merging into two-track subway in Broad Street, from South Penn Square to south of South Street, including two stations, Keystone State Construction Company, $3,336,400. Awards of contracts are being withheld pending action by the Public Service Commission of Pennsylvania.

Bristol (Tenn.) Traction Company. — Improvements are contemplated by this company to its Holston Valley line.

Emigration Canyon Railroad, Salt Lake City, Utah.—A petition has been filed by the Emigration Canyon Railroad with the Public Utilities Commission for permission to tear up its track, remove its poles and wires and to abandon its right-of-way from Mount Olivet Cemetery to Pinecrest Inn.

***Graham, Va.**—The Bluefield (Va.) Chamber of Commerce, L. H. Duncan secretary, is promoting plans for the construction of an electric railway from Graham to Welch, W. Va., 53 miles, via Bramwell, Pocahontas, Boissevain, North Fork, Keystone, Gary and other points. The cost is estimated at about $4,000,000.

Hampton & Langley Field Railway, Hampton, Va.—The contract for the grading of this company's line from Hampton to the Langley aviation field has been let to Gannaway-Hudgins Company, Hampton. J. N. Shannahan of the Newport News & Hampton Railway, Gas & Electric Company, president [March 10, '17.]

Tacoma, Wash.—Definite plans have been formulated for the construction by the city of Tacoma, Wash., of an extension of the present municipal tideflats line from its present terminus to the plant of the Todd Shipbuilding & Construction Company. The city will build the line and furnish the rolling stock and the Tacoma Railway & Power Company will operate it under an agreement similar to the one now in force covering the operation of the present line. The plan calls for an expenditure of about $160,000, which will be covered by utility bonds. An order has been placed for 12,000 ft. of trolley wire for the extension.

SHOPS AND BUILDINGS

Connecticut Company, New Haven, Conn.—This company will construct a new freight station on Electric Avenue, Thomaston.

Interborough Rapid Transit Company, New York, N. Y.—Plans and specifications for the new terminal to be constructed by the Putnam Division of the New York Central Railroad and the Interborough Rapid Transit Company have been approved by the Public Service Commission for the First District of New York. The new terminal is to be just west of Sedgwick Avenue, between 161st and 162d Streets. The 162d Street connection joins the Ninth Avenue elevated line at Eighth Avenue and 157th Street, passes over the Putnam Bridge, and proceeds by tunnel under the hill to Jerome Avenue, where it connects with the Jerome Avenue line north of 162d Street. Stations will be at Sedgwick and Jerome Avenues.

Philadelphia, Pa.—Believing the bid too high, Director Twining of the Department of City Transit, Philadelphia, rejected on April 17 the only offer for the construction of the Frankford L station at Kensington Avenue and Huntingdon Street. The bid, which was for $58,753, was presented by the McClintic Marshall Company, which has the contract for building the track structure for that part of the line. Estimates of the engineers of the city had placed the cost of the station at about $40,000. The director will readvertise for bids.

Beaumont (Tex.) Traction Company.—This company will construct a new depot and express office at Port Arthur.

Houston, Gonzales & San Antonio Traction Company, Houston, Tex.—This company plans to erect a new passenger station, of brick and concrete construction, to cost about $100,000.

POWER HOUSES AND SUBSTATIONS

Chicago, Milwaukee & St. Paul Railroad, Chicago, Ill.—Announcement has been made by the Chicago, Milwaukee & St. Paul Railroad that power for main-line operation of its lines west of the Cascades will be furnished by the Puget Sound Traction, Light & Power Company, and will be generated at the Snoqualmie Falls plant. From Othello west, the company will use power purchased from the Washington Water Power Company of Spokane. Substations will be erected at Taunton, Doris, Kittitas, Cle Elum, Hyak, the east portal of the Snoqualmie tunnel, Cedar Falls, Black River Junction and the Tacoma shops and will cost about $175,000 each. Power will also be contracted for from the Intermountain Power Company, which will deliver 7500 hp. at Taunton from the Long Lake plant of the Washington Water Power Company, 15 miles west of Spokane.

Iowa Railway & Light Company, Cedar Rapids, Iowa.—Plans are being made for the installation of a large central station at Creighton, Neb., from which service will be supplied to Hartington, Bloomfield, Wakefield, Emerson and other towns in that section of the State.

Charleston Consolidated Railway & Lighting Company, Charleston, S. C.—About July 1 the Charleston Consolidated Railway & Lighting Company expects to have in operation the new substation equipped with three 750-kva. 2300/13,200-volt transformers; also three 400-kva. 2300/6600-volt transformers. In connection with this station the company will erect a three-phase, 60-cycle, 13,200-volt transmission line, 2 miles long, to connect with its present line at North Charleston, now 6600 volts, but to be changed to 13,200 volts. By the end of the year the company expects to have in operation in the power house an additional 528-hp. Franklin boiler.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

A Department for Buyers and Sellers

The need for a common meeting ground for the discussion of purchasing and manufacturing subjects brought about this department, "Manufactures and Markets." As a function of the service which this paper endeavors to render to the industry, this department is comparatively new. Therefore, the words of commendation of the efforts so far made have been received with especial appreciation. Constructive criticisms also are always welcome. Nothing is more helpful to an editor than a letter of comment from the field. It shows him, first, that his writings are being thoroughly read, and, second, shows him how best to guide his future efforts.

The purchasing agent of a large railway and power company in the South has pointed out that "until a few years ago the purchasing agent and his department were overlooked. He has been generally looked upon as a necessary evil, but now he is gaining recognition. I enjoy very much the articles published in your 'Manufactures and Markets' department. Any buyer should be deeply interested in everything published pertaining to market conditions and concerning the material and equipment he has to purchase." Then followed a page of good, helpful suggestions on topics which he said, if treated, would be of help to the "P. A." This case is mentioned as an example to others to give their comments also, whether favorable or unfavorable.

Insulators Should Be Purchased Long in Advance

Factories Hard Pressed to Make Deliveries—Orders Not Being Solicited Actively—Prices Advanced but More Stable

There is great need at the present time for buyers of insulators to let the manufacturers know just what their requirements are and what they are expected to be a year or eighteen months hence. This will enable the manufacturers to schedule their production and make deliveries in such a manner as best to serve the needs of the entire industry. The need for this course is especially important now because the factories have seldom if ever in their history been harder pushed to meet demands. While in the past there have been troubles with labor and difficulty in getting clay and metal parts, the ruling cause for the present congested condition in the pottery factories is that of unusual demand for insulators from all sections.

The true situation is perhaps best illustrated by the present method of handling insulator orders. For instance, a salesman gets an inquiry for insulators, say a small lot of even 200 of any type. He can quote the prevailing price on that particular style, but he will make no definite statements on when delivery can be made without instructions from the factory. Again, the factories have practically abolished or greatly curtailed their follow-up systems and are making little effort to get business if response does not follow when prices and deliveries are quoted. The impression should not prevail, however, that factories have adopted a stand of arrogance. They have not. This is shown by a recent incident wherein a syndicate property had to obtain 700 insulators of a particular type. After determining that it was absolutely necessary for the customer to have these insulators promptly, the manufacturer went over all of its orders for this type that were on file and wrote each customer asking if a delay in delivery of 700 insulators would cause inconvenience. As a result, one large company released enough insulators from its order to meet the immediate need of the other property.

The necessity of salesmen taking up orders with the factory is illustrated by another incident. A holding company wanted 3000 insulators of the small telephone type. Ordinarily these go through the factory in such great quantities that 3000 is a very small order to fill. The factory's reply to the inquiry stated, however, that there was none on hand and that delivery could be promised in ninety days. The reason for this long delay was that the machine for making this unit was shut down and conditions were such that it could not be started within sixty days.

The price of insulators has advanced sharply in the last few months, as was predicted in this department of the ELECTRIC RAILWAY JOURNAL for Nov. 11, 1916. Suspension units that formerly sold for 80 cents now are quoted at $1.30. The present tendency, however, seems to be for a stable price. There is thought to be little likelihood of the insulator plants being commandeered by the government on account of their inadaptability as munition factories. The demand for insulators is so acute, however, and the prospect for its continuance is so certain that there seems to be but one wise thing to do and that is for the electric railways to order insulators at least a year in advance of their actual needs.

Some Tips for the Stock Room and Storekeeper

How to Smooth Out the Friction in Ordering Repair Parts for Old Apparatus

A manufacturer of electrical apparatus and power plant machinery, who has commented on earlier articles in this department, in discussing the question of repair part stocks, has made some direct suggestions. He says, "If the railways would establish a minimum number of parts to keep on hand, if they would keep a record of disbursements and re-order when the minimum number of parts is reached without waiting for an actual call for the part from the shop or power house, conditions would be greatly bettered so far as the railway is concerned.

"We have had numerous instances where customers had become greatly annoyed because we could not make immediate shipment from stock of an obsolete part which was ordered for repair. If a customer would stop and think what it would mean for us to carry a complete stock of repair parts for all obsolete pieces of apparatus, as well as for all of the apparatus which is being regularly manufactured, we believe he would see how unreasonable it would be for him to expect us to do this, as it would mean that our inventory for such parts would amount to thousands of dollars and the depreciation on the parts would be considerable."

NON-STANDARD APPARATUS CAUSES THE DIFFICULTY

It is the practice of this manufacturer to discontinue carrying spare parts in stock when, after a reasonable period of time, usually about two years, no calls are made for the parts. Orders received after the discontinuance of carrying the parts, of course, have to take regular schedule through the shop, and this necessitates some delay even comparable with that for the delivery of new machinery. The question of how far a manufacturer is obligated to go in tying up capital in repair parts for obsolete machinery depends largely on the competition encountered in this class of business and whether it will be to the manufacturer's advantage to make up an excess stock in order to save money by manufacturing in quantities. Of course, these statements apply very largely to non-standard products.

Practically all manufacturers make it a plan to have reserve stocks of repair parts for all active and standardized products."

The engineering department of one large manufacturer writes that "An accurate record is kept as to disbursements of repair parts from the factory storeroom. This record indicates whether the parts are used for repairs or for new machines. On such parts as are kept in stock, we usually fix a minimum number of parts and when the minimum is reached the parts are re-ordered."

It seems safe to say that it is almost impossible for a manufacturer at all times to be prepared to meet unusual conditions and make prompt shipment of every repair part which customers are likely to require. Therefore, a great deal of responsibility rests with the railway storekeeper and purchasing department in giving the manufacturer advance notice of the probable requirements of the early future.

General Electric Report

1916 Orders for Electrical Machinery and Supplies Were 70 Per Cent Greater than Those in 1915

The condensed profit and loss statement of the General Electric Company, Schenectady, N. Y., for the twelve months ended Dec. 31, 1916, follows:

Sales billed	$134,242,290
Cost of good sold, including all operating maintenance and depreciation charges	118,948,199
Profit from sales billed	$15,294,091
Interest and discount	$1,539,499
Income from securities owned	1,844,645
Sundry revenue	482,738
Total	$3,866,882
	$19,160,973
Interest on debenture bonds	571,445
Available for dividends	$18,589,528
Dividends paid	8,121,646
Net surplus for the year	$10,467,882
Surplus on Jan. 1, 1916	23,692,871
Surplus on Dec. 31, 1916	$34,160,753

The annual report of the company states that the extraordinary demands for the various products of the company throughout 1916 made it necessary to operate its manufacturing and other facilities to the limit of their capacity. The value of orders received for electrical machinery and supplies was $167,169,058, or 70 per cent greater than the orders for electrical products in 1915, and 50 per cent greater than corresponding orders for the largest previous year, 1913. The orders for special war munitions received during the year, amounting to $2,416,000, were merely supplementary to previous contracts.

The company followed its customary practice in writing off against income its total expenditures during 1916 for patents, applications for and licenses under patents and other outlays relating thereto, amounting to $891,880. The patent account is carried at $1, as in previous years. Stocks, bonds and other securities are carried at a valuation of $33,773,678, of which $21,675,214 represents securities of subsidiary companies and $12,098,464 those of public utility and other companies. The current accounts and notes receivable are carried at $26,816,297.

Urgent pressure upon the management for immediate and extensive additions to manufacturing facilities involved the expenditure of $8,828,255 for plant account during 1916. This outlay, as compared to ordinary costs, was abnormal and excessive, in view of which it seemed wise to write off against income an amount substantially equal to the years' disbursement, or $8,486,822. The cost of all the special tools, jigs, dies, drawings and patterns was thus disposed of, as was also the greater part of the cost of the large machine tools and apparatus. The book value of building accessories covering additions for a period of years was also reduced. The book value of all plant on Dec. 31, 1916, was $29,904,764.

Quarterly dividends at the rate of 8 per cent per annum were paid during the year. The company has no note payable, and there is no paper outstanding bearing its indorsement.

Standard Sizes for Publications

BY J. C. MCQUISTON

Manager of Publicity Westinghouse Electric & Manufacturing Company

Everyone that keeps a reference collection of manufacturers' catalogs and other literature appreciates the desirability of having all these publications of a standard size. The difficulties involved in filing and referring to a mass of booklets of every conceivable shape and dimensions are almost unsurmountable, and as a result the usefulness of such a collection is very low.

Some years ago this company, in common with most manufacturing companies, issued publications in a variety of sizes. The following sizes, 3½ in. x 6 in., 6 in. x 9 in., 7 in. x 10 in., and 8½ in. x 11 in., were used mainly, but books of other dimensions were also issued whenever the particular text seemed to warrant a change. It became apparent, however, that this confusion of sizes was entirely wrong and that some standard must be selected and rigidly maintained. Everyone agreed to this principle, but the question then arose, what shall the standard be? Publications have different purposes. Some are intended to be kept permanently, others are intended merely to be read and thrown away. Some are designed to be sent out with correspondence, bills, and other mail matter; others are sent out by themselves over definite lists. Some are to be distributed by dealers and agents; others by the manufacturers' mailing division.

The problem is obviously a difficult one, and there are almost as many different solutions to it as there are individuals competent to pass judgment. Recommendations have been made from time to time by advertising clubs, purchasing organizations, and other bodies; but a collection of dummies made up according to these recommendations is the best of evidence that in a multitude of standards there is no salvation.

A publication 6 in. x 9 in. in size has much to commend it as a single standard for publications of all kinds, but after a careful consideration of the situation it became evident that, after all, there was one dominant standard size which is used by everyone and for which filing boxes, bookcases, cabinets, and every other office fixture could be obtained anywhere. This is the size of ordinary commercial letter paper, 8½ in. by 11 in. This size was finally adopted, and for the past several years the Westinghouse Company has been issuing practically all its new publications and is rapidly reprinting all of its old ones in this size. The gain to the users of these publications is unquestioned and many have expressed their appreciation of the change.

The size of 3½ in. x 6 in. is still retained, however, for publications that must be mailed out in small commercial envelops, as no other size is suitable for this purpose, and occasionally some publications are issued in other sizes for special reasons. But every Westinghouse publication that may possibly be filed is 8½ in. x 11 in., except card catalogs and instruction books, which relieves, as far as is in the power of this company, the collector's troubles.

How Important Is the Purchasing Agent?

"I have been in both operating and purchasing departments, and my experience has led me to believe that the chief executives of the electric railway companies generally look upon the purchasing department simply as a place for the keeping of records covering purchases made." These words. expressed by the purchasing agent of a large city and interurban railway system in the Central states, echo the thoughts of not a few other purchasing agents. The indictment, however, is not one which should generally be accepted, because there are examples on many roads of the purchasing departments rising above the earlier mentioned status, and then becoming a most important factor in the operating organization.

According to one man, "the purchasing agent is considered as sort of a chief clerk. Ordinarily he is given very little authority, and has to consult the management in regard to placing an order even after quotations are received. The real purchasing agent," our correspondent states, "is the general manager, and in many instances, when any important purchase is to be made, the general manager handles it direct, simply giving a record of the transaction to the purchasing agent so that a formal order may be made out for future reference and for checking prices when the invoice covering the purchase comes through."

The man who wrote the foregoing is plainly pessimistic, and that is a state of mind which, because of conditions during the last two years, may have been caused by a pressure of purely clerical work. The real job of the purchasing agent is to locate the best possible material, understand market and marketing conditions, understand the service which various materials may be expected to render, and be able to handle the sellers in such a way that he will obtain for his company the best available bargains and deliveries. The purchasing agent's position is one which should command deep respect, not only for his ability, but for his rank and function in a smooth-working railway organization. It is a position to be filled only by high-grade men. Only such men should be given the work, and they should be held responsible for the results.

FRICTION SHOULD BE AVOIDED

The purchasing department under the charge of a strong man should be one of the important departments of any large organization. To quote another purchasing agent of a large property, "it is true that the buyer places his orders on the recommendation of the engineering department, and according to specifications furnished him by that department, but the engineers have not the say as to what price is to be paid or where the material is to be bought, so long as the purchasing agent satisfies their requirements." Thus is the need for close co-operation between the purchasing and engineering departments clearly set forth. If they operate at cross-purposes, the property must lose either through the high cost for materials purchased, or from lower service value than that which might otherwise have been obtained.

The purchasing agent last quoted has the following to say about the relations of the purchasing department with the other parts of the railroad organization: "It is true that the buyer should depend upon the engineering organization to furnish him information and details governing purchases where such information is necessary, but when it comes to the question of price, the decision should be up to the buyer and the general manager. I think the buyer in his department should receive as much, if not more, consideration than some of the others, since he spends the company's money, and if given proper encouragement and co-operation can save still more. There are quite a number of concerns who fail to realize the importance of the purchasing department, and among this number are a great many railway and lighting companies."

To Report on Foreign Markets

Robert Grimshaw, special agent of the Department of Commerce, will leave early in June to visit the principal South American countries, at the instance of the Bureau of Foreign and Domestic Commerce, to investigate the markets there for certain lines of American manufacturers; also to report on the methods adopted in the different countries for getting bids and awarding contracts for governmental and municipal supplies, especially electrical. Before leaving for South America Mr. Grimshaw would like to learn from electrical and other manufacturers the principal difficulties that they have experienced in bidding on supplies in South America. He may be addressed at Room 409, Custom House, New York City.

William A. Russell, a prominent civil engineer, who was born and educated in Russia, will leave soon for that country as a trade commissioner representing the Bureau of Foreign and Domestic Commerce. Since Mr. Russell came to the United States, in 1907, he has assisted on the East River Tunnel construction, acted as an investigator for the Presidential Commission on the Isthmian Canal, and was expert consulting engineer for one year to the Board of Estimate and Apportionment of the City of New York. He was also a senior member of the organization of M. W. Thompson, and has acted in a consulting capacity for a number of companies on problems requiring the application of legal, financial and technical knowledge.

NEW YORK METAL MARKET PRICES

	March 31	April 21
Prime Lake, cents per lb	35	30½
Electrolytic, cents per lb	35½	30½
Copper wire base, cents per lb	42	39
Lead, cents per lb	9½	9⅔
Nickel, cents per lb	50	50
Spelter, cents per lb	10¾	9¾
Tin, straits, cents per lb	55⅞	55¼
Aluminum, 98 to 99 per cent, cents per lb	55	57

OLD METAL PRICES

	March 31	April 21
Heavy copper, cents per lb	29	27½
Red brass, light copper, cents per lb	24¾	24
Yellow brass, cents per lb	19	18½
Lead, heavy, cents per lb	8	7¾
Zinc, cents per lb	8	7½
Steel car axles, Chicago, per net ton	$38	$41
Iron car wheels, Chicago, per gross ton	$22	$24
Steel rail (scrap), Chicago, per gross ton	$27.50	$31
Steel rail (relaying), Chicago, per gross ton	$34	$39
Machine shop turnings, Chicago, per net ton	$9.50	$10.50

CURRENT PRICES FOR MATERIALS

	March 31	April 21
Rubber-covered wire base, New York, cents per lb.	42	39
No. 0000 feeder cable bare, New York, cents per lb.	42	39
No. 0000 feeder cable stranded, New York, cents per lb.	39¾	39½
No. 6 copper wire (insulated), New York, cents per lb.	39½	36½
No. 6 copper wire (bare), New York, cents per lb.	42	39
Rails, heavy O. H., Pittsburgh, per gross ton	$40	$40
Rails, heavy Bessemer, Pittsburgh, per gross ton	$38	$38
Wire nails, Pittsburgh, per 100 lb	$3.20	$3.20
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.65	$3.65
Steel bars, Pittsburgh, per 100 lb	$3.75	$3.75
Sheet iron black (24 gage), Pittsburgh, per 100 lb.	$4.85	$5.35
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$6.55	$6.55
I-beams over 15 in., Pittsburgh, cents per lb	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	4.05	4.05
Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.85	3.85
Cement (carload lots), New York, per bbl	$2.02	$2.12
Cement (carload lots), Chicago, per bbl	$2.06	$2.16
Cement (carload lots), Seattle, per bbl	$2.60	$2.60
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.11	$1.14
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.02	$1.15
White lead (100 lb. keg), New York, cents per lb.	10¼	10¼
Turpentine (bbl. lots), New York, cents per gal.	45	52

ROLLING STOCK

Mason City & Clear Lake Railroad, Mason City, Iowa, has sent out inquiries for three cars.

Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa, is making inquiry on fifteen cars.

Chicago (Ill.) Motor Bus Company has ordered 100 double-deck bus bodies from the St. Louis Car Company.

Ogden, Logan & Idaho Railway, Ogden, Utah, is asking for bids on 200 freight cars which are to be of standard design.

Pittsburgh (Pa.) Railways, noted in the April 7 issue as being in the market for 100 cars, has ordered fifty cars from the St. Louis Car Company.

Monongahela Valley Traction Company, Fairmont, W. Va., is reported to be considering the purchase of forty cars for its city and interurban lines.

Oklahoma City (Okla.) Railway has ordered six double-truck cars from the St. Louis Car Company and ten single-truck cars from the American Car Company.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., noted in the March 10 issue as being in the market for nine double-truck cars, has placed an order with the St. Louis Car Company for ten cars.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, noted in the March 31 issue as ordering twenty cars from the G. C. Kuhlman Company, has specified thirteen to be city and seven to be interurban cars.

Oklahoma Union Traction Company, Tulsa, Okla., noted in the March 31 issue of this paper as preparing specifications for seven one-man and three interurban cars, has placed an order with the American Car Company for nine cars.

Charleston-Dunbar Traction Company, Charleston, W. Va., has ordered two cars from The J. G. Brill Company.

City of Tacoma, Wash., through its City Council will soon be in the market for six motor and six trail cars for an extension to be built to one of the shipbuilding yards. The city will build the line and the Tacoma Railway & Power Company will operate it.

Stone & Webster Management Association, Boston, Mass., has ordered from the American Car Company 119 one-man cars with Safety Car Devices equipment, Westinghouse air brakes and the following specialties: Faraday high-voltage signal system, Hunter signs, Golden Glow headlights, Keystone rotary gongs, air sanders and trolley catchers. This includes the order for twenty-four cars noted in the March 31 issue.

Omaha & Council Bluffs Street Railway, Omaha, Neb., noted in last week's issue of this paper as having forty new semi-steel cars under construction, has decided upon the following details for this equipment:

Number of cars	40	Body	Semi-steel
Type of car	Rear ent. pass.	Control	K-35-G2
Seating capacity	45	Roof	Arch
Weight (total)	38,000 lb.	Motors	West. 506 C-2
Length over bumpers	45 ft.	Trucks	Brill No. 76 E
Width over all	8 ft. 4 in.	Wheels	30 in. cast

Interborough Rapid Transit Company, New York, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of March 10 as ordering 477 steel subway cars, has specified the following details for this equipment:

Number of cars ordered	477
Name of road	Interborough Rapid Transit Co.
Date of order	March 8, 1917
Delivery	Beginning October, 1917
Builder	Pullman Company
Type:	
Motor cars	337
Trail cars	140
Seating capacity	46
Weight (total):	
Motor car	75,000 lb.
Trail car	55,000 lb.
Bolster centers, length,	36 ft. 0. in.
Length over bumpers,	51 ft. ½ in.
Length over vestibule,	47 ft. 8 in.
Width over all	8 ft. 10 in.
Height over all	12 ft. 0 in.
Body	All steel frame
Interior trim	Steel
Headlining	3/16 in. Agasote
Roof	Monitor
Air brakes	Westinghouse
Axles	Not placed
Bumpers	Rico anti-climbers
Car trimmings	Not placed
Conduits and junction boxes,	G. E. and West.
Control type	Westinghouse
Couplers	Type J-1
Curtain fixtures	Not placed
Curtain material,	Double-coated pantasote
Designation signs	Not placed
Door operating mechanism,	National pneumatic
Gears and pinions,	G. E. and West.
Hand brakes	Pullman Company
Heaters	Not placed
Headlights,	Dresser Railway Lamp Works
Journal boxes,	Pullman Company
Motors	West. 577, R. I. and GE 260
Motors	Inside hung
Sash fixtures	Aero metal
Seats	Longitudinal
Seating material,	Upholstered, rattan
Springs	Elliptic and coil; Pittsburgh Spring & Steel Company
Step treads	Feralun
Trucks	Commonwealth Steel Company
Wheels:	Rolled steel; Trail 31¼ in. dia.; motor 34¼ in. dia.

TRADE NOTES

Vaughn & Meyer, Consulting Engineers, Milwaukee, Wis., announce a change of address after May 1 from the Majestic Building to the Security Building.

Page Woven Wire Fence Company, Monessen, Pa., is distributing an attractive booklet containing useful tables on Aristos Copperweld copper-clad steel wire.

Q & C Company, New York, N. Y., announces that it has opened a branch office in the Railway Exchange Building, St. Louis, Mo., under the direction of John L. Terry.

Horne Manufacturing Company, Brooklyn, N. Y., announces that it has received an order from the General Electric Company for 100 Lord screenless air cleaners.

Consolidated Car Heating Company, New York, N. Y., announces that on May 1 its offices in the Singer Building will be removed from present quarters on the thirty-first floor to suite 2610.

Peter Smith Heater Company, Detroit, Mich., announces that it has received an order from the International Railway Company for 365 forced-draft heaters to equip the present near-side cars and the 100 Peter Witt cars recently ordered.

Hess-Bright Manufacturing Company, Philadelphia, Pa., announces that C. H. Roberts, formerly factory accountant, has been appointed comptroller of the company.

Portland Cement Association, Chicago, Ill., has postponed indefinitely its spring meeting, which was to be held in San Francisco April 16 to 18, on account of international complications.

Poole Engineering & Machine Company, Baltimore, Md., announces that it has acquired the exclusive manufacture and selling rights of the turbo-gear formerly manufactured by the Turbo-Gear Company, Inc., of Baltimore.

Engelhardt W. Holst, whose resignation as mechanical engineer of the Bay State Street Railway was mentioned in the issue of this paper for April 7, has opened an office as general consulting and inspection engineer at 683 Atlantic Avenue, Boston, Mass.

Eccles & Smith Company, Inc., San Francisco, Cal., at a meeting of the board of directors elected Chris. Eccles president and manager and Charles F. Bulotti secretary. The Eccles & Smith Company have branch houses in Los Angeles, Cal., and Portland, Ore. The company deals in railway supplies, machine tools, pneumatic and electric tools, compressors, and all iron and steel products.

H. W. Johns-Manville Company, New York, N. Y., announces that J. D. Vale, former manager of the Salt Lake City office, has been appointed manager of the building materials department of the company's branch at Chicago. In the future the Salt Lake City office will be under the management of C. F. Cate. The Great Falls, Mont., office will be managed by J. H. Roe independently of the Salt Lake City.

Bridgeport Brass Company, Bridgeport, Conn., announces that it has acquired the Standard Brass & Copper Tube Company of New London, Conn. The factory of the latter concern, which was erected about eight years ago and has been devoted exclusively to drawing seamless brass and copper tube, has been increased in size three times in order to afford better delivery service to their customers on this class of product. The New London plant will be under the direct supervision of and operated as a branch of the Bridgeport works.

Safety Car Devices Company, St. Louis, Mo., announces the following recent sales of safety cars ordered completely equipped with this company's air brake and safety control equipment: Pacific Gas & Electric Company, Sacramento, Cal., four; Citizens Traction Company, Oil City, Pa., three; Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, two; Three Rivers Traction Company, Montreal, Canada, three; Tacoma Railway & Power Company, Tacoma, Wash., twenty-five; Puget Sound Traction, Light & Power Company, Seattle, Wash., fifty-four; Western Washington Power Company, twelve; Northern Texas Traction Company, Fort Worth, Tex., fifteen; Houston (Tex.) Electric Company, eighteen; Tampa (Fla.) Electric Company, twenty-two, and the El Paso (Tex.) Electric Company, ten.

ADVERTISING LITERATURE

Holophane Glass Company, Inc., New York, N. Y., has issued catalog No. 800 on its Holophane reflectors and fittings.

Northern White Cedar Association, Minneapolis, Minn., has issued a bulletin on the use of its poles for city and country transmission lines.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued Catalog 3A on its watt-hour meters. This bulletin supersedes division 9 of Catalog 3001.

Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y., is distributing bulletin No. 1009 containing correct price lists of telephone apparatus and materials.

Catalog Numbering System, San Francisco, Cal., has issued a descriptive bulletin on its system. Illustrations of index cards for catalogs, filing systems, etc., are given, and the use of this system is explained in detail.

Armstrong Cork Company, Pittsburgh, Pa., has issued a booklet on "Reducing Vibration and Noise," describing the use of Nonpareil cork machinery isolation for reducing noise and vibration of motors and machinery.

Westinghouse Air Brake Company, New York, N. Y., has issued its special publication No. 9021, on "Extra Quality Pipe Fittings for Railroad Air-Brake Service." This carefully prepared booklet emphasizes the better air-brake service and saving of money made possible by the use of reliable pipe fittings in all air-brake work on locomotives and cars.

Electric Railway Journal

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THE NEBULOUS 6-CENT FARE TAKING FORM

For many years electric railway men have talked about the 6-cent fare for city properties in somewhat the same way that mathematicians discuss the fourth dimension. It was of interest from a theoretical standpoint, problems based upon its use could be worked out mathematically, but it could not be visualized as actually in existence. We are glad to say now that the 6-cent fare is disappearing from the category of imaginary quantities. It is emerging from its nebulous form and becoming concrete. We had occasion only four weeks ago to commend the frank statement of President Brush of the Boston Elevated Railway to a legislative committee that the 6-cent fare must come as the ultimate solution of that city's transportation problem. In our issue of April 7 we published an abstract of a report on the Philadelphia situation in which the engineers of the city referred to a 6-cent fare on the proposed high-speed system as one way of reducing the deficit from its construction. Now the 6-cent fare is being talked of as a possibility in Albany as well as in Rochester.

A RETURN TO FORMER PRACTICE

A 6-cent fare for city service would simply mean a return to the fare charged by street railways for ten years or more beginning about 1864, when the rides were, of course, very much shorter than they are now. The conditions under which this fare was introduced about fifty years ago are described in a report presented at the 1911 convention of the American Electric Railway Association by Frank R. Ford. Briefly, they were permitted because of the higher cost for labor and material, and in March, 1865, Congress enacted a law giving legal status to the raising of the rates above the 5-cent fare provided in the charter of many of the companies. In many cases the fare was not reduced to 5 cents until after the roads were electrified. No serious difficulties were experienced in the collection of the 6-cent fare, and we do not believe that there would be any now, although fare collection methods have changed radically in the interval. The fact that in none of the cities where the plan has been broached has there been any serious outcry against the suggestion is at least some evidence that the public realizes that the high cost of living which has affected each individual is something from which railway companies are also not exempt. Undoubtedly there will be problems to be solved, but the 6-cent fare has at least been seriously suggested, and we hope that before long it will become an actuality in several cities.

DATA FOR ELECTRIFIED TRACK MAINTENANCE

The question of the effect of electrification upon track life and way maintenance is an important one. The factors entering the problem are many, and their comparative influences have been the subject of many disputes and much discussion. It is pretty well agreed, however, that the rail wear chargeable to the locomotive itself is considerable, and that well-designed electric locomotives with their distributed wheel loads, short rigid wheelbases, high adhesive coefficients, and absence of unbalanced reciprocating parts should cause much less damage to track structures than their competitors, the heavy modern steam locomotives. Unfortunately, there is a general lack of definite data relative to this claim. The results obtained on European roads are not conclusive, and few engineers would care to consider that the results obtained in this country in connection with interurban and rapid-transit lines and terminal electrifications are applicable to main-line conditions. Yet if it can be shown conclusively that with electric motive power even a small saving can be made in the annual cost of maintaining way and way structures, now grown extremely large, such a showing cannot help but have an important bearing on decisions relative to future electrifications. Now that several roads in this country are operating heavy main-line service over extensive electrified divisions, data on track maintenance ought to be available, and it is to be hoped that they will be obtained in the near future.

GOOD WATCHES ESSENTIAL FOR UNIFORM LOADING

In looking over a car-loading graph, it is usually taken for granted that every platform man had exact time. A recent investigation on a Southwestern city property, however, showed that a considerable part of the inequality in car loading was due to inaccurate watches. In the case of short-headway routes, it was found that an error of one minute in making time points might mean a difference of 33 per cent in loading. The trainmen were naturally astonished when told how influential such seemingly small variations could be, for they did not consider one or two minutes important. The use of car-checking instruments on this road is a further reason for seeing that the trainmen have correct time, inasmuch as the uniform making of time points is an essential factor in proper operation. While the management of this road feels keenly the need for better watches, it hesitates to put its men to the expense of buying movements which will meet the specification of less than thirty seconds variation in a week. It realizes that the cost of uniforms, supplies, etc., is quite a burden, especially for new men. Since this situation must be common to many properties, it might be well for some progressive watch manufacturer to appoint local agents who would be authorized to make especially easy terms to railway men. The railways themselves might also help by offering to pay part as reward for high efficiency in coasting, use of energy, freedom from accidents and the like. Certainly, if exact time can mean so much in railroading, the managements should be willing to do all they can to encourage the use of real railroad watches by their employees.

WHAT IS "SELLING TRANSPORTATION"?

Mr. Frothingham's paper at the 1917 mid-year meeting brought to the front the latest and most important question in the electric railway field—that of "selling transportation." As from now on we shall hear a great deal on this topic, it is well that there should be a fairly definite understanding of what this term means.

One school has defined "selling transportation" as selling the railway's viewpoint through liberal publicity, courtesy and prompt attention to complaints. It would also endeavor to cultivate salesmanship among trainmen by having them pay more attention to the needs of passengers and even to acquiring a speaking acquaintance with riders such as exist between a store clerk and frequent customers.

To another school, "selling transportation" means largely the selling of the greatest possible number of rides. Less stress is placed upon extensive publicity than upon giving a service that the public cannot overlook. The modern one-man car is the strongest weapon of this school, and most effective use is being made of it.

To us, "selling transportation" means a blend of both views. We do not believe that the most persuasive and pervasive publicity will do a railway any permanent good if it does not back up its expressions with accomplishments; nor do we believe that a betterment of service made almost *sub rosa* is going to get enough extra business to justify the outlay.

When all is said and done, the public can be sold only on good service well advertised, and with a definite personality behind the service. The public has too many troubles of its own to harbor resentment long once the causes have been removed. Two or three years of well-advertised good service have, in more than one community, changed active hostility first to indifference and then to support—yea, even to home financing of the local utility's needs. The merchant who acquires a run-down or bankrupt store does not argue with customers as to who was responsible for past wrongs. He simply begins anew as if nothing had ever happened. Let the live electric railway man follow his example. He should quit apologizing for his predecessors and buckle down to the job of selling transportation by making his railway a credit to the town both in its service and in its publicity.

CONSERVATION IS NOT NECESSARILY RETRENCHMENT

There is great confusion in the minds of many people as to what they should do now that war is here. Like Mr. Britling, they feel they want to aid the government in some way but do not know what that way should be. As the present conditions are not greatly different from those which prevailed in England during August, 1914, it might be well to consider first the warning issued on April 19 by Howard E. Coffin, a member of the advisory committee of the Council of National Defense, as to some of the things not to do. In this interview, Mr. Coffin pleaded against a fitful and ill-advised campaign of public and private economy. Briefly, his thought was that while we want to reduce waste, especially of food and of the raw materials which will be directly useful to ourselves and to our allies in the prosecution of the war, we need quite as much to be sure that general business conditions shall remain as nearly normal as possible. In other words, in the mobilization of our military strength and industries, we must mobilize as well all of the commercial energies of the country so as to make each unit as productive and efficient as we can. To quote Mr. Coffin: "The country must keep going strongly ahead as a successful economic machine. We must have successful industries, if successful tax levies are to be received."

To this statement there will be general agreement, but what is its application to the electric railway industry? As we see it, the application is this: The electric railways of the country are a vital factor of both our military defense and our industrial activity, especially when the latter is under high pressure conditions. British experience has shown that during war a considerable additional traffic should be expected on the local railways. This will come partly as relief to the main lines, to which naturally will fall the long-distance haulage of men and supplies, and partly because of the greater need of transportation by the workers in the industrial army and others who remain at home. The first duty of the electric railways, therefore, in any scheme of national defense, is to maintain their properties in such condition of maximum efficiency that they will be able to supply all transportation of a military and civil character that may be demanded. This obligation naturally includes that of co-operating with the military authorities in the extension of their transportation facilities, where necessary, to care for more rapid movements, and in other ways already detailed in these pages.

A secondary duty, subordinate only to the first, is that of carrying on this work with the greatest efficiency and with the least waste. This means a conservation in the operation of each property of the physical equipment, the labor employed and the administrative and executive talent exercised. If this conservation can best be secured by the expenditure of money (and real conservation often means expenditure rather than retrenchment), money should be spent more liberally than ever before. It should be spent intelligently, however, so as not to interfere any more than is necessary with the needs of other industries or of the nation as a whole. This logically suggests that the economies sought should primarily be those secured by labor-saving devices or methods, or in reducing the consumption of raw materials useful in commerce or in a military way.

We have no doubt that the electric railways will respond promptly and patriotically to the needs of the nation. This country is being drawn together as never before. Its people realize that the fundamental point at issue in the present war with Germany is not infringement of our international rights at sea, no matter how outrageous those infringements may have been. But a great moral issue is involved. Shall the weak be constantly in danger of the imperialistic ambition of their stronger neighbors? Shall all nations be subject to repetition of the present war when one country feels that it has the military power to conquer another? Shall the future government of the civilized world be autocratic or democratic? Americans with their traditions of liberty can answer these questions in only one way.

CHARGES FOR UTILITY MANAGEMENT

The decision of the Illinois commission in the Lincoln Water & Light Company case, mentioned in our last issue, and the order issued last December by the Massachusetts Gas & Electric Light Commission on the award of contracts, abstracted at the time in these columns, are important because of their bearing upon the subject of the relations between holding companies and their subsidiaries. By the Massachusetts order, which was addressed "to the several companies under the supervision of the board," it will be remembered, all utilities are forbidden to contract for supplies, construction or management with concerns in which the utility's officers or directors have a substantial interest, except where such concerns secure the contract on the basis of the most favorable offer, to be ascertained by "honestly conducted competitive bidding." Exceptions to this general rule are to be made only under unusual circumstances and with the approval of the board. Existing contracts shall not be renewed upon expiration except upon the terms prescribed.

Without doubt, instances may be found of the abuse of power by holding companies over their subsidiaries. Perhaps the order of the Massachusetts board was prompted by some case of the flagrant misuse of such authority, although none was mentioned. It is a self-evident duty of every public utility commission to protect the customers of public service corporations from such abuses. We believe, however, that in carrying out any policy looking to the divorcing of the management and the ownership of a utility, a commission should exercise the greatest care to avoid doing permanent injury to the utility and its patrons. Competitive bidding for expert management would bring into competition the successful, experienced firm and the amateur organization. The latter could well afford to assume such responsibility for little or no compensation because of the experience to be gained and the opportunity to establish a reputation. The older organization could not afford to take unprofitable work. It would have the handicap of high salaries for men of wide experience and long training. Its bid, by comparison, might seem excessive if the award were to be determined solely by the charge paid.

We have, however, no serious fear that so revolutionary a change in the management of our utilities is about to take place. The present practice of having the owners operate their own property is not only the most logical from the standpoint of the stockholder but it should be best for the patrons because it should encourage a broad policy of building up the undertaking. The cases cited are warnings, however, that commissions in future rate cases will give more attention than they have in the past to the charges made for management by holding companies and to the benefits derived under such management by the local utility involved.

ONE-MAN CARS SHOULD MEAN BETTER SERVICE

There has been some talk about the desirability of avoiding the term "one-man" car because of its effect on the public. There is equal danger, in our opinion, that some railway managers will become confused by the term and will come to look upon this valuable type of car simply as a means for cutting the labor cost in half. The one-man car in itself is not a Moses in the wilderness, loaded down with manna for starved receipts; nor is it a sure-cure physician for swollen expenses. If one were to judge by what some managers say, he would think they believe that the adoption of one-man operation simply means closing the rear platform of their present cars and discharging half of their platform men. Any company which attempted this would be undeceived in twenty-four hours; indeed, such a trial might lead to prohibitory legislation throughout an entire State.

There is just one right way to introduce the one-man car on anything but a thinly-patronized line, and that is to increase the service proportionately when the change is made. It is also desirable, when possible, to install entirely new cars.

Do people prefer five-minute to ten-minute headways, and seven-and-a-half-minute to fifteen-minute headways? They do, and they are showing it by 10 to 15 per cent greater riding. Do the platform men prefer the all-automatic car, more pay, and undivided car management? They do, judging by their unwillingness to return to the old plan on other routes. Are the railways who bought new cars earning their rewards in lower costs of operation and maintenance? They are, to the extent of seeing undreamed-of possibilities in the new method of operation in the threefold aspect of better earnings, satisfied employees, and improved relations with the public.

Therefore, let every railroad man do all he can to prevent jeopardizing the wonderful good that can come from handling the one-man car in the right way, not as a bald scheme for reducing the number of platform men but as a splendid means for regaining or actually creating traffic through the provision of better, safer, and faster service.

Instructions for Inspecting Bridges and Culverts

Thorough Inspections, Supplemented by Use of Work Sheets Outlining Annual Improvements, Reduce Emergency Repairs to Minimum

By FRANK B. WALKER

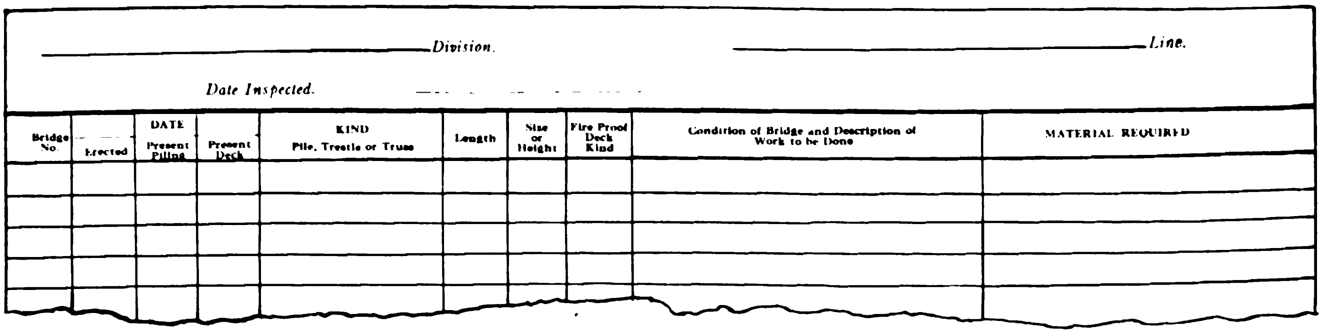
Engineer in Charge of Bridges and Grade Elimination Bay State Street Railway, Boston, Mass.

OF the various articles and letters published during the past few years in the ELECTRIC RAILWAY JOURNAL on the subject of bridge and culvert inspection, the writer wishes especially to commend the editorial which appeared in the issue for April 19, 1913, page 706. This editorial showed clearly that safety of operation and continuity of service depend upon rigid periodical inspections. It included specific suggestions as to the methods to be used in inspections and in recording the results thereof. The present article takes up these important subjects in greater detail with a condensed set of instructions of an extremely practical character.

IMPORTANCE OF REGULAR INSPECTIONS

The proper inspection of bridges and culverts is one of the most important duties of the maintenance of way departments of both steam and electric railways. Bridges on steam lines are, with but few exceptions, owned and maintained by the operating companies, while on electric railways, particularly street railways, the major portion of the bridges are owned and maintained by the cities, towns, counties or interests other than the operating companies. However, a greater amount of inspection work falls upon the maintenance of way engineer than the total amount of the company's capital invested in bridges indicates, as all structures over which cars operate must be thoroughly inspected at stated periods whether the operating company owns them or not.

Several years ago the writer, when connected with the engineering department of a transcontinental railroad, had occasion to inspect and supervise the maintenance of all bridges and culverts on many thousands of miles of line, and also to instruct others in the best ways of making the necessary inspections. The instructions given below are a result of that experience. I have found that they apply equally well to the inspection of electric railway bridges.



______________________ Division. ______________________ Line.

Date Inspected. ______________

Bridge No.	DATE			KIND	Length	Size or Height	Fire Proof Deck Kind	Condition of Bridge and Description of Work to be Done	MATERIAL REQUIRED
	Erected	Present Piling	Present Deck	Pile, Trestle or Truss					

SPECIMEN PAGE OF BRIDGE INSPECTION BOOK USED ON BAY STATE STREET RAILWAY

These instructions were printed on the front fly leaves of all of our bridge inspection books. After the fall inspection was completed the notes were checked over by the resident engineer, and a decision was made, after consultation with higher officials, as to the permanent work or betterments that would be authorized. Work sheets, setting forth the nature of the work for each structure, were then prepared, bills of material were made, requisitions were sent to the stores and purchasing agent, and all other arrangements were completed in the late fall or early winter so that bridge work could be started promptly in the spring and carried out continuously during the working season. In normal years contracts for masonry, filling or other work can be let at lower prices if bids are requested in the fall or winter, as all materials are cheaper during the slack winter season. It is astonishing how little emergency work on bridges is necessary when the inspection is properly made and when the work of repairs is closely followed by frequently checking up the bridge work sheets.

INSTRUCTIONS TO GOVERN INSPECTIONS

1. Master carpenters should make a thorough inspection of every bridge and culvert on their divisions each spring and fall, and should be held responsible for their safe condition. Should any structure be found to require immediate repairs, the work must be done at once, and a full report made to the division superintendent and resident engineer.

2. The resident engineer should make work sheets from fall inspection notes, showing the work to be done and material required.

3. The spring inspection should show whether or not the work outlined on the work sheets is sufficient to keep the structures in safe condition until the following spring. If more work or material is required than the work sheets show, the additional work or material required should be fully specified. A copy of these inspection notes must be made and forwarded to the resident engineer and reported by him to the chief engineer for approval.

4. The fall inspection should be made jointly by an assistant engineer and a master carpenter. They should both inspect thoroughly every bridge and culvert, entering in their inspection books complete notes, including bills of material required and a statement of the work to be carried out during the ensuing year.

5. All bridges and culverts should be inspected on main lines and sidings, at highway crossings and overhead railway and highway bridges which the company maintains or over which it operates. It should be indicated who maintains other overhead bridges. The length and height of each structure should be noted, giving those of each part separately, such as approaches, trusses, timber, steel, etc. The height of bridges should be taken from the lowest ground surface to the base of the rail. The length of timber culverts should be taken as the length of the lower timber. Masonry culverts should be measured for length between the outer faces of parapet walls. In rectangular culverts the height should be given first and the width second. The length and width of overhead bridges should be given, and also the overhead and lateral clearance of each track.

The kind of each structure should be given, *i.e.*, whether pile or timber, truss or girder bridge, plank, timber, stone, concrete, stone arch, brick arch, iron, sewer, reinforced concrete, corrugated-iron pipe culvert, etc., as the case may be. The names of streams spanned should be given, and stations, mile posts, and overhead bridges should be entered between the proper bridge numbers. Panels, spans or bents should be numbered, say, from east to west with No. 1 at the east end.

Galway Line Western Division 49 Sheets
Statement of Work to be done on Bridges & Culverts During 1914 Sheet No. 2

Bridge & Culvert Numbers	Kind	Lg'th.	Ht.	Work to be done	Approx. Cu. Yd.				Ln. Ft. Brs. to be Fl'd	Lin. Ft. of Pipe Required							Number			Date Completed
					Exc.	Filling	Mas'nry	Rip-rap		Kind	12"	18"	24"	30"	36"		Tim. Bill	A.F.E.	Item	
25	Pile	11½	3½	Piles and deck poor. Replace with 36 in. concrete pipe 32 ft. long, fill and place one metal number plate.		30		8	12	Concrete Pipe					32				21	

SAMPLE WORK SHEET WITH AN ITEM INDICATING NEEDED REPAIRS

6. If a structure requires no repairs for one year it should be marked "O.K." in the column "Condition of Bridge." When structures require repairs or renewals within one year, a concise statement should be given of the conditions of various parts upon which work is needed, as piles, trestle bents, sills, caps, stringers, ties and guard rails, fireproof decking, etc.

7. The current year's work sheets should be checked up to see if the work specified thereon has been properly completed. If any additional work is required it should be so stated and a list of necessary material specified.

8. New bridges or culverts constructed since the last inspection should be recorded in the proper places and their exact locations given.

9. Bridges or culverts needed to provide additional waterways should be recommended and notes given on the character of the work, the approximate drainage area, why needed, etc.

10. The bridge records should be kept up to date in a separate book. They should give the number of piles in each bent, length of spans, number and size of stringers, length of trusses or girders, height of each bent, pier or abutment, etc.

11. The condition of piles or timber bents should determine the renewal of decks. For bridges with decks in fair condition and piles above ground in poor condition, it should be determined whether frame bents cannot be substituted for piles. The cheapest construction consistent with safety and future repairs or renewals should be adopted.

12. The following information should be given regarding structures which have about reached their limit of life: (a) Material required to repair. (b) Material required to renew complete with similar construction. (c) Permanent work required, and whether of steel, masonry, pipe or filling, or a combination. The approximate yardage of filling and masonry should be given and the size and length of steel or pipe. High-water marks should be observed and in so far as possible conclusions drawn as to the kind of foundations or if further investigation is necessary. If the size of the permanent opening required is doubtful, further investigation should be recommended before the permanent work is ordered. If an opening is to be filled, the inspector should note whether it is used for a roadway or a cattle pass, giving the size and location of the opening to be left in the permanent structure. When pipe culverts are recommended, the height of fill should be noted, and also whether pipe can be put through the present opening or if excavation will have to be made from the top or by tunneling through the fill.

13. Data on highway crossing culverts, giving their location, length, size, kind of material, distance from the bottom of ditch to the top of the road, and on which side of the track, should be recorded in separate books. Minor repairs can be made with second-hand timber. If the culvert is to be completely renewed, the area of the required opening should be stated.

14. The size and kind of ties on steel bridges should be noted, and also whether they are creosoted or painted, whether the rails are cutting into the ties, the number and kind of tie plates, if any, and the kind of rail joints, if other than angle-bar pattern. A small percentage of renewal ties for steel bridges should be of the same size as those in use at the time, but when the major number of all of the ties are to be renewed, they should be of standard sizes, surfaced on four sides and painted. The inspector should also note the condition of wood fillers under the ties.

15. If bridges have inside guard rails the kinds and conditions of these should be noted as well as their height with respect to the track rail. The inspector should notice if the points are in place, and whether or not repairs or renewals are required.

16. The alignment and surface of the track on bridges and approaches should be noted, whether it is tangent or curved and if properly centered on the bridge. Track on approaches should be in good surface and firmly bedded to avoid any undue shock when trains come onto the bridge at a high rate of speed. If the track is creeping on the bridge, the direction and the amount of movement should be ascertained.

17. The kind and condition of fireproof decking on all bridges should be noted.

18. Piles should be inspected below the ground surface as well as above. If they sound hollow, a hole should be bored to determine the thickness of the shell, and the kind of wood if the piles have been treated.

19. Trestle bents or towers should be properly sway-braced, and all braces, longitudinal and lateral, should

be drawn up tight and should have sufficient bolts or spikes to hold them properly. They should stand plumb and be otherwise in good condition.

20. The amount of camber in each truss should be noted. Timber truss spans with spliced tension chords should be thoroughly examined for pulling, which would indicate weakness due, perhaps, to a defective clamp.

21. Truss rods should be taut and in uniform tension, and all nuts should be screwed on just far enough to maintain a full grip on the screw ends. Howe truss rods are provided with about 6 in. of thread.

22. Broken angle blocks should be noted, and also the location of the break and the distances the pieces have spread apart. Any crushing of lugs into the timber should be observed, and also the inspectors should note whether braces bear squarely on angle blocks or whether they are working.

23. The condition of jib plates should be noted, as well as crushing of jib plates into the chord. Lateral systems should be examined for tautness and to insure all members being in place.

24. In the case of a steel bridge the date when it was last painted and the brand of paint used should be recorded and, from its condition and the percentage from which paint has scaled, it can be determined whether it should be spot or full painted.

25. The accumulation of dirt or débris on the bridge should be noted, especially on steel members or the masonry.

26. The bridge and vicinity should be cleared of all inflammable material.

27. The boxes at the bases of steel columns and other places which would hold water should be examined to see that they are filled with concrete, or other protection provided.

28. Steel bridges should be examined to see that they have sufficient room for expansion and contraction at the ends, and if they do not the reason should be ascertained. If the bridge is on rollers they should be in proper adjustment, and if pin connection is used the nuts should be secure on the pins.

29. If the paint has cracked or if rust has formed around rivet heads, the rivets should be examined, as this condition is an indication of loose rivets. Special attention should be given to stringer rivets, since it is most likely that the top rivets in these connections will be loose.

30. In truss spans, especially those of light design, the action under train loads should be noted and, in case of undue deflection on swaying, arrangements must be made to take accurate measurements. Adjustable counter-rods must not be allowed to hang loosely and must not be tightened more than just enough to secure a good bearing with no train on the bridge. When tension members are in multiple, they should be equally strained.

31. Details of machinery, including latches, rail lifts, rollers, etc., on all drawbridges should be examined, and the drawtender consulted about any defects he may have noted.

32. Piers and abutments should be examined carefully for signs of yielding, either by settling, or by cracking or bulging under earth pressure, and the location of cracks, by means of a sketch, should be given together with suggestions as to their probable causes. The condition of pointing should also be noted. Bridge seats and capstones should be examined for cracks or evidence of crushing.

33. The inspector should note whether there is evidence of scour around foundations, recommending any additional work, riprap or other materials if needed, and whether there is an accumulation of drift or other obstruction in the channel which should be removed or if the channel should be straightened.

34. It should also be noted whether any repairs are needed for timber cribs, wing dams, ice breakers, shear dams or other miscellaneous structures in connection with the bridges around river or stream channels.

35. Water barrels should be examined to insure good condition and location on all wooden bridges. All bridges should have proper bridge number boards, and Howe trusses should have ladders.

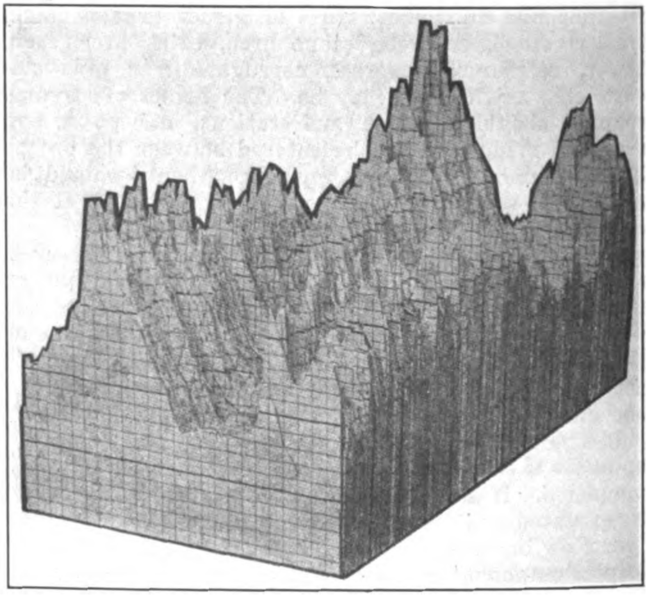
36. When tracks are on highway bridges the kind and condition of pavement should be noted.

37. Record should be made of speed-limit or other restriction signs on bridges or approaches.

38. When any portions of the structures are subject to smoke blast from locomotives, careful and thorough inspection of such portions must be made by using calipers to determine the net sections of the iron or steel and the amount of corrosion, if any. To inspect chords and floor beams, portions of timber floor must be removed when necessary.

Stereotomic Representation of Power Plant Load

The presentation of data in relief has long been found effective in many fields where it has been desirable to show the inter-relation of three variables. The application of this plan to power-plant loads is comparatively recent. There is, however, no more practical way of showing the changes in magnitude and character of load than that shown in the illustration reproduced from the March 31 *Revue Générale de l'Electricité*. It depicts the 1916 load of the Société Hydro-Électrique des Basses-Pyrénées, which has a promising power development in the extreme southwest corner of France.



REPRESENTATION IN RELIEF OF POWER PLANT LOAD

The model is made by mounting the load charts on thin sheets of cardboard or wood, sawing along the graphs and stacking the sheets as shown.

Tuesday, Oct. 9, has been selected as Fire and Accident Prevention Day. Preparations for a suitable celebration are under way by the safety and insurance interests. The National Safety Council, 208 South LaSalle Street, Chicago, Ill., will welcome suggestions as to the most effective means for eliminating accident risks.

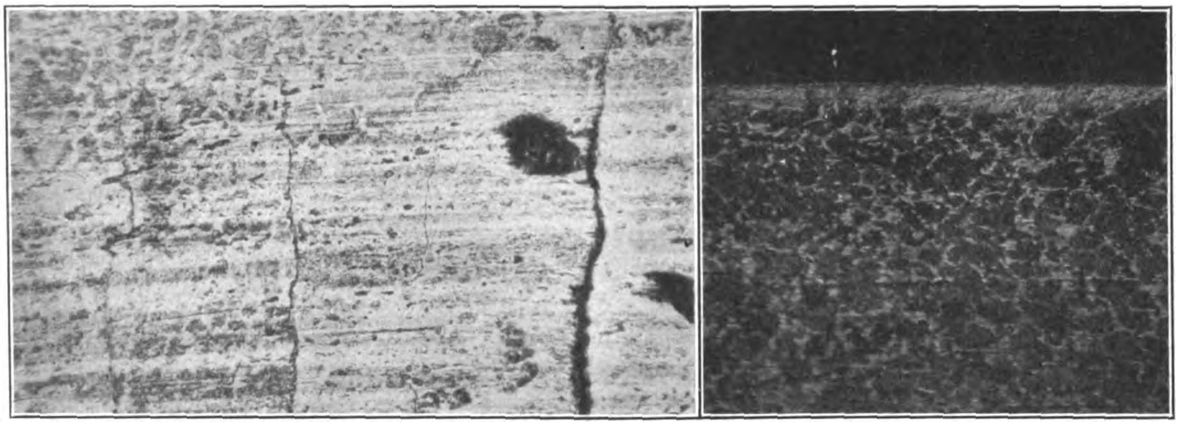
Reducing Load vs. Raising Yield Point as Rail Corrugation Cure

Periodic Cracking and Buckling of the Stretched Skin Observed in Microscopic Study—Alternate Rolling and Abrasion Is Not Vibration

By HENRY M. SAYERS, M. I. E. E.
London, England

ON page 8 of the ELECTRIC RAILWAY JOURNAL for Jan. 6, 1917, a review of the present position of the corrugation question states: "A microscopic analysis of the mechanical properties of a corrugated rail by H. M. Sayers revealed nothing new in the way of remedy." The writer has no complaint to make of that comment; the paper was intended to be a statement of what the microscope revealed, and it was hoped that it would lead to a useful discussion and perhaps some suggestions. This hope was not fulfilled. The study* to which you referred, however, did leave on my mind some very definite views both as to the root cause of the trouble, and the direction in which cure or prevention may be found.

The sentence following the foregoing quotation states: "Perhaps the vibration theory is still held by the largest number of people, but the remedies based upon this theory, where they have been used, have failed to cure the disease." The writer, however, believes that the pseudo-regularity of rail corrugations, which naturally suggested the vibration theory, has been a "red herring"; it has set people to tracing and trying all kinds of ideas based upon the vibration of something, from the rail-rolling plant to torsional vibrations of axles, but nothing has resulted from these many lines of investigation, so that in the face of such an accumulation of negative results, the conclusion is that the vibration theory is not proved, and holds out no prospect of cure or prevention.



RAIL CORRUGATION—FIG. 1—MICROPHOTOGRAPH OF AMORPHOUS SURFACE CROSSED BY CRACKS; FIG. 2—MICROPHOTOGRAPH OF LONGITUDINAL SECTION OF RAIL AT CREST OF CORRUGATION, SHOWING THIN AMORPHOUS LAYER OVER NORMAL STRUCTURE OF METAL. MAGNIFICATION IN BOTH FIGURES, 110 DIAMETERS

METALLOGRAPHICAL CONDITION OF CORRUGATED RAILS

The microscopic study, the results of which were set out in the article and illustrations previously referred to, does at least show what the metallographical condition of a corrugated rail is, and lends itself to our interpretation, which finds support from other sources, of the causes of that condition.

The micro-photographs of the table of a corrugated rail show that on the crests the steel has a smooth structureless appearance crossed by cracks, while in the hollows the normal structure of pearlitic steel is shown. Fig. 1, which pictures the surface of the rail table at the boundry between a crest and a hollow, shows all these features distinctly, although the low magnification of 110 diameters, essential to showing a sufficiently large field, does not bring out the detail of the pearlitic structure. Fig. 2, which is a longitudinal section at a crest, shows that the amorphous or structureless metal has a small but sensible thickness overlaying the normal ferrite-pearlite metal.

The amorphous condition must be the result of something which has happened in the course of service, producing an obvious difference of structure. What that something is ought to be the answer to the question: What is the cause of corrugation? The author would say that a great deal of light is thrown on the subject by certain facts relating to the behavior of manganese steel, which are very clearly stated by Sir Robert Hadfield in an appendix to the "Report of the Hardness Tests Research Committee" of the British Institution of Mechanical Engineers, published in November, 1916. Defining "hardness" as simply "resistance to deformation," Sir Robert says: "According to this criterion manganese steel is of a soft nature. Its yield point is low, a very small load producing permanent deformation. From this standpoint manganese steel, unless its character is altered by deformation, is really soft, yet in the ordinary acceptance of the term this material is considered very hard. Why is this? The explanation is that the ordinary term involves a loose conception of more or less (no definite amount) of deformation, and the 'hardness' is that of the more or less deformed material. Manganese steel is an extremely hard wearing material, in spite of its natural softness, because the act of abrasion deforms the material locally, its resistance to further deformation increasing enormously thereby, and the material actually abraded off is not manganese steel in its natural state, but is the quite different material, deformed manganese steel. Manganese steel is soft, deformed manganese steel is hard."

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*See ELECTRIC RAILWAY JOURNAL, April 22, 1916, page 786.

PERIODIC CRACKING AND BUCKLING OF THE STRETCHED SKIN

The material called manganese steel in this quotation is not exactly defined, but from the particulars given in the body of the report, it seems that it is steel containing about 13 per cent of manganese, which is, of course, very much more than is found in ordinary rail steel. Nevertheless, it may be suggested that ordinary rail steel partakes to some extent of this quality, and in the tests reported by the research committee, it is shown that ordinary steels under rolling wear suffer a surface change which is indicated by an increased surface hardness of from 4 to 15 per cent, as measured by the scleroscope, against an increase of about 100 per cent for the manganese steel. This supports the aforemade suggestion that the difference between the behavior of rail steel and manganese steel under rolling wear is one of degree only. The report of the committee describes what takes place as follows: "It may be assumed that, on first putting on the load, the yield-point of the material of the specimen on an extremely narrow strip of the surface of contact is exceeded, and that slight deformation takes place depending on the radius of the wearing and the amount of the load. After a few revolutions, therefore, there will be a thin ring of material around the specimen which has been permanently strained, and whose resistance to deformation is greater than that of the original material. Wear will then begin to take place by the gradual disintegration of this ring, both under the repeated loadings and under the extremely small but definite elastic slipping of the surfaces over each other, which is the well-known characteristic of rolling."

Now apply this to the case of a rail. With the axle weights and wheel diameters now in vogue, it is clear that the compressive stress on the rail table attains very high values amounting to approximately 50 tons per square inch in some cases where it has been measured by somewhat approximate methods, this value being considerably in excess of the yield point of the unaltered material. The result is the production of a skin of deformed metal, which has a higher hardness number, and a greater resistance to rolling wear than in its original condition. This altered or deformed skin is what is shown by the microscopic analysis of the "crests" of the corrugations. That at least is the interpretation submitted by the writer. The deformation, however, is not confined to the minute or interval structure. There is a distinct lateral flow or extension of the surface metal, as is clearly shown by protrusion on the sides of the table, both on the gage side and the outside of the rail. There must be a tendency to longitudinal stretching also, resisted by the cohesion of the metal and resulting in periodic cracking and buckling of the stretched skin. This initial cracking is clearly shown in the photograph, Fig. 1, and the writer would say that this phenomenon does not appear to have been observed, or at least published by any other investigator.

The report of the research committee states that "Another characteristic of the test is that part of the material worn away during the progress of the test appeared to be rolled into the surface again and finally came away in flakes." That the cracked and buckled deformed skin comes away from the rail is made clear by the writer's examination, the normal structured hollow being an evidence of it. Given a fairly uniform initial extension of the surface by the rolling action of the wheels, a periodic occurrence of the flaking off seems natural. The "pitch" of this flaking is probably determined by the mechanical constants of the steel and the severity of the rolling action, leading to a breaking up under a kind of shearing action, between the stretched skin and the unaffected body of metal below.

It is therefore suggested that the crests of corrugations consist of deformed, hardened and stretched steel, and the hollows of unaltered steel from which the hardened material has flaked away. Now the points at which flaking commences may very well be determined in part by such disturbance to smooth rolling of the wheel as derive from joints. The position of ties, etc., and the sometimes fairly regular sequence of joints and corrugation patterns suggests this. Another cause of the pseudo-regular pitch may be due to alternating skid and rolling of the wheels, the skid producing abrasive wear (on the hollows) and the rolling confirming the hardening of the skin. This is suggested by the frequent appearance of corrugations on track of moderate curvature, where there must be some alternating wheel action, and also by its constant appearance at places where braking is frequent. This has been especially noticed at "optional" stopping places on British tramways, where braking at short notice is frequent. There, the alternating action is no doubt that of rolling and skidding, whereas on the long radius curve it is alternately rolling and slipping. Slipping and skidding are equivalent in this respect, and it is noteworthy that against such abrasive actions the deformed steel was not found to show any superiority to the unchanged metal in the tests of the previously mentioned committee.

This alternation of rolling and abrasion is, in the writer's opinion, the only form in which the "vibration" theory comes into the matter at all, and it is not, he suggests, properly named as vibration.

REDUCING LOAD VS. RAISING YIELD POINT

The question remains of cure or prevention. The formation of a skin of deformed steel presenting a greater resistance to rolling wear than the unaltered metal is clearly not a defect, but a good point in rails. But the mechanical extension or detrusion which accompanies it under present conditions is just as clearly an evil, and is the root of the trouble. It occurs because the specific load put on the material is much in excess of its yield point. The cure, therefore, is to arrange either that the load shall be reduced or that the steel of the rails shall have a higher yield point, *i.e.*, that the initial hardness shall be increased.

Taking the first item, it does not seem possible to reduce the axle loads on electric railway vehicles. The tendency, both in the United States and Europe, has been for cars to become heavier. It has been noted, however, that in the United States there has been a considerable revulsion toward the use of lighter cars, chiefly motived by consideration of the traffic conditions (such as jitney competition) and partly by desire to reduce the cost of operation. But the loading of the rail surface depends not alone on the axle loads but also on the size of the wheels. Larger wheels mean a larger contact area, and therefore smaller specific load than smaller wheels, for the same axle load. It seems therefore that the tendency to use 24-in. and 26-in. wheels which has been in evidence in the United States lately may be expected to increase corrugation, unless the axle loads are proportionately decreased. It may be mentioned that in the United Kingdom the commonest size of tramway wheel is 30 in., but many "maximum traction" trucks have driving wheels of 33 in. With such trucks it has been found that the specific load put on to the rails by the smaller (20-in. to 24-in.) pony wheels is greater than that due to the drivers, *i.e.*, the smaller diameter more than neutralizes the lower axle load.

There remains the question of rail hardness or resistance to mechanical deformation under a rolling load. The most obvious way of increasing hardness is to increase the carbon content, which has been done to a considerable extent on British tramways, 0.6 per cent of carbon being usual. A number of the most experienced tramway engineers have consistently sought an increase, without much success, however, as the makers object to such high carbon contents for technical reasons. Nevertheless this carbon increase seems the most obvious and logical road in the direction of preventing corrugation, unless a sufficiently cheap "alloy" steel can be produced.

There is also a question as to the manganese content. The high percentage manganese steels are very hard, but their ductility is also considerable. This is well shown by the way in which 50-ton to 70-ton manganese steel wire and steel can be bent and pressed to shape without distress, as clearly brought out in the manufacture of aeroplane parts.

Some experience seems to show that a high silicon content combined with high carbon is a good feature in rails. Certain lines built of such rails have remained free from corrugation during many years of service, and it is believed that high silicon facilitates manufacture in several respects.

These, however, are metallurgical questions on which the author is not competent to pronounce. What he suggests is that a rail steel is wanted which will carry rolling burdens of 50 tons per square inch or over, without deformation in dimensions, although deformation to the extent of formation of a uniform skin of rolling wear resisting properties is quite desirable.

For obvious reasons there is little opportunity of making progress in Europe in these directions, and we will have to content ourselves with studying corrugations for some years to come. But in the freer conditions of the United States experience and progress would seem to be possible, and the writer hopes that this discussion of his microscopic studies may lead to some more complete and effective threshing out of the matter than it has yet received.

Mechanical Aids in Accounting*

Voluminous Work of Milwaukee Accounting Department Necessitates the Operation of Many Labor-Saving Devices—What These Machines Are and How They Operate Is Described

By A. G. SCHWENKE

Auditor Railway Receipts Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

THE work of the accounting department of The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., covers not only railway, electric, heating and gas utilities, but also the accounting procedure for the Building and Loan Association, with a membership of 2101, embracing 3266 subscriptions. To handle the accounting for all these divisions and to keep pace with the increased work due to the comparative units and detailed information required on financial reports, etc., it has been necessary to put into operation many labor-saving devices. Just how the accounting department is able to utilize various mechanical aids in its work is described in the following paragraphs.

GENERAL ACCOUNTING WORK

Those who are not engaged in accounting work seldom realize how important a factor the calculating and listing machines (Fig. 1 and Fig. 2) have become. These machines multiply, divide, subtract or add, and are used in computing specific unit operating costs; extending invoices and stock manifests, utility service orders, payroll rates, and calculating statistical and financial data. They act as an important assistant in verifying and auditing all books and accounting. In fact, it only requires the services of a skilled operator to make the machines almost think. The work is greatly different from the laborious and long-drawn-out tasks of the old days, when it was necessary to make all calculations with paper and pencil.

Another interesting machine in use in the accounting department is the mailometer (Fig. 3). Prior to placing this machine in operation, it was customary for each department to seal and stamp its own letters. This system of handling mail was far from satisfactory, as the sealing and stamping of mail by hand was naturally a slow process. At the present time all mail matter from the various departments throughout the building is collected by the regular messenger service and brought to the accounting department, where the mail clerk takes charge of it. The mail is put through the mailometer, which operates by electric drive, automatically sealing, stamping and counting the envelops or postal cards at a great rate of speed. During last December 91,611 pieces of mail were handled through this machine.

Another machine which is a great labor-saver is the Edison disk mimeograph (Fig. 4). This machine makes possible the exact reproduction of typewritten letters, drawings and forms in unlimited quantities with great rapidity and at small cost. This machine is very useful not only to the accounting department, but to the whole organization. In fact, most of the work done on it is for other departments.

ELECTRIC SERVICE DIVISION

The electric service division is an important factor in the accounting department. This division handles the electric and heat service customers' accounts and collections, and at the present time has about 65,000 accounts. The majority of these are for electric service,

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*Abstract of paper read before the Milwaukee Company Section of the American Electric Railway Association.

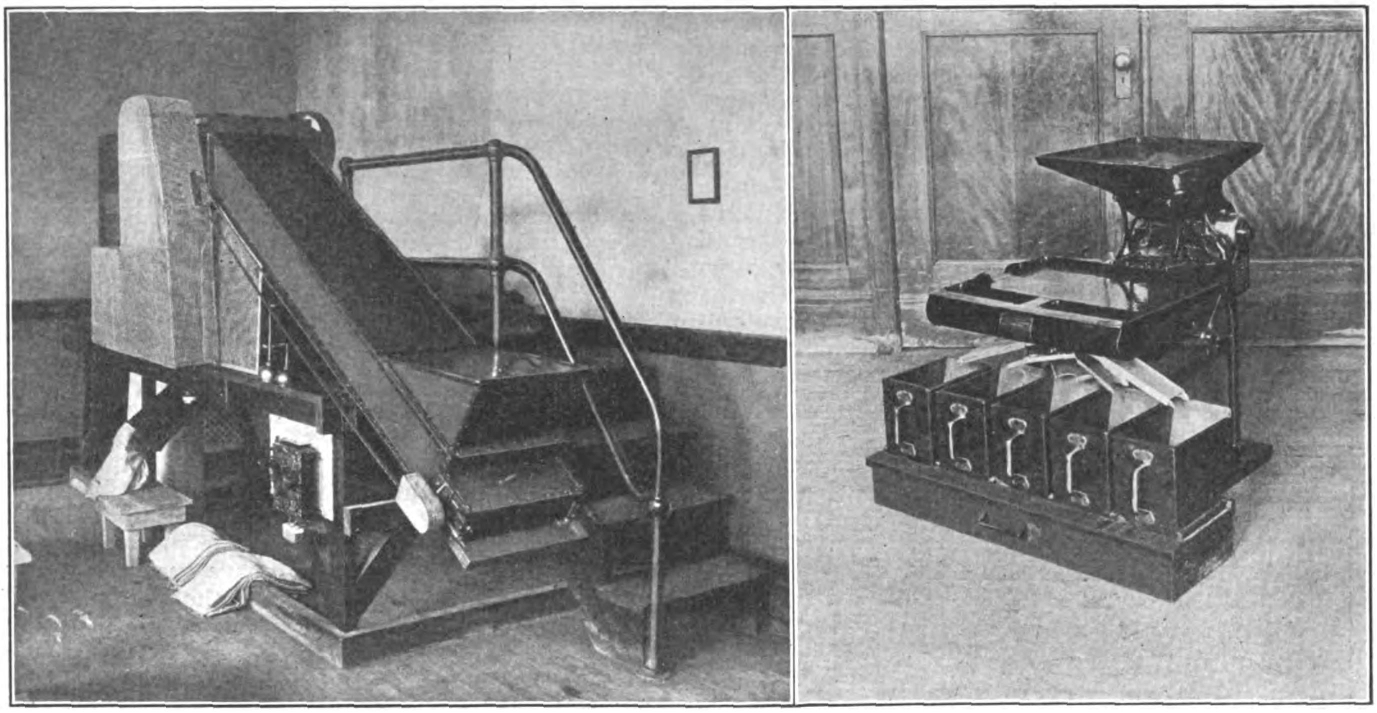
MECHANICAL AIDS—FIGS. 1 AND 2—EXAMPLES OF CALCULATING MACHINES USED IN ACCOUNTING DEPARTMENT; FIG. 3—MAILOMETER USED FOR HANDLING ALL MAIL FROM VARIOUS DEPARTMENTS; FIG. 4—DISK MIMEOGRAPH FOR REPRODUCING LETTERS, DRAWINGS AND FORMS

MECHANICAL AIDS—FIG. 5—GRAPHOTYPE AND ADDRESSOGRAPH FOR SENDING MONTHLY BILLS IN ELECTRIC DIVISION; FIG. 6—TABLES FOR HOLDING FARE BOXES ASSORTED BY LINES for which bills are rendered monthly and collections should be made monthly. The other accounts are composed of merchandise, wiring and sundry supplies and repair accounts. They also include accounts for the sale of appliances, many of which are sold under the instalment plan and require close following of monthly collections.

In issuing monthly electric-service and steam-heat bills, the addressograph (Fig. 5) is used in placing the customers' names and addresses on bills and stubs. The addresses are thus printed at the rate of approximately 3000 per hour. In connection with the addressograph a plate-making machine or graphotype (Fig. 5) is used. With this the customer's name and address are embossed on a zinc plate. The plate is then set in a suitable frame and is ready for the addressing of bills.

CASHIER'S DIVISION

The cashier's division of the accounting department has charge of all funds received from the various sources, and the banking of these. It also has charge of all tickets sold, the auditing at the various car stations and ticket agencies, and the working up of the semi-monthly payroll. A crew of about ten men is necessary to convey the daily deposits to the bank, owing to the large amount of small change received. Each man carries two satchels of coins. The supply car is used as the conveyance from the Public Service Building to the bank, and it is under the protection of a police officer when making the trip.



MECHANICAL AIDS—FIG. 7—MACHINE USED FOR SEPARATING COINS AND TICKETS; FIG. 8—MACHINE FOR SEPARATING COINS INTO VARIOUS DENOMINATIONS

A large amount of detail work is necessary to compute the payroll of the various departments; to make the proper deductions from the various pay checks, such as cash loans, dues and fees of the Employees' Mutual Benefit Association, payments on Building and Loan Association stock, etc., and to transcribe the names and amounts to the payroll checks for more than 4000 employees semi-monthly. At the present time most of the payroll work is being taken care of with the use of calculating and adding machines, typewriters with adders attached, and check writers and protectors. In former years most of the work was done with paper and pencil, and the checks were all written out in long-hand, which made it a tedious affair.

This division handles between 7,000,000 and 8,000,000 commutation tickets each month, which are sold at the various car stations to the conductors. It also handles all tickets sold by the ticket agents to the various points along the interurban lines, there being approximately 250 different kinds of agents' tickets sold. This volume of tickets sold, it will later be seen, necessitates certain mechanical aids in the division that deals with the auditing of railway recipts.

AUDITING RAILWAY RECEIPTS DIVISION

The layman must often wonder, and not without cause, as to what becomes of the accumulated fares on an electric railway. On the Milwaukee system the first operation necessary in handling the daily fares collected is the assorting, emptying, sealing and inspecting of fare boxes. When the fare boxes are turned over to the station clerk by the conductors after a day's work, he deposits a small identification card on the trap of each fare box to show on what line it was used. All fare boxes are collected daily from the various stations and are brought to the accounting department by the supply car, which reaches the department at 7 a. m. The boxes are there turned over to the fare-box clerk, who immediately assorts them by lines and places them on two large tables (Fig. 6). Each of these is about 20 ft. long and 4 ft. wide, and holds approximately 300 fare boxes. At the present time the company has a total of 1285 fare boxes in use on the Milwaukee city and suburban system. During 1916 these were used 193,768 times, or on the average 531 fare boxes were used daily.

After the fare boxes are assorted, the contents of the boxes for the different lines are emptied into large canvas bags and are then ready to be separated—that is, the tickets from the coins. The fare boxes are then sealed, and a general inspection is made to see whether or not the box is properly locked, and the teeth, trap, etc., are in proper condition. If any fare boxes are found not to be in proper working order, they are held out and forwarded to the shops for repairs. After the sealing and inspection the fare boxes are ready to be returned to the various stations.

Separating Tickets and Coins:

The separation of the tickets from the coins is accomplished with the ticket and coin separator (Fig. 7). The contents of the large canvas bags which contain the receipts of an entire line are deposited into the hopper of the separator. From the hopper the tickets and coins are conveyed to the shaker or agitator by a flight conveyor, which travels about 16 ft. per minute. The flights on this conveyor are about ¼ in. high and 3 in apart. The agitator is similar to a large flour sieve and is run by eccentrics, which operate at a speed of 280 movements per minute.

This particular agitator has three square screens, each having a surface of 595 sq. in. The wire meshes of the first screen are 1¼ in. square, those of the second 1 in. square and those of the third ¾ in. square. The purpose of the different sizes of wire mesh is to allow part of the tickets and coins to drop from the first to the second and third screens so as to spread them more evenly over the three screens. The wire mesh of the lowest screen permits the passage of coins but prevents tickets from dropping down the coin chute.

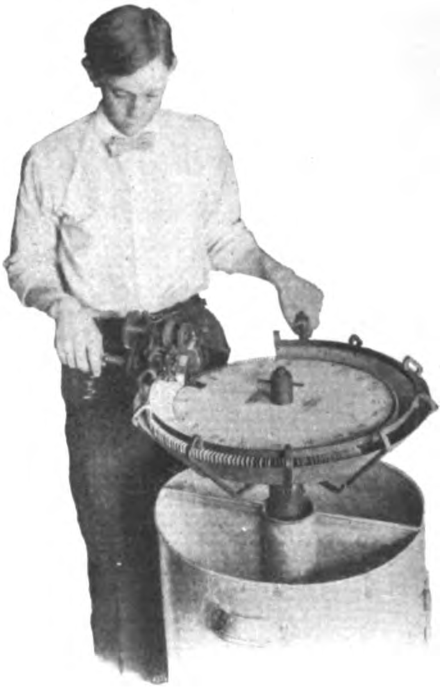
To separate the tickets from the coins, the agitator is set into operation, moving the tickets and coins about. The tickets are then cleared from the screen by means of a draft furnished by a 16-in. fan, and are carried to the ticket chute at the rear of the separator, from there going directly into a large paper sack. The fan is situated in the front of the screen or under the conveyor, and is operated by a ⅛-hp. motor, running at the rate of 1900 r.p.m. The motion of the screens causes the coins to drop through to the coin chute directly beneath. Approximately 250,000 tickets and 55,000 coins are separated daily. The average speed for this work is about 3500 tickets and 700 coins per minute.

MECHANICAL AIDS—FIG. 9—COUNTING MACHINE TO PREPARE COINS FOR BANKING

Sorting the Coins:

After the coins are separated from the tickets, there is another big job ahead—that is, to separate the different denominations of coins. This, however, is very easily performed by the use of an automatic coin sorter (Fig. 8), which separates the different denominations as desired. In order to save time and reduce the handling of the coins, the sorter is placed directly underneath the coin chute of the coin-and-ticket separator, the coins thus being fed directly into the hopper.

The hopper, which holds approximately 10,000 coins, is somewhat cone shaped. From it the coins automatically feed to the shaker, which is so fastened as to give it a slight forward slope. The shaker consists of five plates, with spout attachments, about 1 in. apart. The two upper or "nickel" plates are perforated with small openings a little larger than the size of a penny. The next two or "penny" plates have openings a little larger than the size of a dime, and the last or "dime" plate has openings a little smaller than a dime.



MECHANICAL AIDS—FIG. 10—TICKOMETER USED IN COUNTING TICKETS

An eccentric device operated by a 1/6-hp. motor gives the shaker a short forward and backward movement, sifting the different denomiations of coins through the small openings to their respective plates. From there the coins are shaken into small compartments placed in front of the separator, each denomination in a separate compartment. The motor also operates the device which feeds the coins to the plates at regular intervals. This machine separates approximately 1500 coins per minute.

Counting the Coins:

The next operation is to count the coins and prepare them for banking. This work is accomplished with the use of a Johnson coin-counting machine (Fig. 9). This device consists of a tray and a counter head for each denomination of coins.

The operation of this machine is very simple. The assorted coins are placed in the tray and fed into the machine with the left hand, the machine being set into motion by turning the crank with the right hand. The coins are conveyed to the counting mechanism through the medium of a sprocket. Three small gates are fastened in the channel around which the coins are carried by the sprocket to facilitate the filling of the latter. At the end of the channel is a shear over the sprocket which will admit but one coin at a time to the counting mechanism. If the machine is not overfed all coins will pass into the shear; but if overfed, some may ride over the shear and must then be run through the channel again to be counted. Should a bent or badly mutilated coin wedge into the separating shear, thereby choking the machine, a backward turn of the crank will bring it out to where it can be removed. As soon as the coins go through the shear they are passed to a smaller sprocket of the counting mechanism, which registers the coins and drops them into a sack attached to the spout of the machine.

The pennies are counted into sacks containing $1 each, the nickels into sacks containing $25 each and the dimes into paper wrappers containing $5 each. Some of the nickels are also done up in paper wrappers containing $2 each. These $2 nickel packages are used by the station clerks to supply the conductors with change.

When counting coins into paper wrappers, a metal tube is attached to the spout of the counterhead and a paper wrapper is inserted. This is held in place by a support which covers the opening at the bottom end of the tube and holds the wrapper in place. A cogwheel is attached to the cyclometer which regulates the number of coins and automatically stops the machine when the desired number has been counted into the wrapper. The operator then removes the filled wrapper and crimps the open end.

Counting the Tickets:

The next step is the counting of the tickets. This work is performed through the use of a tickometer. Four of these machines are used to count the accumulation of tickets collected daily on the Milwaukee city and suburban system. All tickets are put up in small stacks or bunches, 150 to 200 tickets in each, this operation being necessary before they can be counted on the tickometer. The tickets are then placed in the feeder of the machine. By turning the crank, which is operated with the right hand, several small rubber wheels are set into operation which convey the tickets from the feeder to the rim. There each ticket goes into a clip and at the same time is registered, the machine being so adjusted that it will not feed more than one ticket at a time.

When the rim is filled, the tickets are dropped into the ticket holder underneath by pulling down the lever held in the left hand. This lever operates a brass strip above the tickets, which pulls them from the clips. The machine is equipped with a disk which is numbered from 1 to 150. These numbers are so arranged that every clip will cover one number, and the operator is able to tell immediately the exact number of tickets counted into the clips instead of using the register, which would necessitate the recording of the beginning and the ending readings.

An efficient operator is able to count approximately 30,000 tickets per hour. The advantage in using this machine over the old system is that a more accurate count can be made and the tickets are also handled in much less time.

After the tickets are counted, they are placed into large double paper sacks, holding approximately 30,000 to 35,000 tickets each, and are sealed with strips of paper. These sacks are conveyed to one of the boiler rooms three or four times a week and are destroyed in furnace fires.

The Government Printing Office, Washington, D. C., has reduced the price on paper-bound copies of the National Electrical Safety Code to 20 cents each. Copies bound in flexible cloth are sold at 30 cents each. The code contains 323 pages.

Treated Red Cedar Poles in Demand

Western Red Cedar Association Discusses Effect on Consumption of New Method for Treating Poles

The annual meeting of the Western Red Cedar Association was held on April 3, in Spokane, Wash., with representatives of nine lumber companies in attendance. E. T. Chapin, president of the association, in an address submitted elaborate statistics of the lumber industry which indicated that the chief competitor of Western red cedar was Northern white cedar. Out of 567,000 Western red cedar poles used in 1915, 422,000 went to electric railways, light and power companies, but only 239,000 Northern white cedar poles went to this class of consumers. Northern white cedar seems to be used almost entirely by telephone and telegraph companies and steam railroads, the total consumption by such companies of white cedar in 1915 being 1,507,000 poles, or about 90 per cent of all the white cedar used in that year. The consumption of chestnut poles from 1907 to 1915 inclusive is about the same for each year. During the same period the consumption of cedar poles, including Northern white and Western red, has increased slightly. The consumption of pine in the same years has increased from 156,000 in 1907 to 546,000 in 1915, but its use is confined almost entirely to poles less than 20 ft. long. Consequently, the Western red cedar pole has little to fear from this competition.

One of the developments of the past year has been the new method adopted by cedar dealers for treating poles. By the new method, commonly known as the "B" treatment, a deep penetration of creosote is given to the butt of the pole. Statistics compiled covering the sale of poles during January, February and March of 1916, and covering the same period in 1917, show that during these three months of 1916 the treated poles sold were 16 per cent of the total sales, while during the same period of 1917 the treated poles sold were 35 per cent of the total sales. In view of this significant fact Mr. Chapin predicted that the industry is close upon the era when practically all poles sold will be treated.

The difficulty that has been encountered in the past has been in getting in a deep penetration, because poles were not sufficiently well seasoned, but the puncturing method that has now been evolved bids fair to overcome this trouble. The puncturing of the pole for 18 in. above the ground line and for 18 in. below, with knife-like blades, permits the oil to spread between the annular rings, and results in an even penetration. Hardly any of the fibers of the wood are broken, and it is not anticipated that the trade will object to the punctures, especially when they are fully advised of the benefits derived. It has been found that poles which have seasoned only six months can be given a fine penetration by this puncturing method.

Other business of the association included the appointment of a commmittee authorized to arrange, within the next ninety days, a series of comparative strength tests in Spokane of Western red cedar and various other kinds of poles, including the different kinds of steel. This committee is to secure the services of some competent engineer to outline and conduct the experiments, and is to invite a representative of the United States Forestry Department to be present, also prominent engineers from all over the country.

Election of officers for the ensuing year resulted in the selection of the following: President, F. C. Culver, Sandpoint, Idaho; vice-president, O. S. Hanson, Spokane, Wash.; and secretary-treasurer, G. A. Clark, Spokane, Wash.

The Maintenance of Way Department To-day*

The Author Submits a Discussion of Methods, Equipment and Results Obtained in the Maintenance of Modern Track

BY B. R. BROWN
Engineer Maintenance of Way Dallas Electric Company

IN the past ten years the cost of track in dirt streets has increased from $12,000 to $20,000, and in paved streets from $35,000 to $50,000 per mile, whereas, in contrast, on account of heavier cars, faster and more frequent service, the life of the track is practically the same, or less. If track costing $40,000 per mile has an average life of ten or twelve years with ordinary and delayed repairs, and we can increase the life of that track from two to five years by efficient and timely repairs, it is well worth the expense.

These conditions have brought into use many efficient and economical types of equipment for use in the maintenance and construction of track, most of which are now in general use, and have proved their merits.

Contrast the old wooden concrete board of a few years ago to the electric-driven, self-propelling concrete mixers now in general use. By the use of the mixer the labor cost of mixing concrete has been reduced from $1 per cubic yard to as low as 30 cents per cubic yard. The saving effected on 5000 cu. yd. of concrete will more than pay for the mixer, and with the mixer you get a more uniform mixture with the correct proportion of ingredients carefully calculated, thus assuring a better quality of concrete.

The electric track drill, electric spike drivers, and pneumatic tie tampers are excellent examples of the modern tools used on maintenance of way repairs, and on construction work. They effect a saving in labor, but first they perform better and more efficient work. The work can be speeded up, and more work per day accomplished, and at the same time the cost of the repairs will be less than the same work performed by crude and antiquated methods.

For the removal of cupped joints, a very efficient machine has been developed in the reciprocating track grinder. The machine is used more, perhaps, for removing corrugations from the rails, but for either use it is especially adapted.

On the Dallas Consolidated Electric Street Railway, from May 1, 1916, until Jan. 1, 1917, a total of 2410 joints were planed to a true surface at a cost of 35 cents per joint. This included labor, oil, tools, grinder blocks and repairs. Joints should be replaned every eighteen months to two years. If we start with the new track and keep the joints planed we will increase the life of the track from 15 per cent to 40 per cent and at the same time will effect a saving in the cost of making repairs, which will be necessary if the track is allowed to just "run along." This is as true of bolted joints as it is of welded joints, for if the cup is kept out of the joints the bolts will not so quickly become loose, and the joint will remain intact.

On one piece of track that has been operated for three years, 378 joints were planed at an average cost of 13½ cents per joint. Only three or four joints on this street had started working loose, but they all showed a slight cupping.

One of the more expensive jobs, per joint, was on track seven years old that served our heaviest city traffic. On account of the traffic this work was done at night. A total of 303 joints were planed at a cost per joint of 44½ cents. This work was done in July, 1916, and to date these joints show no signs of the returning of the cupping, while the track is in excellent condition.

On corrugation grinding the reciprocating grinder has been just as efficient. Our records show the cost of removing corrugations to vary from 2½ cents to 3½ cents per foot, depending upon the depth of the corrugations and traffic conditions.

Another very efficient machine in general use on track repairs is the Indianapolis electric welder. The writer is indebted to V. W. Berry, Fort Worth, Tex., for his experiences with this machine: On Front Street, in Fort Worth, the Northern Texas Traction Company had a section of double track built of 7-in. 80-lb. T-rail on wood ties and solid concrete foundation. One track was welded by the Goldschmidt butt-weld method, and on the other track continuous joints had been used. This section of track had only been built about eight years, but on account of the heavy city and interurban traffic was in very bad condition and it would have been necessary, in a very short time, to have completely rebuilt it. The bolted joints were all loose, cupped and working badly, and the welded joints nearly all were broken.

In rehabilitating this track 10-ft. sections of new rail have been cut in and with the Indianapolis welder angle bars welded to the rail. It was also necessary to build up the ball of the rail on the worn sections to conform with the new pieces of rail, and it was here that the welder proved its merit. Then with the reciprocating grinder these joints were planed to a true surface and paving replaced. The result has been entirely satisfactory, and the life of this track has apparently been prolonged for at least three years. Without the welder this track could have been repaired only by the cutting in of new pieces of rail and the applying of bonds and continuous joints, and in a manner, the same results would have been obtained, but inside of twelve months these joints would again have been loose and it would be necessary to make still further repairs. A comparison of the cost of these two methods of repairing will show that the work performed with the welder cost from $3.50 to $5 less per joint, and with the welder a more permanent work has been accomplished.

For companies that have a large amount of asphalt paving to maintain the use of the portable asphalt heater and mixer will prove economical and efficient. This machine is a combination heating plant and mixer designed for bituminous concrete road mixtures and for sheet asphalt, rock asphalt and cement concrete work. One very successful machine of this kind is sold by the Koehring Machine Company of Milwaukee. The machine is driven by a 15-hp. 550-volt motor fed from the trolley. This motor serves to operate either the mixer, the mechanical charger, the hot blast apparatus or to propel the machine.

By disconnecting the blower and asphalt tank and connecting the water line the hot-mixer may be used as an ordinary concrete mixer. With this portable plant, asphalt paving can be taken up and relaid at a cost of 40 cents to 50 cents per square yard. Instead of paying paving contractors from $1.50 to $1.80 per square yard for repairing asphalt paving we now do the work with our own plant and forces, and we not only are able to do three times the amount of repairs for the same money, but can also, by efficient handling of the mixtures, perform more satisfactory work. There is hardly enough work on the average city system to keep such a machine continuously at work on asphalt paving repairs, but this repair force need only be a gang of a foreman and fifteen men, and by training they can be used on other classes of paving and track repairs when not actually engaged on asphalt repairs.

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*Abstract of a paper presented at the thirteenth annual convention of the Southwestern Electrical and Gas Association at Dallas, Tex., April 26-28, 1917.

These are just a few of the many modern, efficient and money-saving pieces of equipment that are adaptable to track repairs on the average-size railway system. There is a tendency to hesitate in the purchase of such equipment because of the first cost, but a little figuring on the possible saving in cost of repairs will convince the most skeptical that they would do well to investigate the subject of economical and scientific track repairs.

Present-Day Operating Problems*

The Author Reviews Conditions Which Affect Electric Railway Companies in Their Endeavors to Furnish Satisfactory Service

BY V. W. BERRY
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THE patrons of a street railway company are interested in but one thing. That one thing is service. And from their viewpoint, service is affected by arrangement of tracks, schedules, type of rolling stock and treatment accorded by employees. Therefore, it is note enough that we make excuses for low speed, infrequent service, interrupted schedules, unclean or uncomfortable cars, or discourteous treatment of our patrons by our salesmen. Steps must be taken to correct these conditions, otherwise we will have a dissatisfied public to contend with.

A few years ago the street car was the fastest vehicle on our streets. To-day, except on such lines as have had the schedules materially quickened, street cars are about the slowest vehicles on our streets. Our cars may be slow because traffic conditions are considered such that the danger of accidents would be too great to run faster. What is more likely, the speed just happens to fit the length of a particular line with a certain number of cars in service; and, furthermore, as the same speed has been maintained for years, it is thought it should be satisfactory to-day. Or, perhaps, we are using cars not adapted to higher rates of speed. It is possible that a thorough investigation might result in a material increase in speed, which would surely be greatly appreciated by the public, after which we may be in a better position to ask our patrons to "step lively."

Infrequent headways on some lines might be compared with elevator service that would be given to a tall building, where 200 people wished to ascend and descend every hour, with a car designed to carry fifty people, and operated every fifteen minutes, the management of the building taking the attitude that, as the four trips per hour would carry all of those desiring to ride, there was no necessity of giving a more frequent service. The result would probably be that some of those desiring to ride would walk, particularly those going to or from the lower floors, while those going higher would probably complain of the poor service, and perhaps "move off the line"—an expression sometimes heard.

A few years ago, fifteen and twenty-minute headways were not uncommon, and were considered frequent in many cities. To-day we must give a more frequent service if patronage is to be retained, otherwise our patrons will be picked up by vehicles which come along more frequently, and are more speedy than our cars.

Large cars operated infrequently necessarily make a great number of stops, which reduces the average rate of speed; whereas small, light-weight cars, making less stops, accelerating and decelerating rapidly, can be operated at a much higher rate of speed. On many lines the cost of operating large, heavy cars makes frequent headways impossible, whereas it may be possible to operate small, light-weight cars at a reduction in cost sufficient to enable operating a more frequent headway, with the result that the speed can be materially increased. This combination of a more frequent headway and increased speed will surely result in increased earnings, and better satisfied patrons.

Schedules are interrupted and cars are delayed from many causes, some of which are congestion of traffic, car failures, broken wires, derailments, accidents, fires, water, and "dollar" watches. The co-operation of public officials, and the enactment of additional laws regulating traffic, may be necessary to obtain relief from some of the delays caused by congestion of traffic, but surely it is not necessary to tie up the entire system of a city for an hour or so for a circus parade, on account of operating single-end cars on single-track lines, with no means of turning back, or for lack of crossovers suitably located on double-track lines where double-end cars are operated. We must provide for just such emergencies, otherwise we are in no position to solicit the co-operation of the public and public officials in a campaign to better traffic conditions, as affecting the movement of our cars.

Car equipment will sometimes fail, and wires will break, even though of modern type of construction, and most carefully maintained. Derailments and accidents will occur with the strictest discipline and most careful operation. To minimize the length of such delays, emergency vehicles with self-contained power units must be available and ready for instant use, so that they can be rushed to the scene of trouble with the least possible delay.

Another important matter, and perhaps the largest single operating problem confronting street railways to-day, is the selection and training of transportation employees. It has been said that the success or failure of a retail merchant depends upon his selling organization. The same may be true in the street railway business; for, surely, in selling transportation, a nickel's worth at a time, we are conducting a retail business, and as in the case of the large retail store, our salesmen are the ones that meet the public, and to a great extent mold public opinion.

In selling transportation, as in selling any commodity, wide-awake, clean, courteous salesmen, who realize their responsibility, must be employed, and we must know that our patrons are receiving that polite and courteous treatment to which they are entitled, before we attempt to enlist their co-operation in a campaign of courtesy.

In order to know that we are furnishing sufficient reliable service at all times, it is also necessary that a keen supervisory force of trained traffic men be maintained. With such an organization, supplemented with such improved devices as terminal clocks, headway recorders, telephone dispatching system, etc., we should be able to keep close enough in touch with the volume of traffic, and movement of cars, to be reasonably sure that our patrons do not know more about our business, from the standpoint of service, than we know ourselves.

In the matter of furnishing a satisfactory service, operators of street railway properties are to-day undoubtedly facing the most serious situation in the history of the business. Therefore, in conclusion, let us not forget that service is the one thing that the public is interested in, and service is what we must give them, by operating clean, comfortable cars, on a frequent and speedy schedule, and manned with courteous salesmen.

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*Abstract of a paper presented at the Thirteenth Annual Convention of the Southwestern Electrical and Gas Association of Dallas, Tex., April 26-28, 1917.

War Conditions and the Electric Railways

This Is a Period of Preparation, and Many Electric Railway Companies and Individuals Are "Doing Their Bit"

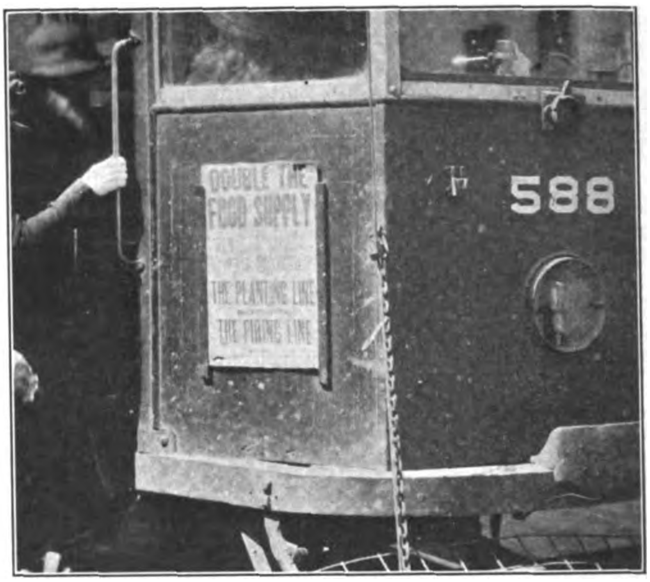
A SERIES of notes in the last issue of this paper told of some of the steps being taken by electric railways following the declaration of war with Germany. These included protection of strategic points on their systems, co-operation with the Council of National Defense and other matters. This week other war notes are published.

BOSTON ELEVATED HELPS TO INCREASE THE FOOD SUPPLY

The electric cars in Boston are being used to promote the important service of food conservation and production, as illustrated in the accompanying photograph of a dash sign in general use in the Boston metropolitan district. Taking the slogan "The Planting Line Supports the Firing Line" as the watchword, these signs carry the injunction "Double the Food Supply. Plant a Garden This Spring." Thus they carry a widespread appeal of a most timely character to the general public to do what it can in adding through local soil cultivation to the food resources of the country. The Boston Elevated Railway and the Middlesex & Boston Street Railway are vigorously co-operating with the Massachusetts Committee on Public Safety in this deserving publicity.

To show that it is doing its own part in this work, the Boston Elevated Railway this week threw open to employees for vegetable gardening about 300,000 sq. ft. of unused land owned by the company in the vicinity of carhouses and other property of the road. About sixty plots of land, averaging 5000 sq. ft. each, have been assigned at different locations for use by employees with families, on the basis that crops are to be raised for their own consumption and not for sale. The company has on hand a certain amount of fresh manure, which it will haul to these plots of land free of charge, until the supply is exhausted. The company is plowing this land free of charge. So far as possible the company will also plow any land situated near its lines which employees own or have obtained from others and on which they are raising crops for their own families, the company furnishing the plows, horses and driver.

Division superintendents have been requested to talk with the local sub-committee on food conservation of the public safety committee in the cities and towns of their districts and also with private individuals, to obtain other available land for crop production by employees who cannot be accommodated on land owned or controlled by the company. The company will assist by free plowing of such land as soon as its own property has been plowed. Detailed assignments of land are to be made by heads of departments and division superintendents under the direction of Major Thomas F. Sullivan of the department of maintenance of way.



UNITED STATES UNDER WAR CONDITIONS—DASH SIGN IN BOSTON URGING FOOD CULTIVATION

APPLICATION FOR SPECIAL TARIFF

The Pennsylvania Public Service Commission has approved the application of the Pittsburgh Railways Company to put into effect a special tariff relating to the transportation of the United States soldiers.

DEMONSTRATION FOR RAILWAY RECRUITS AT OTTAWA

The shopmen of the Chicago, Ottawa & Peoria Railway had a flag-raising on April 15 in honor of three of their members who have enlisted for the war, and the event was made the occasion of a general patriotic demonstration in front of the shops by other citizens of Ottawa. Some 3000 persons were present, and the accompanying illustration shows them gathered around the flagpole erected just in front of the car shops.

The exercises began with a drill by the members of the military company of which the enlisting shopmen

UNITED STATES UNDER WAR CONDITIONS—FLAG RAISING IN FRONT OF SHOPS OF CHICAGO, OTTAWA & PEORIA RAILWAY IN HONOR OF RECRUITS FROM THE RAILWAY are members. The flag was then raised by the three railway recruits. Then followed addresses by the Mayor and others. The platform was occupied by prominent citizens, including municipal officers, Civil War veterans and representatives from the Red Cross and other patriotic societies.

SCHOOL FOR WOMEN CONDUCTORS IN TOLEDO

According to a bulletin issued from the New York office of Henry L. Doherty & Company, the Toledo Railways & Light Company is considering the starting of a school to train women to act as conductors. Since the company announced that it would pay all salaries of the men who enlisted and keep their positions for them, many trainmen have joined the colors.

RECRUITING LITERATURE ON CARS

The United Railroads of San Francisco has offered to the recruiting officers in that city to carry on its cars for distribution folders used to advertise the service. The marine recruiting office has accepted this offer, and "Take One" boxes are being installed on the United Railroads' cars. A similar plan is to be followed on the Municipal Railway cars.

SUGGESTIONS IN CONFIDENTIAL BULLETIN ADOPTED

The bulletin on preparedness recently issued by the American Electric Railway Association to its members and containing various suggestions of what they might do to help the Government during the war has received general commendation. A number of electric railway companies have put the measures in force. A copy in the natural course of events was filed with the Council of National Defense and in this way came to the attention of some of the steam railroads, and several of them have adopted the suggestions so far as they applied to steam railroad conditions.

RECRUITING STIMULATED BY COLONEL KEALY

P. J. Kealy, president Kansas City Railways, is colonel of the Third Missouri Regiment. He was in the East at a military conference when the word came to start recruiting actively and wired his instructions to subordinates. When he arrived on the scene he took personal charge to stimulate filling of the companies, and quick work resulted. It is said that the railway members of the Third Regiment now in various companies will be assembled in one company, into which others from the Railways Company may enter.

Safety Work in Pittsburgh

At the present time the National Safety Council is very active in Pittsburgh. A comprehensive plan has been developed, under which the entire industrial district has been divided into fifteen sections. Each of these has a safety committee, with a chairman and a secretary. The fifteen chairmen constitute the local executive committee.

These fifteen subdivisions do not cover the public utilities in Pittsburgh, but it is planned that Cecil G. Rice, assistant to the president, Pittsburgh Railways, shall organize a committee for such enterprises. Mr. Rice's idea is to have a committee composed of the coroner, a member of a court, a county commissioner, a councilman, a legislator, a life insurance expert, a casualty company representative, the president of the Team Owners' Association, the president of the Automobile Owners' Association, a delegate from the Congress of Women's Clubs, an educator, a newspaper man, a local representative of the Workmen's Compensation Board, a clergyman, an attorney, a doctor and a representative of the city Department of Safety. This committee would have subdivisions as needed.

It is contemplated that after the organization of such a committee safety work will be carried on in the schools until they close in June, and that attention will be turned during the summer to traffic conditions. In Pittsburgh, it is said, there are more accidents from automobiles than from street cars. Some time during 1917 a big safety rally will probably be held in Pittsburgh.

In order to get the street railway more interested in the work, it is expected that Mr. Rice will appoint one of his men as secretary of the committee. Recently the Associated Bureaus of the Pittsburgh Railways held a meeting, which was attended by the president of the company, the general manager, department heads, members of the Associated Bureaus and others. C. W. Price, field secretary of the National Safety Council, discussed the possibilities of accident prevention. The chiefs of the welfare bureau and the medical bureau explained their work, and Mr. Rice talked about the cost of accidents. It is planned that a larger safety organization will now be formed in the local company.

Concrete Poles Made by the Centrifugal Process

Principles of Machine Used and Properties of Products Were Outlined at Meeting of Railway Telegraph Superintendents

At a meeting of the Association of Railway Telegraph Superintendents held in Chicago on April 19 W. H. Lienesch, chief engineer Universal Concrete Products Company, Chicago, Ill., discussed the subject of the manufacture and properties of hollow concrete poles. He said that the new centrifugal process had been developed to produce a pole free from the great weight, high cost and fragile characteristics of the solid pole; a pole having more reliable qualities as to shearing value, from the ground line to the butt, and cheaper to manufacture, than the hollow pole made with a collapsible core. For this purpose a machine containing a revolving metal form is employed, the process of manufacture being briefly as follows:

The lower half of a circular metal form is placed on rollers set in line with a machine constructed to revolve the form in a horizontal position. The half form is filled with wet concrete material, a fabricated cage of reinforcing steel is laid into the concrete, the upper half of the form is placed in position, and the entire form, concrete and steel, is rolled into the machine. After suitable clamps have been applied, the form is revolved for several minutes at a high speed causing the concrete to be compressed against the sides of the inside of the form with a pressure varying from 75 to 300 lb. per square inch. This produces a dense concrete structure having a smooth hole through the center and walls tapering in thickness from end to end.

Immediately after turning the pole is removed, in the form, from the machine and allowed to set for twelve hours. After this the upper half of the form is removed and the pole is rolled out into a bed of fine sand where it is allowed to harden for ninety-six hours. It is then removed to a storage yard and, after being cured under water for ten days, is ready for shipment.

Mr. Lienesch stated that the weight of a pole constructed by this process is only one-half that of a solid concrete pole of equal strength and two and one-half times that of the best cedar poles which have but one-half the strength of the concrete poles. To overcome the shearing action which occurs on both sides of the pole along horizontal lines, coinciding with the plane of the neutral axis, frequent spirals are wound about the longitudinal bars in the hollow centrifugal pole. Thirty-seven-foot poles made by the centrifugal process have been transported at the age of ninety-six hours by wagons over rough streets for a distance of 5 miles, indicating that the curing process is not absolutely necessary to permit them to be handled.

Organization of the West Penn Railways

THE division of duties among the officials of the West Penn System is clearly shown in the radial diagram reproduced herewith. The companies comprising this system do a diversified lighting, power and railway business in western Pennsylvania.

The president of the company is Samuel Insull who, with one of the vice-presidents, J. F. Gilchrist, and the consulting engineer, Frederick Sargent, is located in Chicago. The property is directly administered from the offices in Pittsburgh. The railway department is one of the four main divisions of the property and it is under the direction of Williston Fish, vice-president.

Reporting to Mr. Fish are ten departments as shown. For operation and maintenance the railway property is separated into three divisions, each with its operating superintendent and superintendent of track and roadway. The operating superintendents are Daniel Durie, O. P. Hess and W. B. Atwood. In charge of track and roadway are P. A. Meyer, Mr. Hess, who performs two functions in his division, and W. A. Underwood, all reporting to J. L. Fritsch, chief engineer of roadways and structures.

Kansas City Railways' Power-Saving Campaign

THE Kansas City Railways has recently conducted a coasting or power-saving campaign, using four coasting recorders, with very satisfactory results. The campaign was planned by Julien H. Harvey, superintendent of efficiency. On the lines where the recorders were used the average of coasting was increased from 8.2 to 24.6 per cent, and this result was used to stimulate the men responsible for power consumption.

The first phase of the campaign consisted of the issuance of a series of seven daily bulletins. The first was on a 4-in. x 6-in. card which was widely distributed. Succeeding bulletins were on letter-sized sheets and these were posted at carhouses and other points. Following the week's campaign there has been an effort on the part of the traveling instructor to impress upon new and old motormen the importance of coasting.

The first bulletin contained the "Five Principles of Efficiency" as follows: (1) Never use power and brakes at the same time, except when necessary to operate a track switch. (2) Notch up the controller uniformly. (3) Don't rest with the controller on the resistance point. If you want to go slow for any reason coast until time to apply brakes. (4) When braking stop the car with one application of air. (5) Coast—coast—

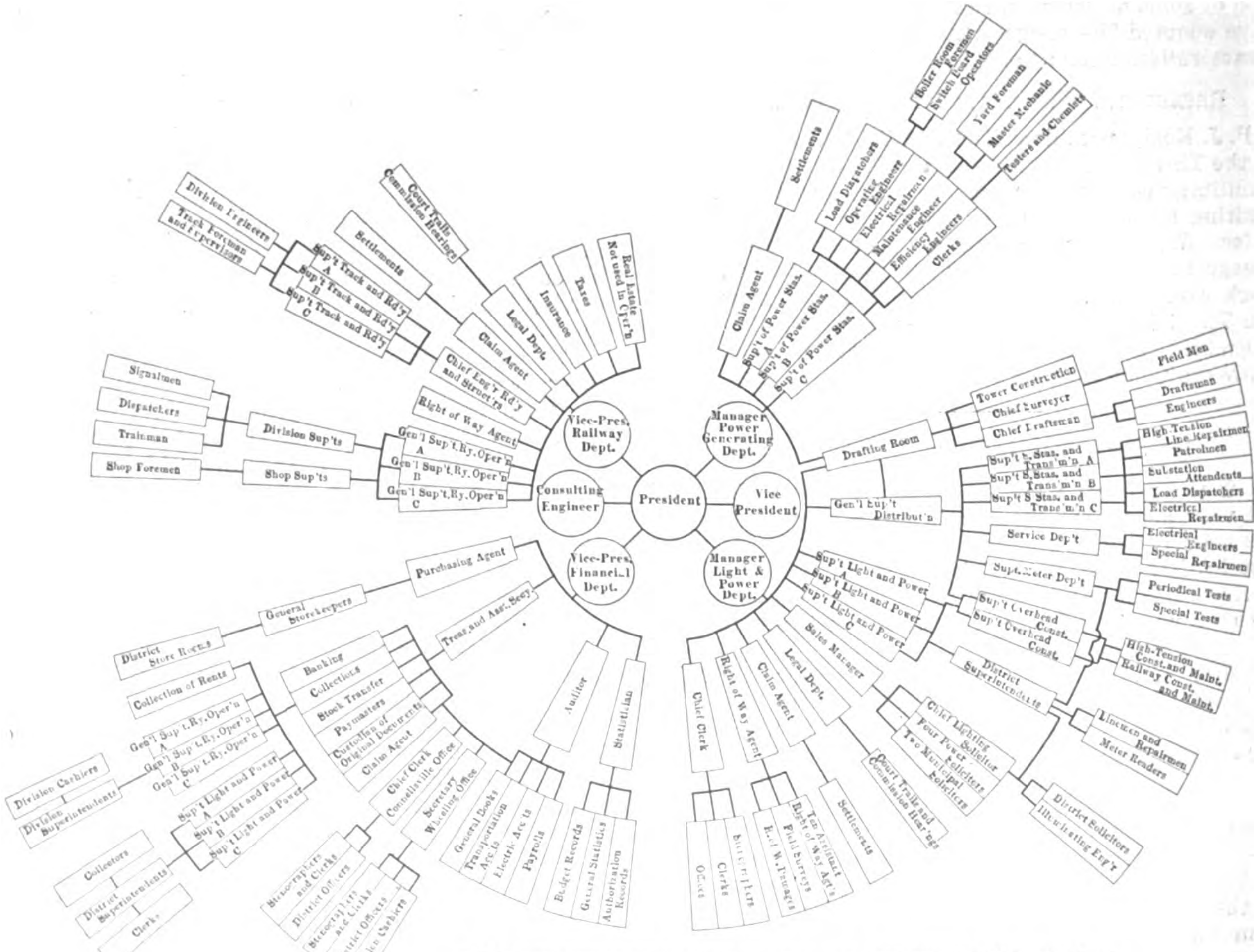

President
Vice President
Vice-Pres. Railway Dept.
Consulting Engineer
Vice-Pres. Financial Dept.
Manager Power Generating Dept.
Manager Light & Power Dept.
Division Engineers
Track Foreman and Supervisors
Sup't Track and Rd'y A
Sup't Track and Rd'y B
Sup't Track and Rd'y C
Settlements
Court Trails Commission Hearings
Claim Agent
Legal Dept.
Insurance
Taxes
Real Estate Not used in Oper'n
Chief Eng'r Rd'y and Struct'rs
Right of Way Agent
Signalmen
Dispatchers
Trainman
Shop Foremen
Division Sup'ts
Shop Sup'ts
Gen'l Sup't Ry. Oper'n A
Gen'l Sup't Ry. Oper'n B
Gen'l Sup't Ry. Oper'n C
Claim Agent
Settlements
Sup't of Power Stas. A
Sup't of Power Stas. B
Sup't of Power Stas. C
Load Dispatchers
Operating Engineers
Electrical Repairmen
Maintenance Engineer
Efficiency Engineers
Clerks
Boiler Room Foremen
Switch Board Operators
Yard Foreman
Master Mechanic
Testers and Chemists
Drafting Room
Tower Construction
Chief Surveyor
Chief Draftsman
Field Men
Draftsman
Engineers
Gen'l Sup't Distribut'n
Sup't S. Stas. and Trans'm'n A
Sup't S. Stas. and Trans'm'n B
Sup't S. Stas. and Trans'm'n C
High Tension Line Repairmen
Patrolmen
Substation Attendents
Load Dispatchers
Electrical Repairmen
Service Dep't
Electrical Engineers
Special Repairmen
Supt. Meter Dep't
Periodical Tests
Special Tests
Sup't Overhead Const.
Sup't Overhead Const.
High-Tension Const. and Maint.
Railway Const. and Maint.
Sup't Light and Power A
Sup't Light and Power B
Sup't Light and Power C
District Superintendents
Linemen and Repairmen
Meter Readers
Sales Manager
Chief Lighting Solicitor
Four Power Solicitors
Two Municipal Solicitors
District Solicitors
Illuminating Eng'r
Legal Dept.
Court Trails and Commission Hear'ngs
Claim Agent
Settlements
Right of Way Agent
Tax Assistant
Right of Way Ag'ts
Field Surveys
Real Est. Managers
Chief Clerk
Stenographers
Clerks
Offices
Statistician
Budget Records
General Statistics
Authorization Records
Auditor
General Books
Transportation Acc'ts
Electric Acc'ts
Payrolls
Treas. and Ass't. Secy.
Banking
Collections
Stock Transfer
Paymasters
Custodian of Original Documents
Claim Agent
Chief Clerk Connellsville Office
Secretary Wheeling Office
Stenographers and Clerks
District Officers
Stenographers and Clerks
District Officers
Division Cashiers
Purchasing Agent
General Storekeepers
District Store Rooms
Collection of Rents
Gen'l Sup't Ry. Oper'n A
Gen'l Sup't Ry. Oper'n B
Gen'l Sup't Ry. Oper'n C
Sup't Light and Power A
Sup't Light and Power B
Sup't Light and Power C
Division Cashiers
Division Superintendents
Collectors
District Superintendents
Clerks

CHART SHOWING THE ORGANIZATION OF THE WEST PENN SYSTEM coast—all you can consistently with your schedule. Coasting does not mean going downhill at high speed. It means cutting off power and drifting until it is necessary to apply the brakes for slowing down or stops.

Succeeding bulletins explained how to secure the most coasting, stating the results of coasting tests on the Prospect line, and contained elaborations of the five principles already mentioned.

American Association News

Company Section Committees Are Considering the Definition of Electric Railway Transportation Terms—Martin Schreiber Explains to the Newark Section the Essential Requirements for Advancement in the Railway Field—Other Section Activities

Electric Railway Transportation Terms

The definitions which were compiled in December for the use of company sections with a view to securing constructive comment are being considered by committees of the several sections. The suggestions for revision are to be in the hands of Secretary Burritt by June 1, so that there is now about one month remaining to complete this work. The present compilation is made up of the recommendations of several committees. When adopted it will form a useful glossary which will have a tendency to make the literature of transportation more accurate and specific.

Lecture on Electricity at Chicago

At the April 17 meeting of the Chicago Elevated Railroads' section P. B. Woodworth, professor of electrical engineering at the Lewis Institute, delivered the third of a series of experimental lectures on "Electricity." Secretary P. V. Lyon writes: "We all came away with a pretty clear idea of the meaning of a watt." The "Definition of Electric Railway Transportation Terms" report of the Transportation & Traffic Association, compiled for the use of company sections, was considered and referred back to the appropriate local committee.

President E. J. Blair made some remarks regarding national defense, and explained to those who desired to enlist that they need not go outside of the railway properties to do so. The attendance at the meeting was about one hundred.

Satisfaction and Progress in Work

At the April meeting of the Public Service company section Martin Schreiber, chief engineer Public Service Railway, read a carefully prepared paper on the subject "Find a Way—or Make One." The paper was addressed to the men who have a tendency to be dissatisfied with their progress. Some of the high points are covered in the following paragraphs.

A certain number of men are satisfied with their work, having learned that this condition is largely a matter of peace of mind. These have educated themselves to keep their daily demands within their means. There are, however, many who are dissatisfied, largely through their own fault, and, according to Mr. Schreiber, it is up to these men to make a way out of their difficulties or to find one.

After citing a number of examples of men who had reached success by overcoming difficulties, he said that common sense, enthusiasm and industry are the most important elements in success. The first-named includes character, judgment and understanding of men, including one's self. In addition to these a certain amount of knowledge is required—there must be some special training to round out the progressive man's characteristics.

Progress involves the acquirement of additional knowledge. The motorman or conductor, for example, should interest himself in the problems of the dispatcher, the shopman and the track man; in fact, in the problems of the men in all departments. As knowledge is acquired it should be imparted to others, in order that poise and resourcefulness may be developed. In time promotion will result if warranted, for as a general proposition every company believes in promotion if it is actually justified.

In addition, however, to the acquirement of knowledge there must be determination and enthusiasm. It is the latter which distinguishes a real virile man from the shiftless, indifferent sort. Enthusiasm attracts; it suggests loyalty and sincerity, and creates confidence. The electric railway man must be enthusiastic regarding the service which his company is giving. He must have an ideal before him and this, in a surprising way, will serve to lighten his daily tasks.

Manila Section Welcomes C. N. Duffy

The feature of the March 6 meeting of joint company section No. 5 was the address made by C. N. Duffy in response to a welcome extended by the section on the occasion of his return from the United States. At the business session which preceded the address E. I. Jeffery was elected a director in place of W. A. Seten, resigned, and one applicant for membership was elected. The attendance at the meeting was forty-seven.

After brief welcoming remarks by O. Keesee, superintendent of transportation M. E. R. R. & L. Co., Mr. Duffy paid a tribute to the employees of the company for their co-operation with him during the past three years, referred to the opportunities ahead of the ambitious man, and then told something of the observations made during his recent tour.

Contrasting the railway operating conditions in Manila with those in Hongkong and Shanghai, he said that in Hongkong last year the street railway traffic had increased 25 per cent to 35 per cent over the previous year due to influx of population from Canton and vicinity. In spite of the limited equipment the company is doing a rushing business, the stock sells at five times par, and a dividend of 22½ per cent is paid. In Shanghai with twenty-six miles of track 650,000 people are served as compared with forty-four miles and 275,000 people in Manila. The Shanghai Tramways gave 499,000 car-hours of service in 1915 as against 405,000 in Manila, while the respective numbers of revenue passengers carried were 59,000,000 and 12,500,000.

Mr. Duffy's conclusions, after studying working and living conditions in Japan, China, Korea and elsewhere, were that the Filipinos enjoy the best conditions found in the Orient. In Hongkong and Shanghai, for example, platform men do from two to five times as much work as those in Manila and receive less than one-half as much pay.

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Locomotive Crane Pays for Itself in One Year

Electrically-Operated Machine Used Twenty-three Hours a Day During the Rush Season

BY FRANK L. AIME
Pittsburgh (Pa.) Railways

In contrast with other methods of handling materials in storage yards and other places on an electric railway property, a locomotive crane has the advantages of economy, mobility and quick adaptability to the service required. The crane which is being operated by the Pittsburgh Railways is in service during the winter months on an average of twelve hours a day, while in the summer season while the track work is being done it is usually operated twenty-three hours a day, in two shifts of eleven and one-half hours each. No other tool could have been bought which would have met the demands put upon it by the different operations in the storage yards. For example, a car of 60-ft. rail can be quickly unloaded, the rails being piled 30 to 50 ft. from the track. The crane can then be moved under its power to another part of the yard, and with the hook replaced by a grab-bucket a workcar of ballast can be unloaded. Then the grab-bucket can be taken off, a lifting magnet attached and the crane is ready to load a car of scrap iron or unload steel wheels.

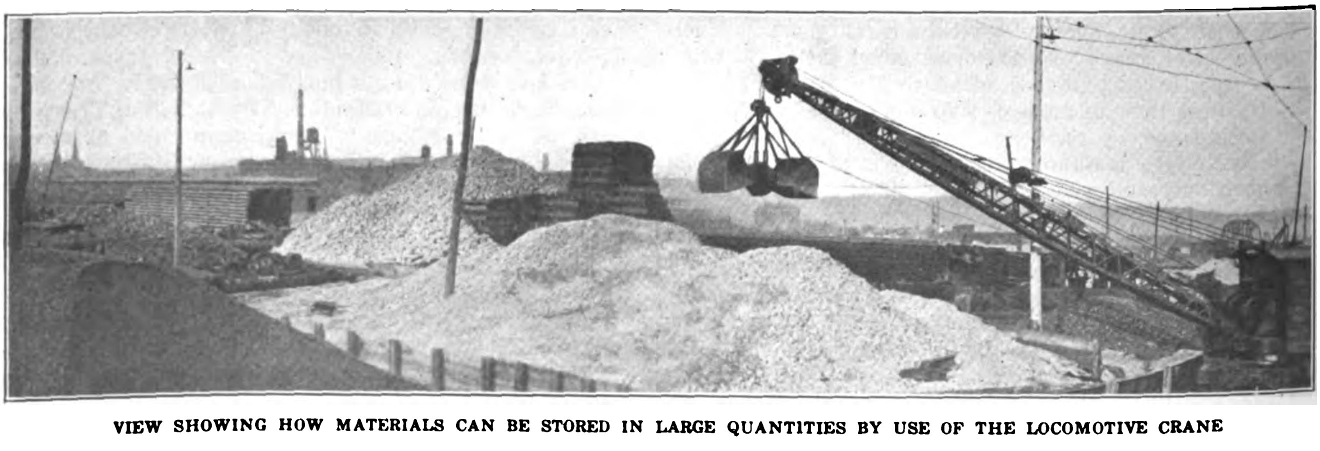
CONSTRUCTION DETAILS

The crane was designed according to the specifications submitted by the Pittsburgh Railways and was built especially for them by the Browning Company, Cleveland, Ohio. It is the first one of its kind ever made. Other cranes of this type have been propelled along the track by a motor in the turret, the power being transmitted to the truck by shafts and gearings. This method could not be used in this case as it was necessary that this crane be able to "negotiate" a 35-ft. radius curve. The trucks were, therefore, designed to carry their own motors. The trucks are of the archbar type with 6-ft. 2-in. wheelbase, 34-in. wheels and each carries one 100-hp. motor. Truck centers measure 10 ft. 10 in. The compressor for the air brakes is hung on one of the trucks.

The deck frame is 22 ft. 10 in. long, 8 ft. 7 in. wide and stands 3 ft. 9 in. above the rail. All open space in the deck framework is filled with scrap iron for ballast, except that occupied by the air tank. The turret is located midway between the trucks and is designed to allow the boom to swing completely around. The cab over the turret was built as low as possible, 13 ft. 8 in. from top to rail, in order to pass under bridges, of which there are many on the system. The boom is 42-ft. long. At its maximum radius of 48 ft. from the center of the turret the crane will lift 5 tons without outriggers, and at a radius of 12 ft. can handle 15 tons. The weight of the crane ready for service is 65 tons net.

The utility of the crane would be cut down considerably if it were not possible to change over from the grab-bucket to the lifting magnet or hook in a short time, since many of the routine jobs, such as loading a car with sand and gravel, take but twenty minutes and other jobs perhaps less. With the first grab-bucket used the end of the lifting cable was attached in a laborious manner which consumed at least thirty-five minutes for each change; that is, seventy minutes for changing over and back. It did not pay to make this change to do a thirty-minute job, and a means was sought to speed up the changing operation. B. J. Yungbluth, general storekeeper, solved the problem by having a slot cut in the face of the drum of the bucket, as shown in one of the accompanying illustrations. An open socket fastened to the end of the lifting cable is slipped through the slot and when the cable is tight the socket is locked against the small end of the slot. In addition to this a hinge pin is put through the idler pulley on the bucket. It is necessary to remove this pin to attach or detach the bucket, and the rigid pin with a cotter pin at each end which was previously used required a special tool to handle it. The grab-bucket can now be changed in two minutes instead of thirty-five.

Part of the equipment used with the crane is a lifting magnet designed to operate at 220 volts with a current

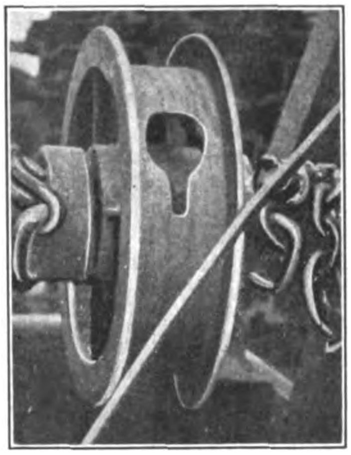


VIEW SHOWING HOW MATERIALS CAN BE STORED IN LARGE QUANTITIES BY USE OF THE LOCOMOTIVE CRANE of 27 amp. Under most favorable conditions the magnet will lift 20,000 lb. Power from the trolley wire is used and the voltage is cut down from 600 to 220 by means of a grid resistor located on the turret. Brake shoes, tie rods and scrap iron disappear here and reappear there with almost magic swiftness when the lifting magnet is used.

Operating Methods

The limited space in the yard made it impossible to lay the trolley tracks along one of the spur railroad tracks from which rail, ballast and other heavy material is unloaded, hence the trolley track is laid to straddle the railroad track, and the crane comes up behind a car and unloads it readily because of the length of the boom. In the case of the 60-ft. rail which is shipped in on two cars, the boom cannot reach to the center of the rail, but the grab-hook is carried out to the center and the rail is dragged toward the crane and then lifted and swung out to the pile.

There is no trolley wire over this straddle track, but the power is supplied to the crane by means of a cable with a special waterproof insulation and steel armor. This drags along the ground as the crane moves. The cable is connected to the trolley feeder about in the middle of the length of a spur. To relieve the electrical connection at the crane of the mechanical strain caused by the dragging of the cable, a small chain is attached to the cable near its end and hooked into a ring on the side of the crane deck. The circuit from the cable to the turret is completed through knuckle connectors located on each side of the car. A double-throw switch in the turret is used to change from overhead trolley to cable current supply, so that when the trolley pole is used the bare knuckle connectors are dead.



SLOT CUT IN DRUM OF GRAB-BUCKET TO FACILITATE ATTACHING OF LIFTING CABLE

The other trolley wires in the yard are 30 ft. above the rail, and while this allows considerable freedom for the boom, the crane could probably do 50 per cent more work without a trolley wire above it. This system is, therefore, unsatisfactory in this respect but must suffice until some better means is obtained for transmitting power to the cars in the yard.

The matter of costs is very gratifying when they are compared with the other methods of handling the same work. It is conservatively estimated that with one crane operator and three crane attendants the machine will perform the work of a foreman and twenty-five laborers. An analysis of comparative cost, based on 300 ten-hour working days per year, follows:

Yearly Cost of Manual Labor

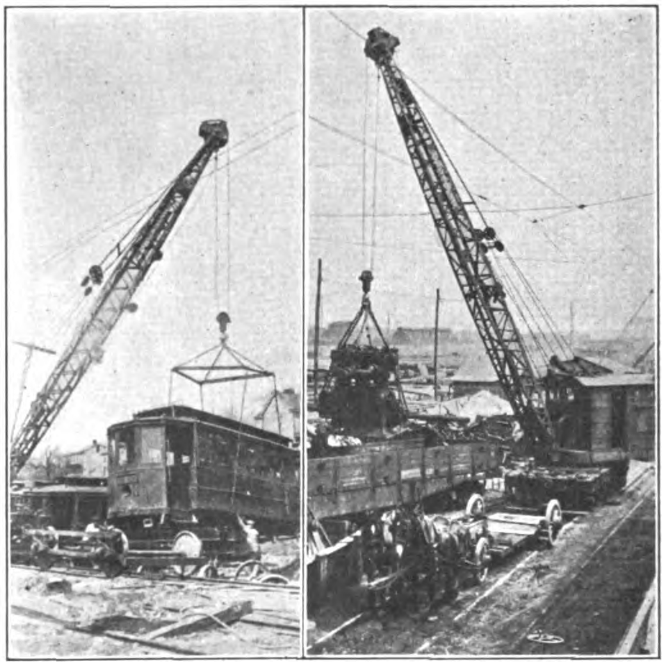
One foreman at $3 per day, 300 days	$900
25 laborers at $2 per day, 300 days	15,000
Total	$15,900

Yearly Cost of Crane Operation

1 crane operator at $3 per day, 300 days	$900
3 crane attendants at $2 per day, 300 days	1,800
Interest on investment 6 per cent of $10,000	600
Depreciation 8 per cent of $10,000	800
Power, estimated	300
Total	$4,400

A balance of $11,500 in favor of the crane shows that it pays for itself in one year if operated for only ten hours per day. As we operate it longer hours the saving is relatively larger. Since a power-consumption test has not been made on the crane the exact cost of power is not known; however, the amount given here is thought to be a generous estimate. Repairs on the crane so far have been practically negligible. During the past four months it has been in the shop but two days. In 1916 it was in the shop nineteen days, thirteen of which were spent in a general inspection which is made once a year.

Mixed sand and gravel or similar materials have been handled with a 1¼-cu. yd. grab-bucket at an average cost of 1¼ cents per ton, based on unloading from a railroad car and dumping in a pile whose apex is 25 ft. from the crane track. This is in contrast to 8 cents per ton, the cost before the crane was put in service. Fifty tons of coal can be unloaded with the grab-bucket in an average time of twenty-five minutes. As an example of what can be done with the lifting magnet, ten kegs of railroad spikes or eight 34-in. wheels can be taken at one lift. A carload of 3200 brake shoes can be unloaded and piled 15 ft. from the track in an average of forty-five minutes.



TWO JOBS ILLUSTRATING GENERAL UTILITY OF LOCOMOTIVE CRANE

The crane was placed in operation in August, 1914, and since that time it has been in constant use. Because of the demand for it in the East Liberty yard it is seldom used elsewhere, although it is possible to run it to other parts of the system if necessary. Appreciation is due Mr. Yungbluth for data and information which made this article possible.

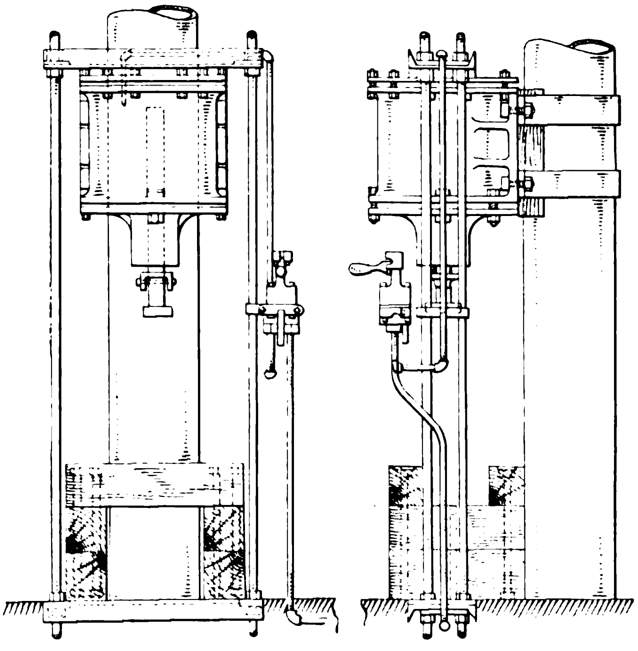
A fully equipped garage with machine shop, wagon shop and vulcanizing plant, always ready to receive emergency calls, is maintained by the United Railways of St. Louis. The first automobile trouble wagon was built in the early part of 1907 and is described in the issue of the Electric Railway Journal for Jan. 4, 1908, page 22. Eleven of these tower automobiles are now in service and one is under construction. The company also operates cars for handling freight, trucks, trouble wagons, money wagons, and one ambulance car.

Press for Removing and Installing Armature Bearings

Brake Cylinder Device Costs but Forty Dollars and Takes the Place of Hydraulic Press—Bearings Are Not Distorted and Do Not Require Scraping

BY R. H. PARSONS
Electrical Foreman

Since the almost general adoption of the box-frame motor, the bearings of which are placed in the frame heads or housings under pressure, a device for installing and removing these bearings has become a necessity. The pressure necessary to install a properly fitted bearing is about 5 tons, as recommended by the electric manufacturing companies, and for this a hydraulic press is best adapted. As such a machine is frequently not procurable, a cheap but satisfactory press can be made from a brake cylinder of sufficient capacity. Brake cylinders have already been used for this purpose so that the idea is not new, but the manner of adaptation herewith illustrated is entirely satisfactory and if used heretofore has not been described.


Front View Side View

BRAKE CYLINDER DEVICE FOR INSTALLING AND REMOVING ARMATURE BEARINGS

A cylinder, capable of exerting a force of 14,000 lb. at a pressure of 70 lb. per square inch, is suspended on a suitable post by means of clamps. Across the top of cylinder and bolted to it is placed a 6-in. channel iron properly shimmed to provide bearing to the solid parts of the cylinder. Buried in the floor, and set at the floor level, is a duplicate channel iron, connected to the other by four 1-in. tie rods. These tie rods take all of the strain of the stroke so that the cylinder suspension sustains only the cylinder's own weight. An ordinary brake valve attached to the tie rods and easily accessible to the operator provides means for controlling the action of the piston.

A bench, constructed of heavy pine timber reinforced by tie rods, is also provided. On this bench are placed the housings for pressing the bearings in or out.

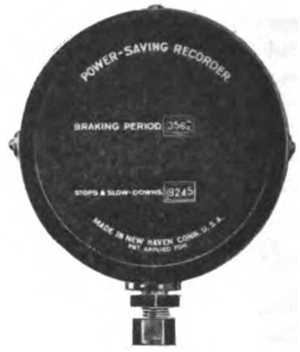
By the use of the brake cylinder device, the need of a hammer is obviated, and therefore time is saved in installing and removing the bearings. Also a bearing is not distorted by this device and so does not require scraping to make it fit the shaft. The outfit can be fitted up for approximately $40, whereas a hydraulic press of suitable size and shape would cost $200.

Another Device for Encouraging Power Saving

A Clock and Counter Mechanism Records Duration of Braking Periods and Number of Stops and Slowdowns

The Connecticut Company is equipping its cars in New Haven with a new device for encouraging motormen to save energy in car operation. The device is the invention of William Arthur, until recently a member of the engineering staff of McHenry & Murray, consulting engineers of New Haven, Conn.

The "power-saving recorder" is designed to record the length of time during which air pressure is on the brake cylinder, and also the number of times that pressure is applied. It achieves its object by encouraging men to coast more and to avoid unnecessary stops and slowdowns. The mechanism is contained in a circular iron case about 5 in. in diameter and 3 in. deep with dials showing in figures the accumulated braking time and number of brake applications. For convenience in subtracting totals to determine elapsed braking time and corresponding numbers of brake applications, the recording mechanism is operated backwards—that is, successive totals are increasingly smaller instead of larger, as in most recording devices. This feature lessens the clerical effort required in making records. The recorder is preferably placed on the vestibule frame directly in front of the motorman so that he can read the indications whenever he is disposed to do so.



FACE OF POWER-SAVING RECORDER

The mechanism consists of a substantial clock movement such as has been developed for automobile service, together with a pneumatic controlling device. Air pressure from the brake cylinder acting upon a piston in a tiny cylinder at the bottom of the recorder case raises a piston stem carrying a lead weight. The latter has the function of positively returning the piston to the off position. To the upper part of the stem is attached a spring brake which bears on a grooved brake wheel

POWER-SAVING RECORDER IN POSITION ON CAR

when in the off position. During the releasing operation this brake spring serves to set the clock mechanism instantly in motion.

The clock drives the duration-of-braking dial, and at each rise of the piston the brake-application counter is moved forward by means of a simple lever system. The only aperture in the case is a small hole to permit the insertion of the clock-winding key, the hole being covered with a dust cap between windings. The clock spring is of capacity sufficient for two weeks' operation, the assumption being that it will prove most convenient to wind the clock weekly, the extra capacity being provided for reserve.

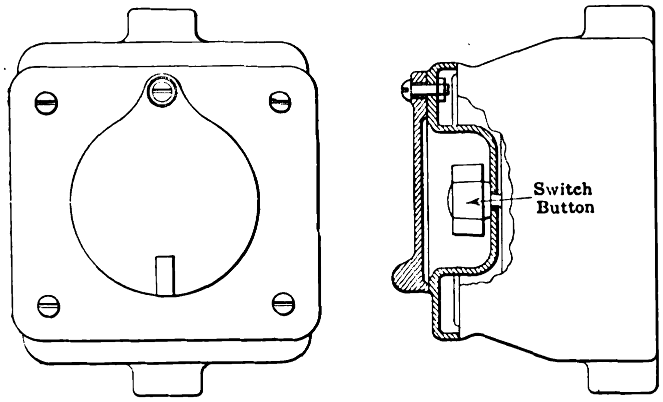
The principle upon which the new recorder is based is that in general and for the same conditions, the man who has coasted the most will have had his brakes on the least. Excepting for resistance losses practically all of the excess energy put into a car has to be finally dissipated by the brakes in grinding away the brake shoes and wheels, so that in general the less energy wasted during braking periods the less will be the total energy consumption.

Condulets with Protected Snap Switches Replace Cluster Boxes

Condulets for the control of street clusters and designed for a General Electric No. 626 combined snap switch and cut-out are being used by the Brooklyn Rapid Transit to replace the present wooden boxes containing a knife switch of the single-throw, quick-break type and a fuse mounted on the same base. The condulets are the YC-11303 type, manufactured by the Crouse-Hinds Company. The wooden boxes, being of light construction, have not lasted long and were frequently damaged by boys, necessitating the removal of the entire cabinet and switch with connections. Often a door has been broken off and the switch and interior of a box exposed. Another disadvantage has been that a person attempting to close a switch was liable to receive a shock, particularly at night, by touching the exposed metal parts between which there might be an electrical pressure of 600 volts.

CONDULET ATTACHED TO TROLLEY POLE

In the condulets a swinging cover protects the switch-button fittings. These fittings are designed to be shock-proof and will not become damaged from water, the only exposed part being the stud. Grounding is made through a ½-in. conduit which is attached to an iron trolley pole.



DETAILS OF CONDULET

Reclaiming Worn Armature Shafts

BY C. L. KELLER

Assistant Master Mechanic Detroit United Railway

The Detroit United Railway has been realizing a marked saving in the maintenance of old-type motors through the use of an electric welding outfit. Nine out of ten of these older type armatures which come in for repair because of worn or broken bearing shafts, keyway or pinion seat, are in good condition as far as the armature coils are concerned, but to replace the shaft with a new one requires the complete rewinding of the armature. Instead of doing this, the worn parts are built up or breaks repaired by the use of an electric welding device, and this is possible without disturbing the windings.

The accompanying photograph shows a number of armatures which have been repaired by this means and are ready to be re-turned to standard dimension. This process has saved the winding of two or more armatures a day for the company, with a corresponding saving in material and labor. The time required to build up an entire shaft end, including bearing, keyway and pinion seat, is about two and one-half hours.

ARMATURE SHAFTS BUILT UP BY ARC WELDING

Trolley Wheel Machining Costs Reduced

Improved Methods Devised at the Shops of the Boston Elevated Cut Down Labor Costs Very Materially

Improved methods of machining trolley wheels at the Albany Street shops of the Boston Elevated Railway have lately been devised. The company manufactures its own wheels, which are now standardized at a 4¼-in. diameter, and turns out 7000 wheels a year.

In machining the wheels after they have been received from the brass foundry seven principal operations are performed: (1) chamfering inner edge of bore; (2) rough drilling bore; (3) finishing bore; (4) squaring off hub, with counterbore at each end; (5) putting wheel on mandrel and turning groove; (6) pressing in bushing; (7) reaming out bushing to take off surplus graphite. These operations can be performed in from five to six minutes. The longest part of the work as regards any individual task is the turning of the wheels, which takes less than one minute.

A time-saving feature of the chuck, which is used in holding a wheel for chamfering and drilling, is illus-

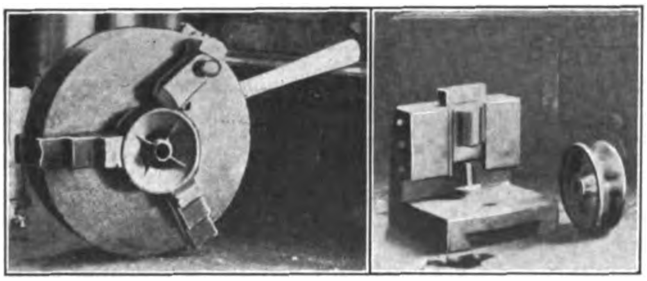


FIG. 1—CHUCK WITH ONE LOOSE JAW; FIG. 2—REVERSIBLE TURNING TOOL

trated in Fig. 1. One of the jaws of the chuck is made loose so that, by a simple turn of the jaw, a wheel can be centered in place for machining. The chuck is a 12-in., three-jaw universal equipment. Two jaws of the usual type are built up about ⅞ in. by electric welding. The loose jaw, 3½ in. long by 1⅛ in. thick, is held at one end by a ⅝-in. bolt that is tapered into the chuck body. By this device a wheel is clamped into place by properly shaped jaws and thus allows quicker and more accurate work to be done than by the old method when the wheel was caught by the edges.

Another device for saving time, shown in Fig. 3, is the special turret of cast iron which is provided with receptacles and locking arrangements for the chamfering, rough finishing, and finishing of tools. When in use, a short bar, not shown in the illustrations, is attached to the tailstock of the 18-in. engine-type lathe and adjusted to bear upon the under side of the turret so as to brace it and relieve the strain on the tailstock. In this way the change from one tool to another can be made with the least possible delay. In Fig. 4 is shown a tailstock spindle bonnet used on the lathe. This bonnet has two slots ¾ in. long placed on opposite sides, and is locked in position by two ⅜-in. steel pins, thus forming two bayonet joints. At the right hand end of the bonnet is attached a shrunk-on handle. By making a half turn the tailstock can be released and pulled out by hand to the required distance for adjusting the tool or changing the work, instead of having to crank the tailstock out of the way as in former lathe work. Cast iron was first used for the bonnet, but was replaced as it cracked at the joint.

The turning tool employed, as shown in Fig. 2, is shaped for the standard wheel groove and is designed so that the tool can be reversed when the upper edge becomes dull. By this device, a total of 100 wheels can be turned without requiring a change of the tool edges. The tool is seated in a head provided with gibs and a shim which are adjustable by set-screws to the tool wear. The head is of cast iron and fits the lathe ways.

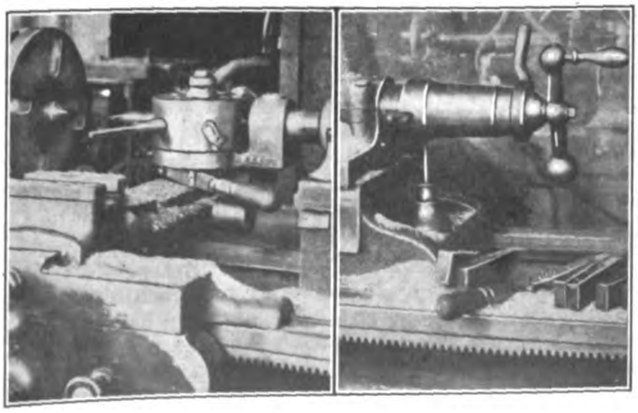
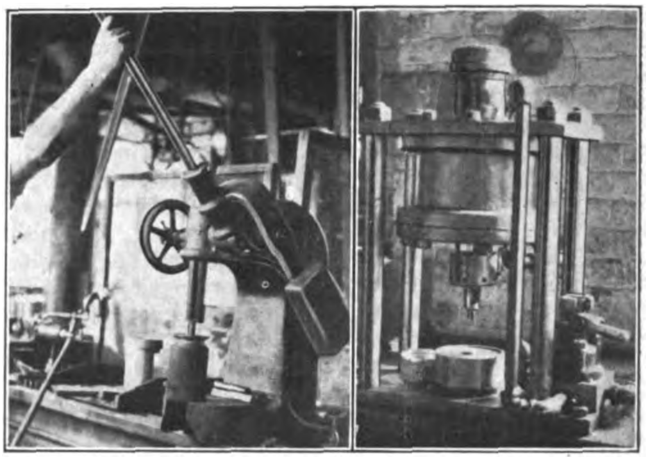


FIG. 3—TURRET; FIG. 4—SPINDLE BONNET



FIGS. 5 AND 6—OLD AND NEW BUSHING METHODS

Formerly bushings were forced into place by a hand-operated press appearing in Fig. 5. It was necessary to start a bushing into the wheel bores from the bench, and in setting them home at least two strong pulls on the 3-ft. 6-in. lever were required. Results were correspondingly unsatisfactory. Fig. 6 illustrates the present method, which employs a home-made pneumatic press having a cylinder 7¼ in. in diameter with a 4-in. stroke. The cylinder is attached by nine ⅝-in. cap screws to a headplate carried on four 1½-in. cold rolled steel columns. Above the cylinder, a chamber is provided containing a spring head against which the piston drives in its upward stroke, the motion of the piston being controlled by a three-way valve in the air piping.

Air is supplied at a pressure of 85 lb. per square inch. The bushings, of the "Bound Brook" type, are of ⅞-in. outside diameter, ½-in. inside diameter and are 1½ in. long. Graphite is used for lubrication. The trolley wheel rests in a recessed base with a spiral spring centering plug of nearly a ⅞-in. diameter which is slightly depressed as the bushing is driven home. The recess in the base is about ⅛ in. deep and holds the wheel in place during the entire operation. Five bushings per minute can easily be set home, including placing and removal. The bushing is forced home by a plunger equipped with centering plug slightly less in diameter than the inside diameter of the bushing itself. By the use of the above described equipment, the entire labor cost of trolley wheel machining is stated by the company to have been reduced to 2.77 cents per wheel.

Oxy-Acetylene Welding Makes Strong Pipe Joints

The investigation of the relative strengths of acetylene-welded and screwed pipe connections, when subjected to internal pressure, has been the subject of a series of investigations in the machine construction laboratory of the University of Kansas. The welded specimens were made by the Oxweld Acetylene Company, Chicago, Ill., while the screwed connections were made with malleable-iron couplings by expert pipefitters.

The following conclusions have been drawn from the results of the experiments:

1. The strength of a welded pipe connection is practically the same as that of unwelded pipe. By slightly building up the weld it can be made stronger than the rest of the pipe.
2. The strength of the welded pipe connection is much greater than that of the malleable-iron screwed fitting.

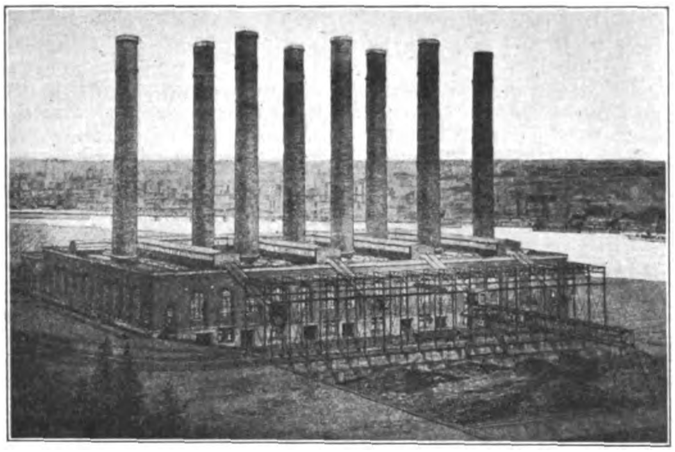
3. Although a careless or inexperienced operator may produce a leaky joint by the welding process, nevertheless, if the pipe is tested for leaks when installed, it should cause no difficulty in service.

The time required to make the screwed connections is about the same as that required to make a welded joint in the same pipe, but the cost of the welded joint is less.

A Big Power-House Project

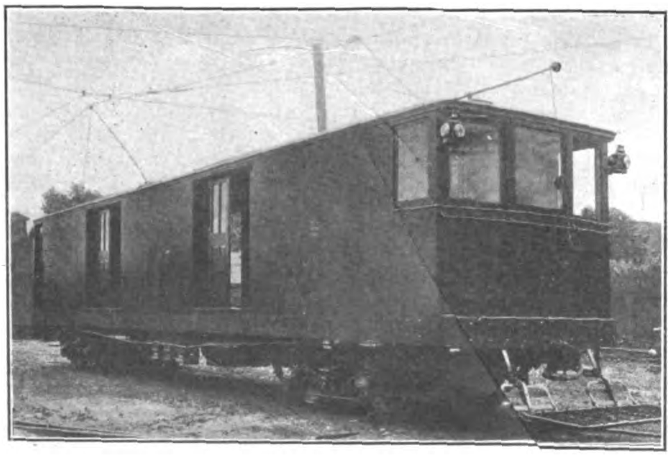
The accompanying illustration is from a pen sketch of the new power house of the Toledo Railways & Light Company as it will appear when completed. It is expected that the first unit, taking in the space occupied by three stacks in the picture, will be completed by December of this year. Work is being rushed night and day for this purpose. By next spring three 20,000-kw. units will probably be in operation, and the plant as shown is designed for an ultimate capacity of 200,000 kw. The total cost will be about $8,000,000.

The plant is located in East Toledo, the 24-acre site including some made land which will extend to the dock line of the river. It will ultimately be 425 ft. wide, 600 ft. long, and there will be eight radial brick stacks, 274 ft. high, with inside diameter of 18 ft.

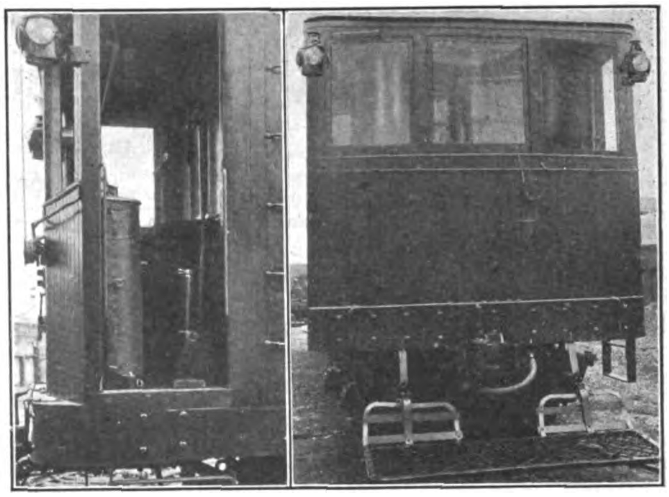


PROPOSED POWER PLANT FOR TOLEDO RAILWAYS & LIGHT COMPANY, EAST TOLEDO, OHIO

The plan is to take coal from the cars by means of cranes, drop it into crushers and convey it into the hoppers. The ashes will be received in conveyors and delivered to freight cars, so that the same cars that bring in the coal will take out the ashes. A storage house for 200,000 tons of coal will be erected alongside the plant.



GENERAL VIEW OF NEW INTERNATIONAL RAILWAY EXPRESS CAR



SIDE AND FRONT VIEWS OF VESTIBULE OF NEW INTERNATIONAL RAILWAY EXPRESS CAR

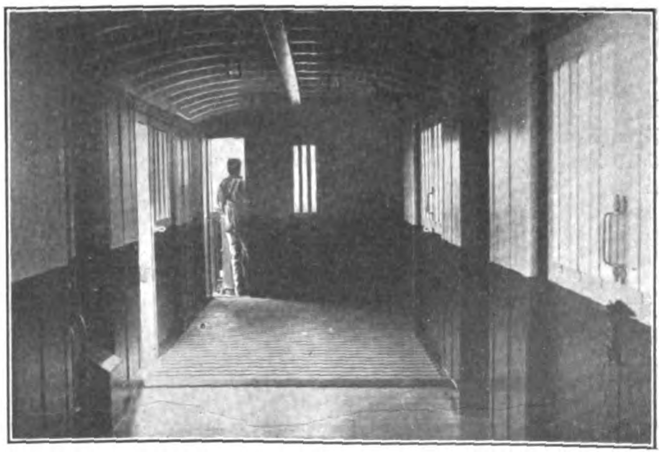
New Express Cars for the International Railway

During the past winter the International Railway has been using in express service two cars of a type designed by the company's mechanical department. These were built at the Cold Spring shops of the company at Buffalo. The accompanying illustrations show the construction of the car clearly. Attention is, however, directed to the following salient features:

The car is arranged for double-end operation with a shallow motorman's vestibule on each end. In each vestibule is a compactly arranged control equipment for the motors, air brakes, sanders, whistle, etc., and a well-lighted desk for the keeping of records. The interior of the car is well lighted through windows at the ends and glazed panels in all of the side doors. It is neatly finished and provided with hooks attached to the carlines for the reception of long slender packages. For night lighting fifteen lamps are provided, these being carried in sockets mounted on the under side of the roof and protected with simple strap-iron guards.

The car is equipped with four GE-210 motors geared for a free-running speed of 45 m.p.h. It weighs, completely equipped, 60,240 lb. The general dimensions are as below:

Length over bumpers	48 ft. 6 in.
Length inside express compartment	40 ft. 9 in.
Width inside express compartment	7 ft. 8½ in.
Height inside express compartment, at center	8 ft. 3 in.
Width overall	8 ft. 6¼ in.
Height from top of rail to top of trolley base	12 ft. 4½ in.
Height from top of rail to under side of side sills	3 ft. 3 in.
Wheel base of trucks	5 ft. 0 in.
Wheels, rolled steel	34 in. diam.



INTERIOR VIEW OF NEW INTERNATIONAL RAILWAY EXPRESS CAR

News of Electric Railways

Traffic and Transportation
Financial and Corporate **Personal Mention** **Construction News**

State Commission Control Upheld

Illinois State Supreme Court, in Case Pending Nearly a Year, Decides Public Service Commission Has Control Over Chicago Utilities

The State Supreme Court of Illinois on April 19 rendered a decision in which it upheld the power of the Public Utilities Commission of Illinois with respect to jurisdiction over the local utilities in the city of Chicago. The decision in the case was rendered as the result of an appeal to the Supreme Court from the decision of Judge Thomas Taylor, Jr., of the Circuit Court at Chicago, rendered on May 27, 1916, in which he denied the right of the Public Utilities Commission to issue orders affecting the service and equipment of the Chicago street railways. A formal injunction was entered in the Circuit Court at that time preventing the commission from enforcing its order of Sept. 29, 1915, which was intended to effect service changes. This order by the commission in regard to service was reviewed at length in the ELECTRIC RAILWAY JOURNAL of Oct. 9, 1915, page 775. It was considered unusually drastic.

HOW THE CIRCUIT COURT RULED

The opinion by Judge Taylor stated that the commission's order invaded some of the rights of the company and the city and that consequently it was in violation of their constitutional privileges. In the case before Judge Taylor the question of the constitutionality of the act creating the Public Utility Commission also was raised. On that point the Circuit Court ruled that the State of Illinois had seen fit to pass an act which provided for the regulation of public utilities and held that the act so passed was presumed to be constitutional until it was proved beyond a reasonable doubt to be otherwise. Under the ruling handed down now by the State Supreme Court the only authority reserved to the city is the right to decide what street cars or companies shall operate in its streets and to designate the streets. The opinion, however, is not yet available for publication.

THE ATTITUDE OF THE RAILWAYS AFFECTED

The Chicago Surface Lines was really a third party to the proceedings. Legal action was started by the city of Chicago in October, 1915, in the form of a bill filed in the Circuit Court of Cook County attacking the constitutionality of the public utilities commission law of 1913. Later the Surface Lines intervened in the suit asking for an order which would establish its position clearly as between the jurisdiction of the State Commission and the City Council. On April 20 Leonard A. Busby, president of the Chicago Surface Lines, issued the following statement:

"The effect of the decision of the Supreme Court, as I understand it, is to best in the State Public Utilities Commission all the powers of regulation heretofore vested in the City Council and in the Board of Supervising Engineers, Chicago Traction, under the 1907 ordinances. The effect of the decision is to leave the City Council merely the power to grant the right of operation upon specified streets, the right to purchase the property on certain terms, and the right to share in a certain part of the receipts of the property; but all matters pertaining to regulation of services will be heard and determined solely by the commission. It means that questions relating to routing of cars, type of equipment and regulation of the service, which have heretofore been discussed and passed upon by the City Council, will now be controlled by the State commission."

The decision is expected to throw open again for discussion the question of home rule for Chicago. The committee on judiciary and local transportation of the City Council of Chicago has practically agreed on a bill which is on the calendar at Springfield, the purpose of which is to grant home rule over public utilities within the city limits. This measure is along the lines of the bill rejected by the Legislature last year, but is said to be less objectionable to the neighboring towns and to the steam railroad interests. At the hearing last year it was brought out that the objection to home rule for Chicago was based largely on a fear that within a few years Cook County, in which Chicago is situated, will have a majority representation in the State Legislature, and that the down-State legislators would never consent to give Chicago home rule unless Cook County's representation was greatly reduced. The question before the legislative committee at that time was whether it should recommend that Chicago have a separate commission or confer the power to regulate Chicago utilities upon the City Council.

REHEARING MAY BE ASKED

It is expected that the city will ask for a rehearing by the State Supreme Court. If that is denied appeal may be made to the United States Supreme Court on grounds of constitutionality.

$1,100,000 Car Plant for Coast

Extensive Plant on Twenty Acres Proposed for Pacific Electric Railway in Conjunction with Southern Pacific Railroad

The directors of the Pacific Electric Railway, Los Angeles, Cal., on April 16, voted an appropriation of $1,100,000 for the construction and equipment of car shops at Torrance, 10 miles south of Los Angeles. Later in the week ground was broken on the twenty-acre site upon which will be erected the twenty or more buildings, plans for which are being completed by J. D. Isaacs, consulting engineer for the Harriman Lines, New York City. Upon completion of the preliminary excavation work and the arrival of working drawings from New York, work will be started on the buildings by the construction department of the railway company, under the supervision of M. C. Halsey, 695 Pacific Electric Building.

The larger buildings will be of reinforced concrete, steel and brick. There will be heavy machine shop and paint shop, each 180 x 450 ft., freight car shop, 180 x 400 ft., blacksmith shop, 155 x 200 ft., power house, 60 x 120 ft., dry lumber and iron storage buildings, coal bunkers, scrap bins, offices, etc.

HOW THE PLANT WILL BE USED

With this plant in operation the Pacific Electric Railway will construct not only its own cars but also a part of the cars needed by the Southern Pacific Railroad, it is said. Repair work for the entire interurban system will be done at the new shops. Heretofore this work has been done chiefly at the company's shops at Seventh Street and Central Avenue, Los Angeles, which are now being dismantled to make way for the warehouses and terminal which are being constructed there by the Los Angeles Union Terminal Company.

When the abandorment of the Los Angeles shops was decided on last year the directors of the road laid plans for shops at Torrance, but at that time it was the intention to construct only a part of the buildings under a proposed appropriation of about $500,000. The recent decision to proceed immediately with the construction of the entire plant is said to have been made by the directors in anticipation of the increased demand that it is expected will be made because of the war for additional rolling stock.

Company Agrees to Investigation

Rhode Island Company Accepts Provisions of Legislative Investigation Act—Investigating Committee Prepares to Organize

The Rhode Island Company, Providence, R. I., has officially accepted the provisions of the act recently passed by the General Assembly and signed by the Governor calling for an investigation of the affairs of the company and the affording of financial relief, if such is found just. A certificate signed by Theodore Francis Green, secretary of the corporation, has been filed with the Secretary of State.

The reason for the acceptance being required dates back to the so-called transfer act, which contains a provision that "this law shall not be changed" without the consent of both parties thereto. This has been claimed to be an iron-clad provision which has placed the company outside of jurisdiction in regard to certain fare and transfer matters without its own consent.

It was felt by the lawyers in the Legislature that the company must formally announce its willingness to accept such changes as the special board may recommend, whether favorable or unfavorable to itself, and for that reason the "acceptance" clause was added. It had been suggested in committee that the Rhode Island Company might gladly accept a favorable report by the investigating committee, and abide by its decision, but might reject an unfavorable report, basing its authority to do so upon its alleged inviolable right to agree to all changes.

The members of the investigating committee, all ex officio, will be William C. Bliss, chairman of the Rhode Island Utilities Commission; Zenas W. Bliss, chairman of the Rhode Island tax commission, and George H. Newhall, bank commissioner. The members will organize, probably within a week, and elect a secretary and map out a plan of conducting the investigation.

Baltimore Men in New York

City Officials and Others Inspect Electrified Terminals at New York—Engineers Report

A number of city officials and members of the Chamber of Commerce from Baltimore, Md., spent April 12 and 13 in New York for the purpose of investigating the electric operation of railroad terminals in the latter city. The party, which was accompanied by several local municipal officials and by engineers from the office of Gibbs & Hill, New York, was shown over the Pennsylvania Station and its tunnels under the East and North rivers and then through Sunnyside yard and over the New York Connecting Railway to the electrified Harlem yards of the New York, New Haven & Hartford Railroad. A trip was made over the latter line to the end of the commuting zone at Stamford, and through the Grand Central Terminal which serves the New York end of the New Haven road, as well as the New York Central Railroad. A tugboat in the municipal service was provided to take the party along the west shore of Manhattan Island and thus give an idea of the proposed extensive improvements, including electric operation, for the New York Central's freight tracks and freight yards. The return trip over this route was made by automobile.

The object of the trip was to aid the Baltimore officials in their investigation of the feasibility of electric operation from both operating and financial standpoints, this problem having been under consideration in Baltimore for a number of years. Electrification of the section of the Pennsylvania Railroad which runs through that city has been proposed by several administrations, but in view of the decidedly thin local traffic and the delays that would be caused to through trains because of the need for changing locomotives at each end of a short electric zone, there would be no economy, and probably an increased operating expense, if the tracks through the city were electrically equipped. The expense of equipping such an electric zone would, in addition, be very great, owing to restricted tunnel and yard clearances. Consequently, the railroad company has opposed all plans that look to the establishment of a short electrified zone through Baltimore in advance of the time when it becomes commercially feasible to electrify the entire engine division on which the city is located.

Water Engineer Walter E. Lee reported on April 16 to Mayor Preston on the Pennsylvania Railroad Company's local improvement plans. He said that the real problem was the congestion in the tunnel between the North Avenue bridge and Fulton Junction. He recommended that all passenger traffic from the north and east be handled through existing tunnels; that a freight cut-off start at Bayview Junction and extend over a private right-of-way parallel with and north of Boston Street, and enter a tunnel under the bed of Franklin Street, beginning just west of Calvert Street and extending to Pulaski Street, joining the main line in that neighborhood. Mr. Lee advocated a large terminal freight yard bounded by Central Avenue, Pratt, Bond and Fleet Streets, a territory having entrances from the east, north and west without grades and close to the manufacturing and shipping interests. Reports on the company's plans were also submitted by Harbor Engineer McCay, Chairman Compton of the paving commission and Highway Engineer Cooksey. Electrification was urged by all.

Seattle Conferences Continue

Several Matters Over Which the City and the Puget Sound Company Differ Considered at Meetings

The proposal that the Puget Sound Traction, Light & Power Company, Seattle, Wash., grant universal transfers to Seattle's municipal railway lines, in exchange for a renewal of the franchise for supplying steam heat between Madison and Main Streets and Third Avenue and the waterfront, occupied most of the time in a recent conference between the City Council and the officials of the company. No agreement was reached, and further discussion along this line was postponed until other questions at issue between the city and the company have been threshed out.

The question of granting a renewal of the steam-heating franchise was brought up in a series of conferences being held between the city and the company, in an attempt to arrive at some working agreement that would be mutually satisfactory. City and company officials agreed on every point in the proposed steam franchise, with the exception of the transfer agreement insisted upon by Councilman Oliver T. Erickson.

A. W. Leonard, president of the Puget Sound Traction, Light & Power Company, asked that a money value be placed on the franchise. Councilman Erickson suggested 5 per cent of the amount invested in a steam plant. Mr. Leonard doubted the reasonableness of such a valuation, in view of the fact that the steam plant earned between 3 per cent and 4 per cent on the investment.

The demand made by Councilman Erickson that the company agree to the exchange of transfers between city and company lines, in exchange for the steam-heating franchise, developed a controversy between Mr. Erickson and Councilman R. H. Thomson. The latter pointed out that by this arrangement the city would pay 2½ cents to the company for most of the passengers using the Division "A" line, and the same fee for 300 of 500 passengers carried each day on the Division "C" line. According to Councilman Thomson this would increase the monthly deficit of the municipal line about $3,000, without in any way increasing the revenues. Councilman Erickson insisted that service was what the city wanted, and that revenue was a secondary consideration.

At the conference an extension of the East Union Street line of the company was agreed to by the company. The company has money in its budget for the extension and is awaiting the grant of a franchise to begin work. The question of Twenty-third Avenue service by the company north of Madison Street will be taken up at an early conference. Patrons of this line want the cars which serve that district routed down Madison Street, instead of the present transfer arrangement. The State Utility Commission has ordered the installation of this service, but the company has carried its objection to the order to the Supreme Court.

The question of bridges under construction and proposed, for which the company is expected to contribute, was also taken up at the city traction conference, but with no definite results. The determination of the matter of added cost in providing for street railway traffic in the construction of bridges was referred to A. H. Dimock, city engineer; the company's engineer, and A. L. Valentine, superintendent of public utilities of the city. Representatives of the company present at the conferences were President A. W. Leonard, Vice-President W. H. M'Grath, General Manager A. L. Kempster and General Counsel James B. Howe.

Tacoma Extension Terms Fixed

Review of Principal Provisions of Agreement Under Which Tacoma Railway & Power Company Will Operate Extension to Municipal Line

Final agreement on plans for the construction, equipment and operation of an extension of the Tacoma (Wash.) municipally-owned tideflats street railway to the Todd shipyards was reached at a meeting recently of city, Pierce County, Tacoma Railway & Power Company and Todd shipyard representatives. It is now up to Pierce County to build a road fill-in extending from Eleventh Street to the shipyards, on which the city will lay the street railway tracks.

City Attorney Harmon has been instructed by the Council to draw up a formal agreement, to be signed by the City Commissioners and the Tacoma Railway & Power Company officials. The present agreement for the operation of the Eleventh Street line, now being run by the Tacoma Railway & Power Company for the city of Tacoma, will remain in effect until the completion of the extension. The Tacoma Railway & Power Company has agreed to surrender its present contract with the city in case the city wants to operate the Eleventh Street line itself. This is still a question for the commissioners themselves to answer when the line is built.

The question of transfers was also laid over until completion of the line, although the company stated expressly that if at any time the city desired to enter into a transfer agreement, the company would not accept less than 4 cents on any transfer. This will force the city to charge 5 cents without transfers. While it was tentatively decided at the meeting to charge a straight 5-cent fare each way, the Council reserved the right to raise the fare if that became necessary to guarantee a revenue sufficient to meet the interest on the $165,000 of bonds which will be issued by the city to secure the funds to build the line. The city will also reimburse the Puget Sound Traction, Light & Power Company for the $3,000 deficit which has accumulated in operating the present line. Pierce County will finance the construction of the Eleventh Street fill, where the tracks will be located. This work will cost about $74,000.

Organizing Cincinnati Forces

Rapid Transit Commission Is Arranging Preliminaries for Loop Construction

At a meeting of the Rapid Transit Commission of Cincinnati, Ohio, on April 20, Chief Engineer Frank S. Krug was authorized to submit a general plan of organization at a meeting to be called a few days later. The proposed organization will include the number of engineers, draftsmen and other technical men needed and the number of real estate experts necessary for securing and appraising property to be used as right-of-way for the loop line approved at the recent election. Supervision of the various features of the work will be assigned to committees composed of members of the commission. A secretary and assistant secretary to the commission will also be employed, but candidates for these positions have not yet been considered. Mr. Krug has stated that specifications for the eastern half of the loop will be prepared first. The lease of the Union Gas & Electric Company on a portion of the canal on the west half will not expire until the end of the year. but there is nothing to interfere with the work on the eastern half. Mr. Krug is confident that the engineering work will be completed in time to award construction contracts by Jan. 1, 1918. The headquarters of the commission will be continued in the City Hall.

W. Kesley Schoepf, president of the Cincinnati Traction Company, has suggested to the County Commissioners that the space between the tracks of the Glendale line on the Dixie highway be sodded. He has agreed to move the tracks to the center of the street, in accordance with the wish of the commissioners, and expressed the opinion that the appearance of the highway would be improved by the grass strips. Before the plan can be put into effect the officials of the village of Wyoming will have to relinquish their right to compel the company to pave between the tracks.

Progress of Oakland Resettlement

In March announcement was made of the personnel of the committee appointed by Mayor Irving of Berkeley, Cal., to negotiate with the San Francisco-Oakland Terminal Railways a resettlement of franchises in that city. Mayor Davie of Oakland has now appointed, as a committee to negotiate a resettlement of franchises held by the company in the city of Oakland, in accordance with the application filed on Feb. 27 under the provisions of the recent amendments to the Oakland charter, ex-Governor George C. Pardee, a member of the committee which drafted the resettlement provisions of the Oakland city charter; A. S. McDonald, Percy C. Black, J. W. Stetson, J. H. Boyer, Samuel Hubbard and Dr. R. M. Higgins.

It is assumed that the Oakland and Berkeley committees will meet in the near future for the purpose of organization and study of the details of franchises which would fulfill the conditions of the new charter provisions and attract private capital necessary to provide long-deferred betterments to the tracks and equipment for the transportation system of the East Bay cities

The new charter of the city of Alameda provides for a similar resettlement of franchises in that municipality, and it is expected that a representative committee will shortly be appointed to negotiate a resettlement under conditions permitting a harmony of operation throughout the entire East Bay territory.

Railways Purchase Coal Land

Four Indiana Interurban Railways Plan Active Mining in Their Own Interest

In order to secure immediate shipments of coal, the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis Traction & Terminal Company, Union Traction Company of Indiana and Fort Wayne & Northern Indiana Traction Company, four of the principal electric railway systems in Indiana, have, through the United Tractions Coal Company, purchased the Shirley Hill coal mines, including mine shafts, machinery and buildings, with about 660 acres of coal lands adjoining the 2390 acres of coal lands already owned by the United Tractions Coal Company. The companies have also leased an additional 600 acres of adjoining coal lands, making the total acreage of owned and leased coal lands 3650 acres.

It was with such an idea in mind as has now been put through that the four companies organized and incorporated the United Tractions Coal Company in the year 1903. The capital stock of that company was owned equally by the four traction companies, and through this coal company they acquired and became the owners of 2390 acres of valuable coal lands in Sullivan County, Indiana. The time was not judged propitious for sinking shafts and attempting to mine coal for the needs of the four traction companies until the present year, when the possibility of coal shortages made it desirable that the companies should protect their interests by insuring an ample coal supply for all their power plants.

The first work to be undertaken will be the electrification of the Shirley Hill No. 3 mine at an expense of approximately $30,000. While this mine will not supply the requirements of the plants of the railways until further development work has been done, it is estimated that during the first year about 200,000 tons of coal will be produced from this shaft, and after the electrification work has been completed, the production from this No. 3 mine will be increased to approximately 450,000 tons for the second year. All coal will be shipped from the mine in the usual manner via the steam lines. For the present the electric railways have no plans for the handling of the coal over their own lines.

Transit Muddle in Philadelphia

Philadelphia's transportation plot has certainly thickened. Moves and counter moves, accusations and counter accusations, arguments and refutations have come so fast lately that the trend of events is not always clear even to the active participants. To make all that has happened on the stage and behind the scenes plain would require proficiency in political reporting such as few besides the late Samuel Johnson possesses. Even the Philadelphia *Public Ledger* has deemed it necessary to preface its recent accounts of the transit proceedings with a summary so that the reader shall not be hopelessly lost. Thus on April 20 that paper said:

"Mayor Smith issued a statement defending the bills, which were attacked by A. Merritt Taylor, former director of city transit. Director Twining of the department of city transit attacked the attitude of Mr. Taylor. Mr. Taylor, in a statement, insisted that the bill before the Legislature which he had termed 'destructive' was different from that which he sponsored while director. Mr. Fluck issued a statement explaining his motives. Concerning the suit, Director Twining said: 'We shall continue our work until stopped by order of the court.'"

The summary just quoted represents one day's budget of news. Occasionally it seems as if the whole "fifteen decisive battles of the world" were in progress in Philadelphia at the same time.

A definite step at least was taken on April 24 in connection with the transit matters. On that day a decision was reached at Harrisburg to hold a hearing on the matter in that city on May 8. The measure to be considered is the Salus bill, which has been recommitted to the Senate committee on judiciary general. This decision was reached after a conference in the Senate chamber between Mayor Smith, Transit Director Twining, Senator McNichol, Joseph P. Gaffney, who is chairman of the finance committee of Philadelphia Councils, and Senator Kline, who is chairman of the Senate judiciary general committee. An effort will be made to combine all transit legislation now pending under one bill which will be satisfactory to all factions.

Franchise Act Attacked

The validity of the Voorhees franchise act is attacked in the appeal filed by the Trenton & Mercer County Traction Corporation, Trenton, N. J., with the State Board of Taxes and Assessment. On the gross receipts of all the electric railways the State collects 5 per cent and prorates this to the municipalities through which the companies operate. The figures are furnished by the roads themselves. The appeal of the Trenton line, however, declares that the assessment and apportionment are in excess of true value and not made within the time limited by law. Other technical requirements are also asserted to have been neglected. The company maintains that it is overcharged $1,000,000 on the assessment levied on it and made this statement through President Rankin Johnson at the hearing before the State board recently.

The constitution, it is alleged, has been violated under Par. 12 of Sec. 7, because the franchise is property and was not assessed for taxes by uniform rules as is the property of other utility corporations and persons. No proper relation for purposes of taxation, it is asserted, existed between the gross receipts of the company and the value of property taxed. This appeal was first made to the county board, but was set aside on the ground that jurisdiction was lacking.

In the session of the Legislature just closed, a statute was passed to increase the franchise tax on gas, electric, water and other utilities until, like that on the electric railways, it totals 5 per cent. The last distribution throughout the State from the electric railways was $797,088, and of this $63,498 went to Mercer County.

The State Board of Taxes and Assessment has dismissed the application of the Trenton & Mercer County Traction Corporation against the assessment of a franchise tax levied by the board, amounting to $31,345. The board held that it had no jurisdiction in the appeal. The company has not yet paid the taxes levied for the year 1916 and asked that they be set aside or reduced.

Women Car Cleaners.—Owing to the scarcity of workmen in Toledo, Ohio, the Toledo Railways & Light Company has advertised for women to scrub its street cars.

I. R. T. Employees to Hit the Trail.—The Interborough Rapid Transit Company, New York, N. Y., has requested 5000 seats for its employees to attend the Billy Sunday revival services in the tabernacle during the week commencing April 30.

Convention of Amalgamated.—The Amalgamated Association of Street & Electric Railway Employees of America will meet in Providence, R. I., on Sept. 10. This meeting will be the fifteenth biennial convention of the association. The meeting in 1915 was held in Rochester.

Michigan Utilities Bill Passes Senate.—The public utilities bill proposed for the State of Michigan, amended so as to make the commission four instead of three members, has passed the Senate of that State. Its companion bill, to fix the home rule law so that the telephone control can be vested in the city, has also been passed.

Assessment Method Advocated for Chicago Subway Construction.—Mayor Thompson of Chicago, Ill., has recommended to the City Council immediate construction of subways by special assessment as a "simple and reasonable solution" of Chicago's traction problem. His proposal was submitted in a special message of 2500 words.

To Make Its Own Asphalt Repairs.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., has erected an asphalt repair plant at its carhouse in South Trenton and will shortly begin repairing its portion of the asphalt streets. Formerly the work was done by contractors or the city and charged to the railway. The company claims that it can do the work more cheaply.

Trials of Conductors in May or June.—The cases of the conductors in the employ of the Atlantic City & Shore Railroad, Atlantic City, N. J., who, as noted recently in the ELECTRIC RAILWAY JOURNAL, are under indictment for conspiracy to defraud the company will not come up for trial until either the May or June term of court. A conductor apprehended previously on a similar charge was sentenced to serve six months in the county jail.

Labor Differences Settled.—The London (Ont.) Street Railway's offer to recognize the recently organized union, and to grant a number of concessions, has been accepted by the employees. The men did not get all they asked, but the agreement, which is for a year, grants among other things an increase in wages of 2 cents an hour, half the cost of uniforms, one day a week off duty, and a down-town office. The company reserves the right to treat with any committee of employees.

Mayor Vetoes Experience Ordinance.—The City Council of Rockford, Ill., recently adopted by a ten to five vote an ordinance that no conductor or motorman may be employed who has not had at least fifteen days' experience at the hands of another motorman or conductor who has had at least two years' experience duly certified by a license. Mayor Bennett promptly vetoed the measure. He characterized the ordinance as "a tendency to prescribe, legislate and circumscribe public utilities."

Nine-in-Eleven-Hour Bill Fails.—After the first hearing on the so-called nine-in-eleven hour bill, which was introduced into the Maine Legislature this year, the measure was amended so that a day's work for motormen and conductors should be nine hours, to be completed within twelve consecutive hours instead of eleven consecutive hours. This amended bill also provided for drastic penalties to be paid by corporations or individuals controlling street railways for violations of the provisions of the act. The measure failed of passage.

Strike Broken.—The strike of the employees of the West Chester, Kennett & Wilmington Electric Railway, referred to briefly in the ELECTRIC RAILWAY JOURNAL of April 7, page 660, has been broken. Service was suspended for five days while the company was perfecting its new organization. The men demanded an increase in wages of 4 cents an hour over the scale of 21 and 22 cents which was in force. The company declared its willingness to grant an increase of 2 cents an hour and a number of the old men accepted these terms.

Ottawa Men Protest Labor Rulings.—The employees of the Ottawa (Ont.) Electric Railway have appealed to the officers of the company from alleged wrongful interpretations of the terms of the agreement covering conditions of service which was entered into between the company and the men and was intended clearly to define the status of each of the parties to the contract. The men contend that recent changes in the heads of departments, made necessary under the war conditions, have resulted in decisions being made unfair to the men by persons unacquainted with the spirit of the contract.

Chicago's Traction Fund $21,500,000.—The payments made on April 10 to the city of Chicago, Ill., by the Chicago City Railway, the Chicago Railways and the Southern Street Railway, under the terms of the 1907 settlement ordinances, aggregated $2,746,988. The period represented was the fiscal year ended Jan. 31, 1917. The increase over the previous year was $1,081,178. The settlement for the year ended Jan. 31, 1917, was divided as follows: Chicago Railways, $1,769,460; Chicago City Railway, $881,332; Southern Street Railway, $96,196. In the ten years since the franchise was granted the payments to the city have totaled about $21,500,000.

Utility Law Amended.—Governor Gunter of Colorado has signed the bill amending the public utility commission law which gives the commission power to refuse permits for competitive utilities in any district where proper service at reasonable rates is being rendered by an existing utility. The bill also provides that where a municipality desires to acquire any privately-owned utility it must make application to the commission, which will fix the value of the utility and submit the question of purchase at such price at a special election in the municipality. The latter provision gives the commission jurisdiction over the attempt of the city of Denver to acquire the plant of the Denver Water Company.

Bills Affecting Illinois Utilities.—House bill No. 465, introduced into the Illinois Legislature, contains provisions under whch any street railway would be permitted to surrender its present franchise for an indeterminate permit. These provisions are identical with the Wisconsin indeterminate franchise act. House bill 466 is an amendment to a law under which cities are now permitted to own and operate their own utilities. As the law now stands cities may engage in the operation of such utilities without hindrance from the State Public Utilities Commission. House bill No. 466, if enacted into law, would require every city, before engaging in a public utilities business, to secure a certificate of convenience and necessity from the State Public Utilities Commission.

Illinois Traction System to Take Up Forestation.—The Illinois Traction System has arranged to set out 30,000 catalpa trees from 18 in. to 24 in. in height at points along the right-of-way where there is considerable acreage and where the trees will not obstruct the view. At a point near Lincoln, Ill., about 5 acres of ground have already been plowed and made ready for planting. A similar plat will be set out north of Benld and other smaller patches between Springfield and Champaign. These trees are of the Speciosa variety, which if cultivated and trimmed each year can be cut and made into good fence posts in eight years, and quickly grow in a few years more into size suitable for cutting ties. The trees cost about $15 per thousand.

Another Rapid Transit Link Opened.—The new Corona elevated extension, one of the rapid-transit lines of the dual system in New York City, was placed in operation on April 21. It is 4¼ miles in length and will add 12.6 track-miles to the 115 track-miles of the dual system now in operation. In all there will be 345 track-miles in the dual system. The Corona extension is a three-track elevated structure for its entire length and will connect with the other Queens lines at the New Queensboro Bridge Plaza station. Exercises in which various city officials, officials of the Interborough Rapid Transit Company, which will operate the line, and members of the Public Service Commission for the First District participated were held on the afternoon of April 21, following the operation of the first train from New York to the eastern terminus of the line at Alburtis Avenue.

Programs of Association Meetings

Iowa Electric Railway Association

The annual convention of the Iowa Electric Railway Association will be held at Des Moines, Iowa, on May 24 and 25.

New York Electric Railway Association

The annual meeting of the New York Electric Railway Association will be held at Bluff Point, N. Y., on June 26 and 27. The program of papers has not yet been arranged.

Oklahoma Gas, Electric & Street Railway Association

The sixth annual convention of the Oklahoma Gas, Electric & Street Railway Association will be held at the Lee Huckins Hotel, Oklahoma City, on May 10, 11 and 12. There are to be three papers on plant operation: (1) Small plant operating problems, (2) ice and electric plant operation, (3) street railway plants and outdoor substations. There will also be a paper on Oklahoma fuels and one on meters and services. There will also be one question box session.

The program of entertainment arranged for the evenings is as follows: May 10, luncheon and cabaret; May 11, association banquet; May 12, joviation and rejuvenation.

Several important matters of public policy will also be discussed.

Central Electric Railway Association

The boat trip of the Central Electric Railway Association will be held on June 22 to 25. The steamship *South American* will leave Toledo on June 22 at 10 a. m., stopping at Detroit for passengers, sailing to Owen Sound and through Georgian Bay, returning to Toledo at 10 a. m. on June 25. Members of the association and guests are entitled to take the trip. Guests are considered to be personal friends of members who are not employees of any electric railway; any railway official or employee who does not belong in the territory covered by the association or who does not belong to the association in any way, although located in the territory, who would be interested in attending the meeting; officials and office employees of manufacturing and jobbing firms who do not "travel" in any territory, but whose territorial representative is a member of the association; supply men who do not travel in the States of Indiana, Illinois, Ohio, Kentucky, Pennsylvania, West Virginia and Michigan.

The association is extremely anxious to have all of its personal friends meet its business friends and wants railway officials who are not members of the association to become interested and see the advantages of the organization. It also desires the officials of manufacturing and jobbing companies who of necessity cannot join the association, but who are interested in its welfare, to enjoy the trip. Any supply man who travels the territory of the association and is not a member will not, however, be sold a ticket for the trip, unless his request is accompanied by an application for membership and check for $8.

The steamship *South American* will accommodate 584 passengers. Those who apply early will receive the preference in the assignment of staterooms. Each stateroom will accommodate two people and it is desired that those who make application for reservation shall name their own roommate. Regular application forms will be furnished later.

Application must be accompanied by a check before reservation will be made. The ticket will contain the name of the holder and number of the stateroom assigned. This is required by maritime laws. Those who invite guests should make application for tickets for those guests, as tickets will only be issued to members of the association. The rate of fare will be $20 for each person for the round trip One-half fare will be charged for children from two to twelve years of age. The fare includes stateroom, meals and entertainment. All applications for tickets should be mailed to the Central Electric Railway Association, 308 Traction Terminal Building, Indianapolis, Ind. All checks in payment for tickets should be made out to W. H. Bloss, chairman. Reservations for tickets must be made before May 26.

Financial and Corporate

Future of the Bond Market

J. H. Briggs, assistant manager of the bond department of H. M. Byllesby & Company, Chicago, Ill., has issued the following letter to salesmen:

"Since the formal declaration of war the investor has practically dropped out of the market and trading has been confined largely to the professional element. You no doubt have been discouraged by lack of ready response to your offerings and by the pessimistic attitude assumed by the public in general. Casting about for rays of hope in what might be termed a dark period of our history, we are prone to make comparisons of present conditions with those of the past. Somewhat more than fifty years ago our country passed through its most critical period—the Civil War—and it is interesting to note the action of the bond market during that crisis.

"The bulletin of Moody's Investors Service (a copy of which was inclosed) reflects market conditions of that period as relating to bonds and shows the rapid rise in bond prices during the war and reconstruction period. This rise in price, of course, was due to abnormal profits derived from war industries, which brought on a consequential demand for investments.

"We are now entering into a similar period, but with our financial strength and credit at its highest point and our sources unimpaired by the disasters which have overtaken all of the larger nations. Surely, conditions are all in our favor.

"There is no doubt but that the new war loan will be a success and it seems only necessary for the proceeds of this loan to be distributed among the industries of the United States to insure the success of the bond market. It is unquestionable that the bulk of the proceeds of this loan will be spent in the United States and all lines of industry directly affected by the war must expand, and expansion in those lines will necessarily produce expansion in hundreds of other industries directly dependent upon the first for their livelihood. It is only a question of time when the surplus profits will be employed in the bond market in the form of stable investments.

"The tax problem at the present date is an uncertainty and by reason of its uncertainty has caused the investor to delay his investments, in order to choose wisely with least loss to himself. It is inconceivable that a tax sufficient to cover the full loan can be assessed during the life of the war. Such an action no doubt would paralyze the business of the country. We believe that taxes will adjust themselves to harmonize with other prevailing conditions. Financial markets will respond to an unsurpassed industrial and agricultural production. Reassure your customers."

Annual Reports

Cities Service Company

The comparative income statement of the Cities Service Company, New York, N. Y., for the years ended Dec. 31, 1915 and 1916, follows:

	1916	1915	Increase Per Cent
Gross earnings	$10,110,342	$4,479,800	125.6
Expenses	239,389	172,856	38.4
Net earnings	$9,870,953	$4,306,944	129.1
Interest on notes and debentures	258,960	490,000	*47.1
Net to stock	$9,611,993	$3,816,944	151.8
Dividends preferred stock	2,409,691	1,570,005	53.4
Net to common stock and reserves	$7,202,302	$2,246,939	220.5

*Decrease.

The 1916 report thus shows great progress as compared with 1915, which had been the most prosperous in the history of the company. During the last six years the gross earnings grew from $965,876 in 1911 to $10,110,343 last year, and the net earnings to common stock and reserves from $400,645 to $7,202,302. The greatest amount of increase took place during the year just closed—largely due to developments in the oil properties. Gross earnings to the Cities Service Company from oil production and refining operations for 1916 were $4,537,227, as compared with $213,788 in the preceding year.

The report contains no detailed operating figures for the various electric, gas, railway and other subsidiaries. It is stated generally that the gross receipts of the railway properties increased considerably and the additional traffic necessitated the purchase of more than sixty cars during the year. The passenger total of 111,192,573 in 1916 represents, according to a memorandum to investment bankers, an increase of 6,250,133.

Southern Pacific Company—Affiliated Electric Lines

The results of the activities of the affiliated electric lines of the Southern Pacific Company for the year ended June 30, 1916, are shown in the accompanying table. The total loss reported in the preceding year was $1,444,117, but with the elimination of the Portland, Eugene & Eastern Railway, which because of being absorbed by the parent company is not included in the table this year, the 1915 loss was $1,037,102. The 1916 loss of the remaining companies, or $1,253,309, represented an increase in deficit of $216,207, or 20.8 per cent.

This loss was made up of a decrease of $33,254 in the net income of the Stockton Electric Railroad, and increases in deficits for all the other lines, as follows: Pacific Electric Railway, $138,213; Fresno Traction Company and Fresno City Railway (combined), $3,022; Visalia Electric Railroad, $11,898; San José Railroads, $16,929, and Peninsular Railway, $12,892.

For these companies the combined railway operating revenues showed a falling off of $40,028, or 0.4 per cent. This

FINANCIAL AND OPERATING STATISTICS OF AFFILIATED ELECTRIC RAILWAYS OF SOUTHERN PACIFIC COMPANY FOR YEAR ENDED JUNE 30, 1916

	Total	Pacific Electric Railway	Fresno Traction Company and Fresno City Railway (Combined)	Stockton Electric Railroad	Visalia Electric Railroad	San José Railroads	Peninsular Railway
Railway operating revenues	$10,003,715	$8,856,796	$227,394	$221,296	$83,889	$329,531	$284,807
Railway operating expenses	6,923,159	5,994,611	166,742	178,789	78,831	239,929	264,257
Net revenue—railway operations	$3,080,556	$2,862,185	$60,652	$42,507	$5,058	$89,602	$20,550
Taxes assignable to railway operations	584,001	515,556	14,130	11,399	5,094	20,619	17,202
Operating income	$2,496,554	$2,346,629	$46,522	$31,108	*$36	$68,983	$3,348
Non-operating income	101,681	†37,301	26,602	1,425	145	3,830	32,377
Gross income	$2,598,235	$2,383,930	$73,124	$32,532	$109	$72,813	$35,726
Deductions from gross income	3,851,544	3,205,664	106,612	11,361	94,304	165,455	268,147
Net income (or loss)	*$1,253,309	*$821,734	*$33,488	$21,172	*$94,195	*$92,641	*$232,421
Tons of commercial freight carried	2,532,348	2,532,348	§	§	‡	§	‡
Passengers carried—revenue	96,602,789	75,408,265	5,099,106	5,116,406	109,353	8,045,294	2,824,365
Car miles—transportation service	36,584,206	30,807,115	1,355,106	1,270,087	213,680	1,841,028	1,097,190
Total single-track mileage	1,301.66	1,058.95	45.01	25.51	49.11	42.69	80.39

*Loss. †Does not include interest amounting to $391,153 accrued during the year, on advances to the Pacific Electric Land Company. §These lines do not carry freight. ‡Figures not available.

was met by a decrease in operating expenses only to the extent of $15,564, or 0.2 per cent. Taxes assignable to railway operations rose $25,086, or 4.5 per cent, and although the non-operating income increased a few thousands, the deductions from income rose $170,134, or 4.6 per cent. Consequently the net figure for the year showed the loss before stated.

In the case of the Pacific Electric Railway, the largest affiliated company, the operating revenues lost $17,711, or about 0.2 per cent, while the operating expenses decreased $32,191, or about 0.6 per cent. Taxes, however, rose $9,079, or about 2 per cent, and income deductions $177,215, or about 5 per cent.

All of the affiliated lines showed decreases in railway operating revenues with the exception of the Stockton Electric Railroad, which gained $21,169. In this case, however, the operating expenses rose $48,825, so that the net from railway operations showed a decrease of $27,657. With the further exception of the Peninsular Railway, whose expenses increased very slightly, the other lines all had lower operating expenses. The taxes in all cases increased, and the income deductions as well.

The total number of revenue passengers carried by all the lines fell off from 97,529,788 to 96,602,789. The tons of commercial freight carried, however, rose from 2,251,342 to 2,532,348, all this gain being on the Pacific Electric Railway. The car-miles in transportation service decreased from 37,145,814 to 36,584,206.

Duluth-Superior Traction Company

The comparative income statement of the Duluth-Superior Traction Company, Duluth, Minn., for the calendar years 1915 and 1916 follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Railway operating revenues:				
Revenue from transportation	$1,398,712	99.37	$1,154,906	99.18
Revenue from other railway operations	8,799	0.63	9,539	0.82
Total	$1,407,511	100.00	$1,164,445	100.00
Railway operating expenses:				
Way and structures	$166,197	11.81	$140,953	12.11
Equipment	91,571	6.50	90,586	7.79
Power	171,473	12.18	155,617	13.36
Conducting transportation	348,939	24.79	308,481	26.48
Traffic	813	0.06	254	0.02
General and miscellaneous	137,720	9.79	145,787	12.52
Transportation for investment-credit	—2,140	—0.15	—672	—0.06
Total	$914,573	64.98	$841,008	72.22
Net revenue from railway operation	$492,938	35.02	$323,437	27.78
Taxes assignable to railway operation	69,512	4.94	69,831	6.00
Operating income	$423,425	30.08	$253,606	21.78
Non-operating income	16,917	1.20	15,515	1.33
Gross income	$440,342	31.28	$269,121	23.11
Deduction from gross income	172,341	12.24	172,699	14.83
Net income	$268,001	19.04	$96,422	8.28

During the last year the 1915 losses in revenue owing to jitney competition and other causes were fully made up. The 1915 loss of $135,011, or 10.4 per cent, in revenue from transportation was turned in 1916 into a gain of $243,806, or 21.1 per cent. Operating expenses in the last year rose $73,565, owing mostly to increased expenses for maintenance of way and structures, power and conducting transportation. The net revenue from railway operation, however, gained $169,501, or 52.4 per cent.

Taxes and income deductions showed slight decreases, while non-operating income rose a little. As a result the net income was not far from tripled, the gain being from $96,422 in 1915 to $268,001 in 1916. Thus the net income for the last year more than recovered the loss from the figure of $209,680 in 1914. The company in 1916 earned 5.94 per cent on its common stock, as compared to 1.04 in 1915, but paid nothing in dividends as compared to 1 per cent in 1915.

During 1916 depreciation to the amount of $138,561 was charged off and included in operating expenses. Expenditures for additions to property, aggregating $228,116, were made. Important improvements and reconstruction of a large portion of the company's tracks were completed during the year. There was expended for renewals the sum of $77,235. During the year two voluntary increases in the rate of pay of the company's employees were made.

The cash position of the company was greatly strengthened in 1916. The current liabilities were reduced during the year from $293,571 to $143,488. The current assets on Dec. 31, 1916, were $215,159, as compared to $159,374 the year before.

Committee on Intercorporate Relations

The board of directors of the New York, New Haven & Hartford Railroad on April 24 created a committee of intercorporate relations, which is to consist of the presidents and vice-presidents of the various companies comprising the New Haven system. Howard Elliott, who resigned that day from the presidency of the company, is to be chairman of this committee, and will work with the various presidents to co-ordinate and harmonize the activities of the companies. E. J. Pearson, who has been vice-president of the company since March 9, 1916, has been elected president to succeed Mr. Elliott. Mr. Elliott will continue as a director.

Modified Reorganization Plan Adopted

Reduction in Capitalization of United Railroads, San Francisco, by $37,628,000 Approved by Reorganization Committees

The amended plan of reorganization of the United Railroads, San Francisco, Cal., has been adopted by both the New York and the San Francisco committees. Prior to the announcement of the amended plan nearly 80 per cent of the bonds had already been deposited with the two committees. The total capitalization is reduced from $84,639,100 to $47,011,100.

The plan provides: First, for the cash requirement of $5,200,000 to take care of underlying bonds overdue and to mature April 1, 1918; second, for the exchange of the present 4 per cent bonds for new securities, consisting of 66 2/3 per cent of the holdings in new 6 per cent bonds, 8 1/3 per cent in first preferred stock and 33 per cent in new common stock; third, for the retirement of $45,873,000 in outstanding notes, preferred stock and common stock, by an issue of $12,244,000 of new second preferred and common stock, and fourth, for saleable securities to take care of the company's future capital requirements.

The $5,200,000 cash requirement is provided for as follows: $2,200,000 by the use of income accumulated pending reorganization and the sale of some non-operative property and $3,000,000 by the sale of Market Street Railway 5 per cent bonds. This leaves the Market Street Railway 5 per cent bonds as the only underlying bonds and reduces the total underlying amount to $10,098,000. Under the terms of the Market Street Railway mortgage, $3,909,000 is reserved for future improvements.

For all the junior issues the plan provides $6,000,000 of second preferred stock and $6,244,000 of common stock. In addition, the junior security holders are required to purchase $3,000,000 of Market Street Railway 5 per cent bonds, to be issued to retire underlying bonds at par, for $3,000,000 cash.

The fixed interest on the new 6 per cent bonds is exactly equal to the 4 per cent interest on the par of the present bonds, and the interest return to the bondholders is left unchanged. The total interest bearing debt of the company is reduced by the plan $12,959,000. The total annual obligatory charges are reduced $343,890. The total annual interest charges under the new plan will be $1,444,860.

The time for the deposit of bonds under the amended plan has been extended until May 26. The San Francisco committee has fixed upon $5 a bond as a fair contribution toward defraying the expenses of the committee. The New York committee has announced that the expenses and compensation of the committee will be provided for under the amended plan without cost to certificate holders that assent to the plan.

Suburban Line Purchase Proposed

Orleans-Kenner Electric Railway May Be Acquired in the Interest of the New Orleans Railway & Light Company

Francis T. Horner of Bertron, Griscom & Company, New York, N. Y., who is president of the American Cities Company, which controls the New Orleans Railway & Light Company, has issued a statement which indicates a possible closer relationship between the American Cities Company and the Orleans-Kenner Electric Railway, operating 11.6 miles of line out of New Orleans. He said in part:

"Nearly one and a half years ago Harry K. Johnson advised me that he could not secure the needed financial support to complete the Orleans-Kenner Electric Railway in accordance with the requirements of his franchise and asked whether or not my firm would loan him a sum of money with a view ultimately, if it appeared wise to us, to finance his proposition. Solely by reason of my firm's interest in the New Orleans Railway & Light Company and the belief that the interurban line would attract business to New Orleans we advanced money for the requirements of the company in an amount exceeding $100,000.

"We expect to purchase the bonds of the Orleans-Kenner Electric Railway and the controlling interest in its stock. The New Orleans Railway & Light Company has agreed that at a minimum cost of supervision it will for a year or two handle the operation so as to give the property an opportunity to become self-supporting. If the people of Jefferson Parish feel that this course of procedure is detrimental to their interests we will sell to them the bonds and stock at cost to us, plus a reasonable compensation for our time and labor, and provided further they furnish assurance—first, that they will provide the money necessary to put the road in at least as good an operating condition as the present owners and my firm contemplate, and, second, protect the road against the risk of financial disaster or receivership for a reasonable period of time until its earning capacity has been developed and demonstrated. There is neither mystery nor concealment about the transaction."

Norfolk & Ocean View Line Dissolved

Without Funds and with Accumulated Deficit of $328,000—Company's Difficulties Accentuated by Jitney Competition and Increasing Costs

The Norfolk & Ocean View Railway, Norfolk, Va., has been dissolved in accordance with the laws of the State of Virginia and its corporate existence terminated. Prior to its dissolution, the company conveyed its lines in Norfolk County to Ocean View to the Virginia Railway & Power Company, which will operate cars on the lines into the city of Norfolk over the Colonial Place line and the Norfolk & Atlantic Terminal line to City Hall Avenue. The operation of the lines of the Norfolk & Ocean View Railway were discontinued at midnight on April 5 by order of the trustees in liquidation. All tickets issued by the company and now in the hands of the public will be accepted on the Norfolk & Atlantic Terminal line and on the River View line of the Virginia Railway & Power Company or will be redeemed by the trustees in liquidation.

T. Norman Jones, Jr., agent for the trustees in liquidation, who is also assistant general manager of the Virginia Railway & Power Company at Norfolk, Va., in a statement which he made to the public, said in part:

"The company regrets the necessity for the abandonment of the operation of its lines and the termination of its corporate existence. It has been operating for ten years and in that time has accumulated a deficit of $328,000. It is without funds to continue operation and as this line has failed to earn operating expenses and depreciation, to say nothing of interest on the capital invested, the board of directors of the company were unable to provide money to continue to meet its increasing expenses. Its difficulties in this regard have been greatly accentuated by the recent jitney competition and the heavy increase in the cost of materials and other operating expenses, and since it was no longer able to comply with its franchise obligations, there was nothing left for the board of directors to do but to abandon the undertaking and terminate the corporate existence of the company in the manner prescribed by law."

Bucks County Interurban Railway, Newtown, Pa.—The Pennsylvania Public Service Commission has authorized the Bucks County Interurban Railway to purchase the stock of the Trenton City Bridge Company and the Pennsylvania-New Jersey Electric Company.

Cities Service Company, New York, N. Y.—The newly-elected board of directors of the Cities Service Company met and organized on April 20. E. H. Johnston was elected a vice-president to succeed Charles T. Brown. The other officers were re-elected. An executive committee was appointed, consisting of Henry L. Doherty, Frank W. Frueauff, Warren W. Foster, Leslie M. Shaw, G. B. Tremaine, H. H. Scott and M. R. Bump. Henry L. Doherty, the president, appointed Warren W. Foster, F. S. Terry and Frank W. Frueauff a committee of three to take up and consider the matter of changing the par value of the company's stock and consider the advisability of making application for listing the company's securities on the New York Stock Exchange, with the request that the committee make its recommendations not later than the June meeting of the board of directors.

Havana Electric Railway, Light & Power Company, Havana, Cuba.—A special meeting of the stockholders of the Havana Electric Railway, Light & Power Company will be held on May 17 to take action on the resolution passed by the directors declaring that it is advisable to increase the capital stock of the company from $30,000,000, divided into 300,000 shares of the par value of $100 each, of which $15,000,000 is preferred stock and $15,000,000 is common stock, to $36,000,000, divided into 360,000 shares of the par value of $100 each, this increase of 60,000 shares to be preferred stock having the same preferences, qualifications and restrictions as the preferred stock set forth in the original certificate of incorporation, and to fix the price, terms and conditions upon which the increase of capital stock is to be offered to the stockholders for subscription.

Jefferson County Traction Company, Beaumont, Tex.—A merger is proposed of the properties of the Beaumont Traction Company, the Beaumont Electric Light & Power Company and the Jefferson County Traction Company, all controlled by the Eastern Texas Electric Company. According to the proposal the Jefferson County Traction Company will take over the properties of the other concerns. In order to put this plan into effect it is necessary that the people of the city pass upon the matter by ballot. The reason for the merger is the saving in operating cost made possible by such an arrangement.

London & Lake Erie Railway & Transportation Company, London, Ont.—The London & Lake Erie Railway & Transportation Company has offered to sell the portion of its line between St. Thomas and Port Stanley, 8 miles, together with four cars, for $168,000. The contention of the officials of the road, which is meeting with severe competition from the London & Port Stanley Railway, a municipal line, is that this portion of the road operated as a freight and passenger line in connection with the city's line would pay, even if in direct competition with the London & Port Stanley road.

New England Investment & Security Company, Springfield, Mass.—In a circular issued to the preferred shareholders of the New England Investment & Security Company, the preferred shareholders' protective committee of that company describes a plan for preserving the value of the preferred shares, while at the same time meeting the interest charges on the $13,709,000 of coupon notes due on April 1, 1924, by an exchange of the preferred shares of the New England Investment & Security Company, for the newly authorized first preferred stock of the Worcester Consolidated Street Railway, controlled by the Investment Company. To allow such a plan of readjustment the recent authorization by the Massachusetts Public Service Commission of an issue of 45,000 shares of preferred stock of the Worcester Consolidated Street Railway was sought and obtained. The preferred shareholders' committee hopes to be able to offer 40,000 shares of this stock as of July 1, 1917, to the preferred shareholders of the New England Investment & Security Company, in exchange for their holdings, share for share.

New York (N. Y.) Railways.—An application has been filed with the Public Service Commission for the First District of New York by the New York Railways for permission to purchase 6842 shares of stock of the Bleecker Street & Fulton Ferry Railroad at $28.50 each. The remainder of the 9000 shares will be bought at the same price if the owners will deposit them with the Union Trust Company. The Bleecker Street & Fulton Ferry Railroad was organized about 1864 and was authorized to construct a surface road in Fourteenth Street and other streets and avenues. In January, 1876, the company was leased to the Twenty-third Street Railway for ninety-nine years. This lease was in turn assigned to the Metropolitan Street Railway, which has been succeeded by the New York Railways.

New Orleans Railway & Light Company, New Orleans, La.—Frank B. Williams has been elected a director of the New Orleans Railway & Light Company to succeed Hugh McCloskey, who resigned recently as president of the American Cities Company, which controls the New Orleans Railway & Light Company.

Reading Transit & Light Company, Reading, Pa.—The Pennsylvania Public Service Commission on April 19 approved the application of the Reading Transit & Light Company to purchase stock of a number of railway and light companies in Berks and Lebanon Counties now operated by it under lease. The plan is to simplify the intercorporate relations of the companies by consolidating them, and is a step in the direction of preparing for the further development of the street railway and electric power service in Reading and the Lebanon Valley, in accordance with the plan noted in the ELECTRIC RAILWAY JOURNAL of Feb. 10, page 267.

Twenty-eighth & Twenty-ninth Streets Crosstown Railroad, New York, N. Y.—A payment of $65 per $1,000 bond has been authorized by the bondholders' committee to holders of the certificates of deposit of the Central Trust Company for the first mortgage 5 per cent bonds of the Twenty-eighth & Twenty-ninth Streets Crosstown Railroad. Payment will be made on and after April 24 at the office of the Central Trust Company in New York. The Twenty-eighth & Twenty-ninth Streets Crosstown Railroad was succeeded by the Mid-Crosstown Railway, which is now included in the system of the Third Avenue Railway.

West India Electric Company, Ltd., Kingston, Jamaica.—The gross receipts of the West India Electric Company, Ltd., for the calendar year 1916 amounted to $286,321, an increase of $12,004, or 4.37 per cent over those of 1915. Of this total $195,602 came from the railway department. The receipts in this group showed a marked recovery, although $11,267 below those of 1914. With normal conditions prevailing, it is expected that the traffic receipts will again reach the maximum figure. The operating expenses in 1916 totaled $144,064, this being an increase of $696, or 0.48 per cent. On account of the greater increase in receipts, the operating ratio was only 50.31 in 1916 as compared with 52.26 in 1915. The net earnings at $142.257 represented an increase of $11,307, or 8.63 per cent. The passengers carried in 1916 totaled 4,812,754, a gain of 321,926, or 7.16 per cent.

Dividends Declared

Cape Breton Electric Company, Ltd., Sydney, N. S., Can., 3 per cent, preferred; 1½ per cent, common.

Cities Service Company, New York, N. Y., monthly, one-half of 1 per cent, common and preferred; one-half of 1 per cent, common, payable in common stock.

Columbus Railway, Power & Light Company, Columbus, Ohio, quarterly, 1¼ per cent, preferred, Series B; quarterly, 1¼ per cent, common.

East St. Louis & Suburban Company, East St. Louis, Ill., quarterly, three-quarters of 1 per cent, preferred.

Grand Rapids (Mich.) Railway, quarterly, 1¼ per cent, preferred.

Havana Electric Railway, Light & Power Company, Havana, Cuba, 3 per cent, preferred; 3 per cent, common.

Kentucky Securities Corporation, Lexington, Ky., quarterly, 1½ per cent, preferred.

Lehigh Valley Transit Company, Allentown, Pa., quarterly, 62½ cents, preferred.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., quarterly, 1½ per cent, preferred.

Monongahela Valley Traction Company, Fairmont, W. Va., quarterly, 1¼ per cent, preferred.

Montreal (Que.) Tramways, 2½ per cent, quarterly.

Northern Ohio Traction & Light Company, Akron, Ohio, quarterly, 1½ per cent, preferred.

Pacific Gas & Electric Company, San Francisco, Cal., quarterly, 1¼ per cent, common.

Scioto Valley Traction Company, Columbus, Ohio, quarterly, 1¼ per cent, first preferred; quarterly, 1¼ per cent, preferred.

South Carolina Light, Power & Railways Company, Spartanburg, S. C., quarterly, 1½ per cent, preferred.

Tampa (Fla.) Electric Company, quarterly, 2½ per cent.

Electric Railway Monthly Earnings

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.						
1m., Feb.,	'17	$7,714	*$8,711	†$995	$1,161	†$2,156
1 " "	'16	7,281	*7,720	†439	1,094	†1,533
12 " "	'17	123,986	*112,804	11,182	13,379	†2,197
12 " "	'16	116,877	*97,005	19,872	13,420	6,452
CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.						
1m., Feb.,	'17	$32,010	*$19,445	$12,565	$6,552	$6,013
1 " "	'16	28,638	*18,579	10,059	6,424	3,635
12 " "	'17	401,499	*236,151	165,348	78,451	86,897
12 " "	'16	367,479	*211,355	156,124	78,872	77,252
COLUMBUS (GA.) ELECTRIC COMPANY						
1m., Feb.,	'17	$80,987	*$30,744	$50,243	$28,417	$21,829
1 " "	'16	64,622	*27,428	37,194	28,679	8,515
12 " "	'17	915,378	*356,985	558,393	343,142	215,251
12 " "	'16	741,241	*326,371	414,870	344,329	70,541
COMMONWEALTH POWER RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.						
1m., Feb.,	'17	$1,530,735	*$925,409	$605,326	$430,917	$174,409
1 " "	'16	1,362,995	*709,410	653,585	408,330	245,255
12 " "	'17	17,340,513	*9,696,593	7,643,920	5,076,403	2,567,517
12 " "	'16	14,977,054	*7,978,108	6,998,946	4,603,102	2,395,844
EL PASO (TEX.) ELECTRIC COMPANY						
1m., Feb.,	'17	$111,254	*$64,067	$47,187	$5,312	$41,875
1 " "	'16	91,146	*45,584	45,562	4,722	40,840
12 " "	'17	1,141,886	*693,623	448,263	60,290	387,973
12 " "	'16	1,006,674	*528,951	477,723	51,379	426,344
GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.						
1m., Feb.,	'17	$148,284	*$104,970	$43,314	$36,761	$6,553
1 " "	'16	145,763	*99,442	46,321	36,617	9,704
12 " "	'17	1,953,997	*1,248,750	705,247	439,456	265,791
12 " "	'16	1,927,491	*1,215,644	711,847	434,099	277,748
HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.						
1m., Feb.,	'17	$25,249	*$17,635	$7,614	$5,183	$2,431
1 " "	'16	24,165	*16,077	8,088	5,523	2,565
12 " "	'17	331,399	*189,658	141,741	63,279	78,462
12 " "	'16	286,881	*160,712	126,169	66,358	59,811
NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO						
1m., Feb.,	'17	$477,004	$297,208	$179,796	$82,680	$97,116
1 " "	'16	359,403	167,676	191,727	98,740	92,986
2 " "	'17	967,385	580,051	387,334	166,688	220,646
2 " "	'16	726,545	344,428	382,117	187,175	194,942
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.						
1m., Feb.,	'17	$25,550	*$18,830	$6,720	$7,180	†$460
1 " "	'16	25,618	*14,829	10,789	7,378	3,411
12 " "	'17	312,229	*222,382	89,847	86,314	3,533
12 " "	'16	292,168	*177,877	114,291	90,666	23,625
PENSACOLA (FLA.) ELECTRIC COMPANY						
1m., Feb.,	'17	$26,909	*$15,083	$11,826	$7,800	$4,026
1 " "	'16	21,832	*11,686	10,146	8,066	2,080
12 " "	'17	288,287	*162,614	125,673	92,462	33,211
12 " "	'16	263,590	*147,430	116,160	86,891	29,269
PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.						
1m., Feb.,	'17	$720,177	*$440,390	$279,787	$189,142	$90,645
1 " "	'16	597,214	*432,928	164,286	183,795	†19,509
12 " "	'17	8,348,610	*5,168,424	3,180,186	2,227,602	952,584
12 " "	'16	7,563,813	*4,811,870	2,751,943	2,186,819	565,124
SAVANNAH (GA.) ELECTRIC COMPANY						
1m., Feb.,	'17	$69,295	*$42,645	$26,650	$23,655	$3,085
1 " "	'16	60,396	*44,167	16,229	21,355	†6,792
12 " "	'17	843,910	*559,154	284,756	284,061	695
12 " "	'16	785,159	*518,011	267,148	278,465	†11,317

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

Seeking Relief from Traffic Delays

Head of New York Railways Appeals by Letter to Truck Owners for Clear Tracks—Responses Very Gratifying

The streets of New York are the scenes of the worst traffic congestion in their history, due to the enormous amount of building operations and other obstructions which figure in the subway construction. The number of automobiles has increased almost 200 per cent annually during the last three years, making the total number in use in the metropolitan district alone more than 314,000. To these are added many more which enter from New Jersey. The resulting use of the street car tracks by vehicles has so impaired the trolley service that officials of the New York Railways are endeavoring to secure some measure of relief. During one stormy day last winter the company suffered a loss of 22,000 car-miles, or nearly 25 per cent of its usual mileage, due largely to automobiles and trucks using the tracks, which were cleared of snow.

DELAYS OFFSET CAR IMPROVEMENTS

As noted in the ELECTRIC RAILWAY JOURNAL for March 10, page 459, the modern improvements in car service intended to promote speedy operation are more than offset in New York by delays to which the cars are subjected, and in some cases the scheduled speed in the congested districts has been reduced from 6½ m.p.h. to 5½ m.p.h. It is evident that until street conditions are more nearly normal all street users must pledge greater co-operation. As a step toward this end Theodore P. Shonts, president of the New York Railways, has sent about 6000 letters to all truck owners and firms using auto trucks or horse-drawn vehicles for delivery purposes, inviting their help in keeping the tracks clear. Many replies have been received which without exception voiced favorable attitude, and some firms asked for further suggestions from the company for methods by which their drivers could be made more responsible. The appeal by Mr. Shonts was substantially in full as follows:

PRESIDENT SHONTS URGES CO-OPERATION

"The cars, of course, must stay on the tracks; they cannot ride around automobiles or trucks. When a car is delayed the number of people inconvenienced is very greatly in excess of the number who can possibly benefit, even temporarily, by the use of the tracks. A great deal of this use of the tracks is doubtlessly due to thoughtlessness, but no matter what the cause, the result is the same. Drivers frequently drive in the middle of the street when there is ample room to proceed at the side.

"An ordinance of the city of New York provides that vehicles using the tracks must turn out immediately upon signal from the motorman of an approaching car. It is a well-known fact that this ordinance is violated by drivers and the violation ignored by the police. You can aid in securing an observance of the law and facilitating the movement of traffic by requiring your drivers to keep off the tracks.

"Efficient street car service is of vital concern to every merchant in New York City. Most customers make part of the journey by subway and 'L' and complete it to the store on the street car. The firm of James A. Hearn & Son has instructed its drivers to keep off the car tracks. It recognizes that for its wagons to block street cars is to delay its own customers. Others will, I am sure, want to do the same thing, as this is a matter which should be of interest to the whole community.

"May I not ask, therefore, that you instruct your drivers to avoid the use of the car tracks, or the middle of the street on which there are tracks, unless it is impossible to get along in the space to the side? This, I take it, would not interfere with your work or comfort, and it would aid us tremendously in our efforts to serve the public under exceedingly difficult street conditions."

Bay State Files New Rates

The Bay State Street Railway, Boston, Mass., has filed a new schedule with the Public Service Commission of Massachusetts which slightly increases the price of its reduced-rate tickets. At present the company sells forty-nine reduced-rate tickets at 3.5 cents each, good during certain morning and evening hours in either a 5 or a 6-cent zone. The majority of the tickets are used between points embracing two zones and are purchased at 7 cents each. It is proposed to increase most of these rates to 8.5 cents. In most instances the regular fare between two such points is 11 cents. About twenty reduced-rate tickets, good for all hours of the day and in some cases in three or four zones, are also used. The company maintains that this is a discrimination against other patrons who pay the regular fare, and these tickets will be discontinued except in some cases where a reduced-rate ticket for certain hours will be substituted on account of heavy riding.

The company has also filed with the commission a tariff which eliminates half fares for school children. It contends that the Massachusetts statute requiring such fares is unconstitutional, in view of the fact that the company is thereby obliged to carry this class of passengers at a loss. Although the Supreme Court has passed favorably on the general interpretation of the law, it was held in the case of Commonwealth vs. The Interstate Consolidated Street Railway that if the requirement causes an actual loss to the company, it may be deemed unconstitutional. The commission will probably hear this case early in May.

Hearing on Discontinuance of Service

The Public Service Commission of Massachusetts recently heard the case of remonstrators opposing the discontinuance of service on the Wilmington Center-Billerica Center line of the Bay State Street Railway, Boston, Mass. The company proposed to abandon the line because the traffic is insufficient to meet operating expense. S. H. Pillsbury, counsel for the company, maintained that the commission has no authority to order a continuance of service provided the company abandons the location, unless the road is restrained by an agreement to the contrary.

The line in question is about 6½ miles long and was formerly a part of the through route from Lowell to Boston. Howard F. Fritch, of the company's statistical department, said that during the year ended June 30, 1916, the total receipts per car-mile were 6.12 cents. The receipts per car-hour were 50 cents, while the wages of motormen and conductors averaged 61 cents per car-hour, and the average operating expense per car-hour for the entire company, including interest, rentals and taxes was $2.50. The total revenue was $1,852.84 during that period. Last winter the company spent $900 for snow removal. R. S. Goff, vice-president and general manager of the company, said that about $64,000 would be necessary to put the track in fair condition.

The patrons opposing the abandonment of the line expressed their willingness to pay higher fare to have the service retained. The hearing was closed, the company and remonstrators agreeing to endeavor to reach a settlement.

Higher-Fare Movement in Rochester

James F. Hamilton, general manager of the Rochester Lines of the New York State Railways, announces that the company is considering an application to the Public Service Commission of the Second District for permission to increase its fare from 5 cents to 6 cents. Within the last five years the company has increased the wages of its employees about 18 per cent. It is spending one-third of its gross revenue of $4,107,442 for capital improvements and, with the steady increase in operating expenses, a 5-cent fare with free transfers is an insufficient unit. No definite plan has yet been adopted. Among the methods considered, besides the general fare increase of from 5 cents to 6 cents in the city limits with free transfers, are the adoption of a straight 5-cent fare with a charge of 1 cent for each transfer and the establishment of a zone system.

Proposed Freight Advance

I. C. C. Statement in Regard to Proposed 15 Per Cent Increase in Freight Rates

Following requests by the carriers throughout the country to be permitted to file supplements to existing rate schedules, proposing general increases in rates of 15 per cent, except as to a few specified commodities, the Interstate Commerce Commission has recently heard in conference large numbers of representatives of the carriers and shippers respecting the matter. The purpose of these requests is to avoid the expense and delay incident to the full and detailed preparation and re-publication of all of the existing tariff schedules, substituting in detail the proposed increased rates for those now in effect.

The commission announces that it has issued permissive orders as an emergency measure authorizing the filing of rate supplements, but has reached no determination, and has expressed no views or opinion upon the question of the reasonableness or propriety of the proposed increases, which will be subject to protest, suspension, complaint, investigation and correction if they are found to be in conflict with any provision of the interstate commerce act. Reasonable opportunity will be afforded for the presentation and consideration of protests.

Better Service for Providence

As a result of a special report made to the City Council of Providence, R. I., by Public Service Engineer Brunet, the Rhode Island Company has been ordered to reroute ten of its principal car lines so as to provide quicker service. The lines will loop just outside the center of the city instead of running through Exchange Place. Mr. Brunet found that last year the company carried 16,690,948 transfer passengers in addition to fare passengers, and that for each increase of 1000 in the population of the city it has to transport 702,000 revenue-paying passengers. The problem before the company is realized from the fact that the normal growth in population is from 4000 to 5000 a year.

Steamer Supplements Railway Service.—The Northwestern Ohio Railway & Power Company, Toledo, Ohio, put the steamer *Presque Isle* into service on April 22 between the eastern terminus of its road and Sandusky, across the Sandusky Bay. The road is operated between Toledo and Bay Point, just west of Sandusky.

Louisville Employees Discuss Rules.—The rule book was the subject for consideration at the last of the regular get-together meetings of the trainmen of the Louisville (Ky.) Railway. Samuel Riddle, superintendent of transportation, presided. The men handled the rules constructively and in a number of cases touched upon the incidents which led to their adoption.

Tool Boxes Removed.—The Kansas City (Mo.) Railways has removed the tool boxes from all cars. The order is a result of a careful investigation to discover whether a tool box had ever been used. The men have recently been instructed to report all defects promptly, and have been in the habit of bringing the cars in for repairs, however trivial the damage might be.

Supervisors Direct Buffalo Traffic.—The International Railway, Buffalo, N. Y., has adopted a policy of increasing the number of uniformed traffic supervisors. Within the last few months several experienced motormen and conductors have been promoted to the position of supervisor, and officials of the company say this new policy has done much to keep cars on schedule and facilitate the handling of passengers.

New Orleans Survey Financed.—An appropriation of $12,000 has been made by the City Council of New Orleans for the work of the special commission about to make a transportation survey in that city, as reported in the issue of this paper for April 14, page 712. Of this sum $10,000 will go to J. E. Allison, who is conducting the investigation, and the remainder will be used for incidental expenses. The money will be taken from the city treasury balance of the year 1916.

Bus Company Gets Franchise.—The City Council of Portland, Ore., has granted to the Portland Trackless Car Company a franchise authorizing it to operate jitneys between Portland and Linnton. The franchise, like the others which have been granted to this company, will be submitted to the voters at the municipal election on June 4. The Council granted the franchise, pending the outcome of the franchise election, with the same regulations as those of other "for hire" cars which are now operating in the city of Portland.

Finding on L. A. & W. Service.—An investigation made by the Public Utilities Commission of Maine, following a petition against the Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., alleging inadequate service in the Augusta, Gardiner and Waterville districts, has revealed that the chief difficulty is a lack of power. In the finding it is noted that $200,000 is to be expended immediately for additional power facilities and the purchase of more cars. The evidence taken did not indicate that there had been excessive over-crowding of cars except where the regular quota of cars was not furnished.

Fare Increases Proposed for Utica.—The New York State Railways, Utica Lines, has filed with the Public Service Commission for the Second District of New York a new tariff showing increased fares as follows: Local round-trip fares advanced 5 cents between Rome and Utica, Frankfort, Ilion, Mohawk and Herkimer; between Utica and Utica Park and Frankfort, Ilion, Herkimer and Little Falls; and between Little Falls and Frankfort, Ilion, Mohawk and Herkimer; also advanced 10 cents between Little Falls and Rome. The sale of interchangeable coupon ticket books at $10 per book containing 1200 coupons of the face value of 1 cent each will also be discontinued. The changes are to be effective on May 15.

Restraining Order Protects Bus Company.—A temporary order forbidding Secretary of State I. M. Howell or the prosecuting attorney of King County, Seattle, Wash., from interfering with the operation of the Ferry Line Auto Bus Company at West Seattle was issued recently by Judge Everett Smith in the Superior Court. The company asserts that agents of the Secretary of State threaten prosecution unless it pays a license fee for one year. By action of the last Legislature, bus companies, operating within city limits, will no longer be required to pay the license fee. The company has offered to pay a pro rata portion from March 1 to June 12. The line is operated in conjunction with the Port of Seattle Commission's ferry.

Plans for Use of One-Man Cars Abandoned.—The Corning & Painted Post Street Railway, Corning, N. Y., has decided against the use of one-man cars. Early in March the company equipped a number of cars so they could be operated by one man, but before the plan went into effect notice was served upon the company by the Mayor of Corning that he would not allow the operation of cars over the city lines with one man. Employees of the company voted to strike unless the company rescinded its one-man crew order. After a conference at which the officers of the company endeavored to secure the consent of the municipal authorities for a trial of the one-man system they agreed to continue the operation of cars with a motorman and conductor. The Mayor contended it would be unsafe to operate one-man cars over certain crossings.

I. T. S. Prosecutes Annoying Passengers.—The Illinois Traction System, Peoria, Ill., is resorting to severe measures in a campaign against rowdyism on its interurban cars. Several cases against riotous passengers, where over-indulgence in liquor was the cause, have been prosecuted. A prominent resident of the eastern part of Sangamon County was recently fined $25 and costs, amounting to $49.50 in the County Court. It is the endeavor of the company to keep passengers who are under the influence of liquor off its cars, and conductors have strict instructions to this effect. Occasionally, however, such passengers succeed in boarding the cars and postpone their boisterous conduct until after the car has left the terminal. These conditions have been especially annoying where there are isolated "wet" towns, and the company hopes through its operating and legal departments to censor the conduct of these undesirables for the benefit of regular patrons.

Committee Reports on Niagara Service.—The public service committee of the Greater Niagara Falls Commercial Association, Niagara Falls, N. Y., which was appointed several months ago to investigate local service of the International Railway, has made its report. Much of the blame for delays has been placed upon steam railroads for blocking grade crossings. As a result of the co-operation between International officials and the special traffic committee additional cars have been placed on the lines during the morning and evening rush hours, and schedules have been so arranged that better connections are made at transfer points. Through car service has also been inaugurated between the north and the upriver electric districts. Favorable comment has been made in the local press upon the co-operation given the municipal authorities and the commercial association, and the improved service is credited largely to E. H. Henning, superintendent of the Niagara Falls local lines of the International.

Bus and Railway Vie for Billy Sunday Traffic.—The Public Service Commission for the First District of New York has issued to the Fifth Avenue Coach Company, operating buses, a certificate of convenience and necessity to permit the operation of several of its stage routes north to 169th Street and Broadway during the term of the Billy Sunday evangelistic services. A somewhat unusual situation occurred at the hearing before the commission preceding the issuance of the necessary certificate, owing to the fact that an officer of another public utility corporation, namely, the Third Avenue Railway, appeared in opposition to the grant as requested. The opposition of the Third Avenue Railway was based on the fact that the proposed bus line extensions created "an element of unfair competition" with the cars of several of the railway lines. The commission, however, in issuing the certificate accepted an agreement from the coach company to change its hours of operation if deemed necessary so as to overcome any just cause for complaint that the railway company might have against the alleged competition.

Company Y. M. C. A. Proves Popular.—An article entitled "Blazing the Trail," in the March-April number of *Railroad Association Magazine*, by T. Norman Jones, Jr., assistant general manager of the Virginia Railway & Power Company at Norfolk, Va., relates the success of that company's Young Men's Christian Association, which was established for its employees in 1904. The membership of the association last year averaged 680, about seventy of whom were in a branch established in South Richmond. Its home affords reception rooms, a reading room, a bath room, barber shop, pool tables, games, etc., a library of more than 2000 volumes and an assembly hall which seats about 300 people. Weekly noon-hour services in the shops were conducted last year with an average attendance of about forty-five, and other weekly meetings are held, addressed by ministers and other speakers. Between 450 and 500 members use the building daily and it is estimated that 36,000 letters were written last year in the writing room. The monthly dues in the association are 25 cents, the major portion of the expense being borne by the company.

Reduction in N. Y. C. Fares Refused.—An opinion by Commissioner Travis H. Whitney has been approved by the Public Service Commission for the First District of New York in the case brought by the Taxpayers' Alliance of the Bronx, a borough of New York, to compel the New York Central Railroad to reduce its fares for local service on the Harlem Division within the city limits, and to increase its service. The opinion states that the commission cannot comply with the request of the alliance. No order, however, has yet been adopted by the commission, but a copy of the opinion has been submitted to the company and the attention of its officials was called to the concluding paragraph in which Commissioner Whitney points out that the company should find some method of access to the Grand Central station in addition to its Park Avenue tracks in Manhattan. Reports have been in circulation that the company might at some future time connect the west side tracks with the Grand Central station by means of a tunnel. This would make it possible to increase materially the number of trains for local service operated upon the Park Avenue tracks.

Personal Mention

E. H. Johnston has been elected a vice-president of the Cities Service Company, New York, N. Y., to succeed Charles T. Brown.

Newton M. Hudson, auditor of the Second Avenue Railroad, New York, N. Y., has been appointed receiver of the company to succeed John Beaver, deceased.

C. I. Kephart of California is valuation engineer for the Interstate Commerce Commission handling the valuation of the Butte, Anaconda & Pacific Railway, Anaconda, Mont.

H. E. Vordermark, secretary and auditor of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has been elected vice-president and treasurer of the company.

John A. Britton, vice-president and general manager of the Pacific Gas & Electric Company, Sacramento, Cal., has been appointed by the Governor of California to membership on the California State Defense Board.

E. J. Davis, formerly assistant superintendent of transportation of the El Paso (Tex.) Electric Railway, has been transferred to Beaumont as purchasing and claim agent for the Stone & Webster properties in that city.

F. H. Schmidt, for eleven years assistant auditor of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has been appointed auditor to succeed H. E. Vordermark, who becomes vice-president and treasurer.

Thomas E. Dempsey has been named chairman of the Public Utilities Commission of Illinois by Governor Lowden. Mr. Dempsey has been Assistant Attorney General during the terms of the last three Attorney Generals of that State.

M. C. Whiting, until recently assistant superintendent and electrical engineer of the Cairo Railway & Light System, Cairo, Ill., a subsidiary of the Illinois Traction System, has entered private business in that city as superintendent of the International Silica Company.

Henry L. Doherty of the Cities Service Company, and George Williams, who first suggested flood-lighting the Statue of Liberty, have been appointed by Mayor Mitchel of New York to the illumination committee to help design a fitting welcome for the Allied Commission.

Byron C. Fowles, secretary-treasurer, general superintendent and purchasing agent of the Pine Bluff (Ark.) Company, has resigned, effective May 1, to become general manager of the public utilities in Kingsport, Tenn., which are owned by the Equitable Securities Company, New York, N. Y.

H. W. Dyson, comptroller of the British Columbia Electric Railway, Ltd., Vancouver, B. C., has resigned to become general manager of the Yorkshire & Canadian, Ltd., at Vancouver. Mr. Dyson went to Vancouver from England in 1910 as assistant to George Kidd, then comptroller, and was promoted in 1914 when Mr. Kidd was made general manager of the company.

A. R. Piper, general freight agent of the Brooklyn (N. Y.) Rapid Transit Company, who is on the retired list of the United States Army with the rank of captain, has been ordered back to duty by the government. Captain Piper, just prior to his call to the country's service, organized a department on the Brooklyn Rapid Transit System for the protection of the company's physical property against attack by alien enemies.

Howard Elliott has resigned as president of the New York, New Haven & Hartford Railroad. effective on May 1. Mr. Elliott will become chairman of the newly organized committee on intercorporate relations, which is to consist of the presidents and vice-presidents of the companies in the New Haven system. In this position he will act in an advisory capacity with the purpose of co-ordinating the activities of the several subsidiary concerns.

E. J. Pearson has been elected president of the New York, New Haven & Hartford Railroad succeeding Howard Elliott.

Mr. Pearson was a vice-president of the company in charge of construction, operation and maintenance. He has had a wide experience, especially in the construction of terminals with which he was connected in Chicago, St. Louis, Kansas City and New Orleans. He has also acquired an invaluable training in operating problems and railway economics from his varied services in this field.

W. Saville, formerly chief clerk of the British Columbia Electric Railway, Ltd., Vancouver, B. C., has been appointed comptroller of that company, succeeding H. W. Dyson. Mr. Saville entered the employ of this company in 1911. Prior to that time he was associated with the Aire & Calder Navigation Company at Leeds, Yorkshire, England, as chief assistant to the secretary. He had also been with the Underground Electric Railways of London, England, under Sir Robert Perkins and the late Charles T. Yerkes.

Benjamin F. Cresson and **William D. Ray** were tendered a farewell banquet recently at the Pomfret Club, Easton, Pa. Their many friends took this means to show their appreciation of the services of their guests, who have resigned their positions with the Pennsylvania Utilities Company. Mr. Cresson had been with the company and its predecessors more than fifteen years as president of the Easton Gas Company. Mr. Ray was vice-president and general manager of the present organization for two years. Wesley M. Heiberger presided.

C. R. Richards, head of the mechanical engineering department of the University of Illinois since 1911, has been appointed dean of the College of Engineering and director of the Engineering Experiment Station to succeed Dr. W. F. M. Goss, who resigned recently to become president of the Railway Car Manufacturers' Association of New York. Dean Richards was graduated from Purdue University in 1890 and has been successively instructor in mechanical engineering in Colorado Agricultural College, and professor of practical mechanics, professor of mechanical engineering and dean of the College of Engineering of the University of Nebraska. Since entering the University of Illinois he served two years as acting dean of the College of Engineering during an absence of Dean Goss. He is a member of the American Society of Mechanical Engineers, the Western Society of Engineers and the Society for the Promotion of Engineering Education.

E. F. Kelley, chief clerk to James P. Barnes, general manager of the Schenectady (N. Y.) Railway, entered the railway field with the New York Central Railroad as chief clerk to S. J. Kearns, who was assistant superintendent of the western division with headquarters at Syracuse, N. Y. Mr. Kelley has been connected with the New York State Railways since 1909, when he entered the mechanical and engineering departments of the Utica and Syracuse lines. In 1914 when the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., passed into the control of Allen & Peck, Inc., James P. Barnes, then general manager, made Mr. Kelley chief clerk and later he was appointed, in addition, purchasing agent of the company. He resigned this position to accompany Mr. Barnes, who recently became general manager of the Schenectady property. Mr. Kelley was secretary-treasurer of the Railway Club of Rochester and upon leaving Rochester he was elected to honorary membership.

James E. Allison will soon begin the work of conducting the extensive survey of transportation conditions in New Orleans, La. Mr. Allison has done much work along the lines of public service investigation and is the author of several reports and articles on valuation and regulation subjects. Following a year of service on the Board of Engineers of St. Louis and as consulting engineer in a department of the St. Louis World's Fair, he was made commissioner and chief engineer of the St. Louis Public Service Commission in 1909 and was reappointed in 1911. In his capacity as chief engineer he made valuations of public service property for several companies in St. Louis representing a capitalization of about $170,000,000. In 1913 he resigned to engage in consulting practice and made a specialty of public service valuation work. He was later appointed to lecture in Washington University, St. Louis, Mo., on the economic principles relating to the regulation of public utilities. Mr. Allison has established a fund for promoting the study of public utility economics.

G. A. MURCH

George A. Murch has been appointed general manager of the St. Albans & Swanton Traction Company, St. Albans, Vt., and the Public Electric Light Company, that city, succeeding F. C. Wilkinson, resigned. Mr. Murch is a pioneer in the construction and operation of electric railways, having started with the Thomson-Houston Company, for which company he built and managed the first electric railway in Toledo, Ohio, and later was manager of the Attleboro (Mass.) Street Railway System. He was then employed by the firm of Shaw & Ferguson as superintendent of construction of the Worcester, Leicester & Spencer Electric Railway, at that time the longest street railway in New England, and upon its completion was elected manager. After two years the Worcester Construction Company was organized with Mr. Murch as one of the original five members, and during its life he was connected with the construction and management of street railways throughout the United States. Other work contributing to Mr. Murch's wide experience has been his services during the last few years in responsible positions with the Bradford & Olean Street Railway, the Maynard, Acton & South Acton Street Railway and the Atlantic Shore Line Railway. During the last six months he has been engaged in constructing a three-phase high-tension line for one of the companies of which he has just been made manager.

Obituary

John F. Milnor, who has been connected with the law department of the Brooklyn (N. Y.) Rapid Transit Company for a quarter of a century, died at his home in that city on April 24.

William J. Hurn of the Louisville (Ky.) Railway is dead. Mr. Hurn entered the service of that company in 1883 as a driver on one of the old mule cars, and was gradually promoted to the position of superintendent of the change and transfer department.

W. J. O'Neill, assistant treasurer of the Brooklyn (N. Y.) Rapid Transit Company, died on April 21. Mr. O'Neill began his services with that company in 1894 as bookkeeper and after receiving other promotions in the auditing department he was appointed to his last position in 1904.

Richard W. Meirs, vice-president of the Hudson & Manhattan Railroad, New York, N. Y., died at his home in Philadelphia, Pa., on April 20 at the age of fifty-one. Mr. Meirs was graduated from Princeton University with the class of 1888. At the time of his death he was a director of the Commercial Trust Company of America and of several railway and power companies, principally in Pennsylvania. Mr. Meirs was a member of the Pennsylvania Historical Society and manager of the Franklin Institute. He also claimed membership in the Metropolitan, Princeton and Grolier Clubs of New York City and several local clubs in Philadelphia.

John Beaver, receiver of the Second Avenue Railroad, New York, N. Y., died on April 19 in his seventy-fourth year at his home in that city. He was born in Esopus, N. Y., and after attending the public schools he took a course at the New York Free College. He served in the civil war and afterward became cashier of the Third Avenue Railway. In March, 1900, he was elected president of the Forty-second Street, Manhattanville & St. Nicholas Avenue Railway, a position which he held until 1908, when he was made secretary and treasurer of the Central Park, North & East River Railway. Later he became president of the Second Avenue line. In 1900 he became also vice-president of the Empire City Savings Bank, and in 1913 was elected president, a position he held at the time of his death.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

FRANCHISES

San Diego, Cal.—The San Diego Electric Railway has asked the City Council for a franchise to construct a line on Fifth Street from University Avenue to Washington Street, thence along Washington Street to First Street. Sealed bids will be received by the Council for this franchise until May 14.

Savannah, Ga.—The Savannah Electric Company will ask the City Council for a franchise to construct an extension south on Abercorn Street to Fifty-first Street and west on Fifty-first Street to Barnard Street.

Brooklyn, N. Y.—The bureau of franchises has recommended to the Board of Estimate that May 18 be fixed as a date for a hearing on the petition of the Nassau Electric Railroad, controlled by the Brooklyn Rapid Transit Company, for a franchise to construct an extension on Eighty-sixth Street from Fifth to Third Avenue, Brooklyn. Application for this franchise was made by the company several months ago. This company is also petitioning for a renewal of its franchise to operate a single-track line along Georgia Avenue, and from Liberty Avenue to Atlantic Avenue, and for a renewal of its contract with the city under which it is operating a single-track line along Flatbush Avenue. If the recommendations of the Bureau of Franchises are adopted hearings will be held on these matters, respectively, on April 30 and May 18.

Johnstown, Pa.—The Johnstown Traction Company has received a new franchise from the City Council of Johnstown.

Wapate, Wash.—The Pacific Power & Light Company has received a fifty-year franchise from the City Council to furnish light and power in Wapate.

Moundsville, W. Va.—The Wheeling Traction Company has received a franchise from the City Council to make changes in its line in Moundsville.

TRACK AND ROADWAY

Globe-Miami Railway, Globe, Ariz.—Surveys will be begun at once of this company's proposed line from Globe to Miami, and it is expected that construction work will be begun shortly. Arrangements are being made to construct a large amusement park midway between Globe and Miami. where a dance pavilion, bath house and pool will be built. Edgar Sultan, Globe, secretary. [April 7, '17.]

Municipal Railways of San Francisco, San Francisco, Cal.—A contract has been awarded by the Board of Works to John Spargo, San Francisco, for concrete trolley poles on Upper Market Street for the Church Street line of the Municipal Railways.

Connecticut Company, New Haven, Conn.—This company plans to extend its tracks easterly along State Street to Water Street and through Water Street to Congress Street, Bridgeport, where connection can be had with the main line across the bridge.

Atlanta & Anderson Electric Railway, Atlanta, Ga.—This company was organized at a recent meeting of the stockholders in Atlanta. A bill was passed by the last regular session of the Georgia Legislature amending the general railway law so as to provide for the incorporation of interurban railroads, and under the new law the Atlanta & Anderson Railway received from the Secretary of State a charter as an interurban railroad. The entire capital stock has already been subscribed, and it was announced by the officers of the company that as soon as the issue of securities is authorized by the Railroad Commission of Georgia the work of construction will be commenced. The following board of directors was elected: J. G. Craft, G. W. Westbrook, H. P. De laPerrie, I. H. Phillips, William D. Bowers, W. B. Hardman, C. J. Hood, W. H. Smith, R. L. J. Smith, W. E. Simmons, J. L. Murphy, Albert Howell, Jr., Mark Bolding, L. G. Greer and Hugh Howell. J. L. Murphy was elected president and Mark Bolding secretary of the company. The present plan contemplates that the new line will be completed and in operation within two years, connecting Atlanta with Anderson, S. C., where it will connect with the Piedmont & Northern Electric Railway. [Feb. 3, '17.]

Georgia Railway & Power Company, Atlanta, Ga.—This company plans to spend $160,000 in reconstructing its tracks during this year.

South Georgia Power Company, Valdosta, Ga.—A communication from B. Parks Rucker, Schenectady, N. Y., states that the South Georgia Power Company has been organized to develop a hydroelectric plant on Willacoochee River, 4 miles west of Valdosta, Ga. It will supply power to Valdosta, Quitman, Boston, Thomasville, Pelham, Moultrie, and other neighboring towns and cities. Power will also be supplied to the Valdosta Street Railway. [March 24, '17.]

***Du Quoin, Christopher & Eastern Traction Company, Du Quoin, Ill.**—This company contemplates the construction of a line from Du Quoin easterly to West Frankfort and from Du Quoin southerly to Carbondale.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—This company will be delayed two months in the extension to its city lines in Waukegan, and in the reconstruction of its present lines, the delay being on account of the inability to secure materials. Work will be begun on the extension of the line on North Avenue and Glen Flora Avenue to the tannery and on other proposed improvements as soon as materials can be assembled.

Peoria & Chillicothe Electric Railway, Peoria, Ill.—A formal order increasing the capital stock of the Peoria & Chillicothe Electric Railway from $5,000 to $165,000 was approved by the stockholders of the company at a recent annual meeting in Chillicothe. A. S. Black, secretary, explained that the increase in capital stock was made in order to begin operations, the smaller sum being subscribed at first for the purpose of lessening the expenses of the company until it was time to actually start operations. [March 10, '17.]

Springfield & Carbondale Railway, Springfield, Ill.—Work has been begun at Harvel on this company's proposed line from Springfield to Carbondale. C. H. Forrester, Chicago, president. [April 14, '17.]

Union Traction Company, Anderson, Ind.—Extensive improvements have been made by the Union Traction Company at Mounds Park, near Anderson.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company will build a single-track line in West Tenth Street from Bismarck Avenue to Tibbs Avenue. The work will be begun not later than Aug. 15 and will be completed by Oct. 18.

Arkansas Valley Interurban Railway, Wichita, Kan.—Preparations are being made by the Arkansas Valley Interurban Railway for its proposed extension north from Newton or Halstead to Salina.

Paducah (Ky.) Traction Company.—This company is double-tracking some of its lines in Paducah, the work to continue for three months.

Bay State Street Railway, Boston, Mass.—Plans have been submitted by the Bay State Street Railway to the commissioner of streets and highways for the relocation of its tracks on the Pawtucket Falls bridge and into Mammoth Road and Varnum Avenue. The plan provides for two sets of tracks on the bridge.

United Railways, St. Louis, Mo.—Work will soon be begun by the United Railways on track reconstruction and the building of extensions. The most important extension contemplated for this season is one along the city limits southwardly from Wydown Boulevard to Manchester Avenue. The company expects to operate this track as a southern extension of the present Hamilton Avenue line. This work may not be entirely completed this season, but it is anticipated that the portion as far as the Market Street line will be in operation by fall. The company will also rebuild the bridge over the Rock Island tracks in Clayton.

Panama Traction Company, Jamestown, N. Y.—The Public Service Commission for the Second District of New York has granted the Panama Traction Company permission to use gasoline as the motive power for its proposed line between Panama and Asheville. D. L. Davis, Jamestown, general manager. [March 31, '17.]

Interborough Rapid Transit Company, New York, N. Y.—Operation was begun on April 21 of the Corona extension of the dual transit system from the Bridge Plaza station in Long Island City to Alburtis Avenue, Corona.

Interstate Electric Corporation, New York, N. Y.—Plans are being prepared and surveys made by the Interstate Electric Corporation for its proposed railway in San Angelo, Tex. Construction work on the line will be begun at once, it is announced, but officials of the company say that through the inability to get steel from the mills the work will go forward slowly. R. W. Davidson, New York, secretary. [Dec. 9, '16.]

Halifax Electric Tramway Company, Ltd., Halifax, N. S.—Surveys are being made by the Halifax Electric Tramway Company, Ltd., for an extension of its line. The company is in the market for additional rolling stock, rails, ties and general construction material. J. W. Crosby, general manager.

Cincinnati (Ohio) Traction Company.—Walter A. Draper, vice-president of the Cincinnati Traction Company, appeared before the Council committee on street railways on April 23 in opposition to the full program for the construction of fifteen extensions, as mapped out by the committee. He said the funds are not available and that consent for the issue of new capital must be obtained from the Public Utilities Commission and the city authorities. He objected to the plan of building an additional track on Central Avenue, as the street is too narrow. Mr. Draper advised the committee to select a few streets on which extensions are considered absolutely necessary, but at the same time advised that great difficulty may be encountered in securing steel rails enough for this purpose. The committee named four streets and agreed to refer the matter to the city solicitor and the city engineer for consideration.

Oklahoma (Okla.) Railway.—This company will construct a ½-mile extension from Broadway and Thirteenth Street northward.

Toronto Suburban Street Railway, Toronto, Ont.—Operation will be begun on May 1 on this company's line from Toronto to Guelph, 46 miles.

Johnstown-Somerset Traction Company, Johnstown, Pa.—The directors of the Johnstown-Somerset Traction Company have decided to complete that part of the company's proposed line from Johnstown to Jerome and to place it in operation as soon as possible. The company proposes to construct a line from Johnstown to Rockwood. Kent Miller, Somerset, secretary. [Dec. 10, '16.]

Philadelphia, Pa.—Sealed proposals will be received by the Department of City Transit, Philadelphia, until May 1 for 168 column foundations in Frankford Avenue from Unity Street to Dyre Street, Frankford Elevated Railway, contract No. 503. Copies of plans and specifications may be obtained upon deposit of $10, to be refunded upon return of plans.

***Texas Electric & Power Company, San Angelo, Tex.**—This company has been organized at San Angelo with a capital stock of $200,000 for the purpose of constructing an electric railway system in San Angelo, and electric interurban lines radiating in several directions. Officers: Charles W. Hobbs, San Angelo, president; R. J. Irvine, San Angelo, vice-president, and M. F. Treadwell, Ballinger, secretary.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—Work has been begun by this company on the construction of an extension from Granger to Magna.

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—An appropriation of $1,100,000 has been voted by the Pacific Electric Railway for the construction and equipment of car shops at Torrance, 10 miles south of Los Angeles. This is an increase of $600,000 over the amount previously appropriated for this purpose, as stated in the ELECTRIC RAILWAY JOURNAL for Jan. 6. The larger buildings will be of reinforced concrete, steel and brick. There will be a heavy machine shop and paint shop, each 180 x 450 ft.; freight car shop, 180 x 400 ft.; blacksmith shop, 155 x 200 ft.; power house, 60 x 120 ft.; dry lumber and iron storage buildings, coal bunkers, scrap bins, offices, etc. Heretofore this work has been done chiefly at the company's shops at Seventh Street and Central Avenue, Los Angeles, which are now being dismantled.

Worcester (Mass.) Consolidated Street Railway.—This company will expend about $75,000 this year on the construction of two trolley freight terminals. One is for the Boston & Worcester Street Railway and the other for the Worcester Consolidated Street Railway.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York recently received bids for the construction of station finish for the three stations to be located on the Manhattan portion of the Park Place, William and Clark Street subway. These stations are at Wall and William Streets, Fulton and William Streets and Park Place and Broadway. The low bidder was John B. Roberts, New York, whose proffer was $139,919.

Philadelphia, Pa.—Sealed proposals will be received by the Department of City Transit, Philadelphia, until May 1 for additional steel superstructure and appurtenant work to provide station platforms on the Frankford Elevated Railway at Huntingdon Street, contract No. 520. Copies of plans and specifications may be obtained upon deposit of $10, to be refunded upon return of plans.

Reading Transit & Light Company, Reading, Pa.—A new building will be erected by the Reading Transit & Light Company at its North Tenth Street terminus for cleaning and washing cars. The building will be large enough to accommodate three cars at one time.

POWER HOUSES AND SUBSTATIONS

Arkansas Valley Railway, Light & Power Company, Pueblo, Col.—This company is installing a new 2500 kw. motor generator set in its Pueblo power station to facilitate the interchange of current between the Canon City and Cripple Creek divisions and the Pueblo station.

United Railways, St. Louis, Mo.—This company will construct a new substation in the western portion of the city.

Interstate Electric Corporation, New York, N. Y.—This company, which was granted a franchise some time ago to construct an electric railway system in San Angelo, Tex., will erect a power plant as soon as the necessary machinery and equipment can be obtained. R. W. Davidson, New York, secretary.

Richmond Light & Railroad Company, New York, N. Y.—This company has received permission from the War Department to install submarine cables in the Fresh Kills Creek from Rossville to Linoleumville.

Durham (N. C.) Traction Company.—A new turbine has been ordered by the Durham Traction Company which will more than double the present capacity of its power station.

Pacific Power & Light Company, Astoria, Ore.—This company is constructing a substation at Touchet, Wash., and will supply electricity from the Priest Rapids plant.

Reading Transit & Light Company, Reading, Pa.—The Metropolitan Electric Company, controlled by the Reading Transit & Light Company, has ordered an additional turbo-generator to cost $500,000, which will increase the plant's capacity from 30,000 to 62,000 hp. The company recently installed a 15,000-hp. generator in its West Reading plant.

Corpus Christi Railway & Light Company, Corpus Christi, Tex.—This company contemplates additional equipment in its plant and making other improvements to the property.

Washington Water Power Company, Spokane, Wash.—This company contemplates the erection of a high-tension transmission line from its power plant at Long Lake to Northport, about 90 miles.

Monongahela Valley Traction Company, Fairmont, W. Va.—It is reported that this company contemplates the construction of another generating plant to develop 50,000 kw.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Department for Buyers and Sellers

The purchasing agent of a large Western property writes that he has "found much pleasure in reading the 'Manufactures and Markets' columns. There is always considerable information which at times may be particularly valuable to the purchasing departments." This man then mentions several topics and suggests that a discussion of one or more of them might be taken up in this department to the advantage of both railway official and manufacturer.

The general manager of a railway and electric company writes: "We are particularly interested in the topics. 'Rising Prices and Their Effects,' 'Who Should Carry the Repair Parts Stock?' and 'Forehandedness in Buying.'"

The purchasing agent of a large Eastern interurban syndicate writes: "You are getting the right sort of information to your readers, and I want to compliment you on the way the subjects are handled." Then he asks for help in solving a problem in motor maintenance. Thus he has shown his confidence in the JOURNAL as a source not only of news, but also of technical information.

As a class, the purchasing agent is not prone to scatter praises, and so the good things that have been quoted and those that others have expressed are accepted as confirmation of the idea that through the institution of this department the railways would be served.

The manufacturers also have shown active interest in this department. Some of the topics here presented in which the manufacturers have shown special interest have been "Who Should Keep the Repair Parts Stock, the Railway or the Manufacturer?" "Forehandedness in Buying," "Standardization" and "The Raw Material Situation." Manufacturers not only have shown a willingness to discuss topics of general interest, but through constructive suggestions made, have shown that the class of material presented has been of assistance in cementing closer relations between the buyer and seller.

Purchase Standardized Products

Co-operation Between Buyers and Sellers Will Benefit Both—Reasons Given for Acceptance Now of Manufacturers' Standard Products

Standardization, if full co-operation between purchasers and manufacturers could be effected, would greatly relieve the tense situation which now embarrasses both buyers and sellers. It is difficult to understand why association standards and the standardized products of manufacturers are not more generally acceptable to electric railways.

"Arguments for the purchase of standard products are not pleas on the part of the manufacturer for his personal benefit," says the manager of a large industrial concern. "A sale no doubt would be made in any event, and the purchase of a standardized product rewards the purchaser as well as the manufacturer, because standardization means lower prices. The manufacturer in arguing for the purchase of standardized products is endeavoring to smooth out his factory load curve, and to provide against interruption of his manufacturing schedules."

LOOKING ASKANCE AT SPECIAL DESIGNS

Factories that are now overburdened with work look askance at orders for special articles which require new production programs. Regardless of the good intentions of the shop department, such orders are subject to constant sidetracking and are made to fit in with the general scheme of production as best they may. This is just the working out of human nature on the part of the individuals in the factory who must be relied upon to produce the articles.

Non-standardization and the manufacturing of small lots increases the shop cost, notably in the tool, jig and machine set-up costs. For example, figures are available on the cost of machining an armature thrust collar. This is an automatic machine job. The direct labor cost is about 18 cents per piece, but the cost to set up the machine preparatory to doing the work automatically is about $4.75. Thus the quantity put through has a great influence on the unit price. The same argument holds for the manufacture of practically all parts of a railway or industrial motor. Shop practice in this country is now at a stage where almost every part of a motor can be made in an automatic way cheaper than it can be made by any other method. Thus large lots are essential to low prices.

CO-OPERATION WILL REDUCE PRICES

The standardization of products is the result of co-operation between the manufacturer and the user, and the aim of the manufacturer should always be to develop the product which will be best suited to the service to be rendered and therefore most widely accepted. Because of the large sales of a standard product the manufacturer is enabled to distribute his engineering and development cost over a great number of units and thus keep the cost per unit low. Take, for example, the development cost of one of the most popular types of electric railway motors. This cost to the manufacturer was about $20,000, but since approximately 30,000 motors of this type were sold the development cost per motor was only about 66 cents. On some equally good motors the sales were smaller, due to restricted buying of equipment at the time the motors were introduced to the field. Thus the development cost per motor has been nearer $20 than 66 cents. This seems to be another illustration confirming the statement of motor manufacturers that the field has asked for a larger number of types of railway motors than operating conditions need. A restriction of this number will result in better motors at less cost to the producer and the purchaser.

According to one manufacturer, competition can be relied upon as the force which will urge the manufacturers to keep their products up to date. Thus standardization of a manufactured product will not delay progress. It can therefore be stated as a rule that not only for the present conditions but generally the purchaser will be benefited by limiting his purchases to articles standard with the manufacturers. These advantages are so great that railway buyers would do well not to allow prejudice and personal opinion to offset the advantages to be derived, unless the standard articles which are offered for sale are actually unsuited for the service for which they are intended.

Export Business Must Be Cultivated

"Many American manufacturers are enjoying an export business of considerable magnitude now. As long as the war lasts, the foreign purchaser, in many cases and to a great extent, will be forced to deal with the American producer. He has to accept the arbitrary terms and conditions imposed by the manufacturer here in order to get any goods at all. After the war, however, when the foreign purchaser again has several sources of supply available and the American producer is threatened with over-production and lack of demand, the circumstances will have to be different." These were the words expressed to a representative of this paper recently by the buyer in this country for a considerable amount of supplies for electric lighting and railway systems abroad. Continuing, the buyer said:

"An immense amount of educational work is required in this country in order to fit the great majority of American manufacturers for entering the foreign and export trade under circumstances that will give them even a 'look in' after the war, in competition with European concerns manufacturing the same goods. This is not due, by the way, to inferiority or want of merit in the products. Indeed, in these respects, the American manufacturer is not, as a rule, handicapped. He is handicapped, however, and quite seriously, by his very low coefficient of adaptability and his apparent indisposition, or lack of ability, to see things from the purchaser's point of view. The American manufacturer will have to become more tolerant, more accommodating and more adaptable if he wishes to retain any considerable portion of foreign trade. He must learn to extend credits when credits are warranted, and supply the apparatus ordered and not other apparatus which he considers just as good. He must also learn to pack and box his goods for foreign export. I realize the difficulties in the way of getting raw material under which manufacturers of electrical apparatus in this country are now struggling. I know that they are unable in many cases to make good deliveries even to domestic customers. But the point I wish to make is this: The foreign customer should be treated as well as the domestic customer, and the manufacturer should make an effort with export orders to take care of those minor points which cost the manufacturer little or nothing but make a great difference in the satisfaction which his products give when they reach the foreign field."

Standardizing Catalog Sizes

Bulletins, Photographs, Connection Diagrams, Specifications, Factory Forms and Correspondence Paper Included—Decreasing Width of Margin Effects Big Saving

BY MARTIN P. RICE

Manager Publication Bureau, General Electric Company

The General Electric Company took up the subject of standardizing the size of catalogs many years ago, and the plan has been carried further than in any other organization that I know of.

In the first place a size was selected solely because of inherent advantages, and not merely because it would cut conveniently from a size ordinarily furnished by paper mills. Our standard size is 8 in. x 10½ in., and we aim to publish everything except loose-leaf agents' handbooks in this size. We have also adopted it for correspondence paper, blueprints, photographs, diagrams of connections, specifications and factory forms. There is a great advantage in such uniformity; it facilitates filing and handling, and it is particularly advantageous when we write to customers inclosing our bulletins, connection diagrams, specifications or photographs—all these forms being uniform in size with the correspondence paper.

In recent years, there has been a great deal of discussion on standardization of size in catalogs. Opinions are gradually crystallizing and the size selected usually approximates ours. Some, however, specify 8½ in. x 11 in.

When it comes to a choice between 8 in. x 10½ in. and 8½ in. x 11 in., I think there are some good arguments for the smaller size; in fact, I can see no real good reason for making a sheet exactly 8½ in. x 11 in. Nearly all of the so-called 8½ in. x 11 in. sheets measure 8⅜ in. x 10⅞ in., because the 8½ in. x 11 in. size is merely an attempt to cut a certain number of sheets out of a paper maker's standard size. In other words, instead of considering the question of size solely on its merits and requiring paper manufacturers to meet the demands as we have done, some propose to adopt a size originated primarily for the paper maker's convenience. Let us see how it would work out for the General Electric Company.

An 8½ in. x 11 in. sheet contains 10 per cent more paper stock than an 8 in. x 10½ in. sheet. This additional stock is seldom utilized in either printed catalogs or in correspondence; it merely furnishes increased width of margin. During a normal year, this company uses about $120,000 worth of paper, so that the increased cost of the larger size would be about $12,000, for which we get nothing. There would also be a corresponding increase in postage, expressage and freight. It would probably cost the company not less than $25,000 a year to make such a slight change as an increase from the 8 in. x 10½ in. sheet to the 8½ in. x 11 in. sheet.

With the present scarcity of paper and consequent increase in prices, it is difficult to say how anyone can consistently advocate a standard size larger than necessary. It would be a violation of fundamental economic principles which just now would be particularly inexcusable.

Steel Corporation Sales Policies

Recent remarks of Elbert H. Gary, chairman of the board of the United States Steel Corporation, throw a light on the steel production situation as it has existed during the last twelve months. In commenting on the earnings Mr. Gary is quoted as having said that it was never the intent or purpose of the management to secure the highest prices possible. When prices were advancing the management has always endeavored to steady them and keep them within fair limits. The policy has been to exert a steady influence, no matter what the condition of the market might be. He further stated, "At the present time we are selling standard plates from $3.50 to $4 per 100 lb. to the general trade and at about $2.90 to the Government. We could sell the same product to the trade at from $8 to $10, the latter price having been recently bid.

When questioned about the trade outlook Mr. Gary said that there was no let-up in general business conditions and that the tendency is to advance prices. "Personally," he added, "I don't want to see them advanced."

"Our books are well filled with orders. We have more unfilled orders than ever before, and enough to keep us busy throughout 1917, and in addition we have sold considerable product for 1918. We could sell still more if we had it. At the present time we have about 270,000 employees of many different nationalities. Between 50,000 and 60,000 of them are stockholders."

Copper Market Quiet

Dullness has again developed in the copper metal market and inquiries which had been received earlier in the week have not resulted in actual orders.

In speaking of the most discussed feature of the copper market for the past month, which was the purchase by the government of 45,510,000 lb. of ingot copper at 16.67 cents per pound, the *Wire Message*, published by the Habirshaw Cable Company, Inc., and the Electric Cable Company, says:

"We have read several opinions to the effect that this concession would probably cause a general weakening of the market. We can see no logical reason why it should have this affect. The concession was an arbitrary measure, and will not change the law of supply and demand, which fixes the prices to the general public. The price quoted is for the quantity named to be delivered within twelve months. The concession in price does not apply to the demand for copper from our European Allies.

"Several factors have contributed to the softening of the market during the past month. Many consumers who ordered for future delivery have been unable to get the metal when expected, and have been obliged to buy spot copper to cover urgent needs. When the delayed copper arrived, some of it was offered for resale. High prices have stimulated preparations for unprecedented production. The result of these preparations was checked by bad weather, labor troubles, and inadequate transportation. With the return of more normal conditions an easier market was to be expected. How far it will recede from previous high levels, it is difficult to say.

"We believe the future price of copper must depend largely upon the demands of our government and its Allies during the next few months. Until this demand and the terms of sale are more definitely determined, we see no reason for a sudden decline in price such as took place some ten years ago. At that time high levels were due largely to speculation, to-day's prices are due to a legitimate demand for the metal and so long as the war continues we see no reason to anticipate a lessening in demand."

Second-Hand Market Strong

Although deliveries on most manufactured products have been set back a month or two months, because of the government's demands on the industries of the nation, no appreciable effect has been felt by the merchants in second-hand electrical goods except for very large apparatus, the demand for which has been enhanced to an appreciable extent. Second-hand dealers continue to experience a large demand for practically all classes of equipment. There is no shortage at the present time of second-hand electrical apparatus except for large equipment, such as large induction motors, rotary converters, transformers and turbines.

Steam engines, it is understood, are a drug on the market, there being no demand for this class of equipment.

The available machinery is for the most part in excellent shape. There is, of course, some poor stuff coming out, but owing to the price of copper it has been found to be more profitable to scrap the machines for old metal than to attempt to rewind or otherwise repair them to good operating condition.

The second-hand market in the future, in all probability, will depend largely on the copper market. If the price of copper continues high it is the belief of those engaged in the trade that second-hand dealers should experience an excellent business. On the other hand, should a readjustment of the copper market bring prices down nearer their level in normal times, the indications point to a poor second-hand market.

NEW YORK METAL MARKET PRICES

	March 31	April 28
Prime Lake, cents per lb	35	30
Electrolytic, cents per lb	35½	30
Copper wire base, cents per lb	42	39
Lead, cents per lb	9½	9⅖
Nickel, cents per lb	50	50
Spelter, cents per lb	10¾	9¼
Tin, straits, cents per lb	55⅞	57½
Aluminum, 98 to 99 per cent, cents per lb	55	57

OLD METAL PRICES

	March 31	April 28
Heavy copper, cents per lb	29	26¾
Light copper, cents per lb	24¾	23
Red brass, cents per lb	20	19½
Yellow brass, cents per lb	19	18½
Lead, heavy, cents per lb	8	7¾
Zinc, cents per lb	8	7
Steel car axles, Chicago, per net ton	$38	$41.50
Iron car wheels, Chicago, per gross ton	$22	$24
Steel rail (scrap), Chicago, per gross ton	$27.50	$31.50
Steel rail (relaying), Chicago, per gross ton	$34	$39
Machine shop turnings, Chicago, per net ton	$9.50	$10.50

CURRENT PRICES FOR MATERIALS

	March 31	April 28
Rubber-covered wire base, New York, cents per lb.	42	39
No. 0000 feeder cable bare, New York, cents per lb.	42	39
No. 0000 feeder cable stranded, New York, cents per lb.	39¾	39½
No. 6 copper wire (insulated), New York, cents per lb.	39½	36½
No. 6 copper wire (bare), New York, cents per lb.	42	39
Rails, heavy O. H., Pittsburgh, per gross ton	$40	$40
Rails, heavy Bessemer, Pittsburgh, per gross ton	$38	$38
Wire nails, Pittsburgh, per 100 lb	$3.20	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.65	$3.85
Steel bars, Pittsburgh, per 100 lb	$3.75	$3.75
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$4.85	$5.85
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$6.55	$7.05
I-beams over 15 in., Pittsburgh, cents per lb	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	4.05	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.85	4.15
Cement (carload lots), New York, per bbl	$2.02	$2.12
Cement (carload lots), Chicago, per bbl	$2.06	$2.16
Cement (carload lots), Seattle, per bbl	$2.60	$2.60
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.11	$1.21
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.02	$1.22
White lead (100 lb. keg), New York, cents per lb.	10¼	10¾
Turpentine (bbl. lots), New York, cents per gal.	45	51

ROLLING STOCK

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., is reported to be considering the purchase of cars.

Conestoga Traction Company, Lancaster, Pa., has purchased eight city cars from The J. G. Brill Company.

Gary & Interurban Railroad, Gary, Ind., through its receiver, has been authorized to issue $192,000 of receiver's certificates of which $114,000 will be used in improving Gary's street car service. The improvements include the purchase of additional cars and equipment.

Illinois Traction System, Peoria, Ill., noted in the March 31 issue as having ordered fifteen double-end city motor cars from the St. Louis Car Company, has specified the following details for these cars:

Number of cars ordered	15
Road	Peoria Railway Co.
Builder	St. Louis Car
Type	Double-end city motor
Seating capacity	40
Weight (total)	36,500 lb.
Bolster centers, length	17 ft. 0 in.
Length over bumpers	41 ft. 0 in.
Length over vestibule	40 ft. 0 in.
Width over all	8 ft. 2 in.
Rail to trolley base	11 ft. 4⅝ in.
Body	Semi-steel
Interior trim	Polished bronze
Headlining	Painted three-ply veneer
Roof	Plain arch
Air brakes	Westinghouse
Car trimmings	St. Louis Car
Conduits and junction boxes	St. Louis Car
Control	Type GE
Curtain fixtures	Curtain Supply
Curtain material	Pantasote
Designation signs	St. Louis Car standard
Door mechanism	St. Louis Car standard
Fenders	Berg fenders
Hand Brakes	Patt. vertical wheel
Heaters	Consolidated electric
Headlights	Incandescent-Crouse-Hinds
Journal boxes	A.E.R.A. standard
Motors	Four GE 258-A, inside hung
Paint	Paint and varnish
Registers	International R-5
Sanders	St. Louis Car air sanders
Sash fixtures	St. Louis Car standard drop sash
Seats, style	Longitudinal
Seating material	Rattan
Step treads	Empire safety
Trolley catchers or retrievers	Ideal
Trucks	Double, archbar
Ventilators	St. Louis Car
Wheels (type and size)	24-in. chilled iron

Public Service Railway, Newark, N. J., noted in the ELECTRIC RAILWAY JOURNAL of Jan. 27 as ordering fifty open and 100 closed cars from the Cincinnati Car Company, has specified the following details for this equipment.

Number of cars ordered	100 closed	50 open
Delivery	Summer and Fall, 1917	May and June, 1917
Builder	Cincinnati Car	Cincinnati Car
Type	Passenger, not convertible	Open
Capacity	50	96
Weight (total)	42,276 lb.	37,890 lb.
Bolster centers, length	24 ft. 6 in.	24 ft. 0 in.
Length over bumpers	50 ft. 10 in.	48 ft. 0 in.
Length over vestibule	50 ft. 2 in.	47 ft. 4 in.
Width over all	8 ft. 7 in.	8 ft. 5 in.
Height, rail to trolley base	11 ft. 2¼ in.	11 ft. 9 in.
Body	Semi-steel	Steel underframe
Interior trim	Cherry	
Roof, arch or monitor	Arch	Arch
Air brakes	GE straight air	GE straight air
Control, type	25—HL 75—HLD	P.C.
Designation signs	Hunter	Hunter
Fare boxes	Johnson	
Wheelguards	HB life guards	HB life guards
Heaters	Electric	
Headlights	Incandescent	Incandescent
Motors, type and number	25—West. 307 CV 75—West. 514	GE 200
Motors	Outside hung	Outside hung
Seats, style	Longitudinal	
Seating material	Rattan	Wood
Trucks, type	25—Standard 0-45 75—Standard 0-50	Standard 0-50
Wheels	Chilled iron 30 in.	Chilled iron 33 in.

Tacoma Railway & Power Company, Tacoma, Wash., noted in the March 31 issue as having had twenty-eight single-end one-man cars purchased for it by the Stone & Webster Management Association, Boston, Mass., has specified the following details for this equipment. In addition to the twenty-eight single-end cars ordered, four double-end cars, identically the same as the above with the exception of the double end, have also been ordered from the American Car Company.

Number of cars ordered	28
Builder	American Car
Type	Single-end one-man
Seating capacity	36
Length over bumpers	27 ft. 9½ in.
Length over vestibule	26 ft. 9½ in.
Width over all	8 ft. 0 in.
Rail to trolley base	12 ft. 6 in.
Body	Semi-steel
Interior trim	Statuary bronze
Headlining	None, rafter finish
Roof	Arch
Air brakes	Westinghouse
Axles	Brill
Bumpers	American Car
Car trimmings	Brill
Control	Type K-10
Couplers	American Car pull bar
Curtain fixtures	Curtain Supply
Curtain material	Pantasote
Designation signs	Hunter
Door-operating mechanism	American Car
Fare boxes	Johnson
Gears and pinions	GE
Hand brakes	American Car, with Pittsburgh drop handle
Heaters	Consolidated
Headlights	Golden Glow
Journal boxes	Brill
Lightning arresters	GE
Motors	Two GE 258-C, inside hung
Sanders	Keystone
Sash fixtures	O. M. Edwards
Seats	Heywood Bros. & Wakefield 6-P stationary
Seating material	Steel mahogany, wood and canvas lined
Springs	Brill
Step treads	Feralun
Trolley base	GE
Trolley catchers	Keystone
Trolley wheels	GE
Trucks	Brill, type 78-M-1
Ventilators	Utility automatic, small size
Wheels	24 in., 2½-in. tread, ⅝-in. flange

Wichita Railroad & Light Company, Wichita, Kan., noted in the Feb. 7 issue as having ordered fifteen light-weight, single-truck, single-end cars from the St. Louis Car Company, has specified the following details for this equipment:

Number of cars ordered	15
Builder	St. Louis Car
Type	Light-safety city car
Seating capacity	41
Weight (total)	16,000 lb.
Over bumpers	29 ft. 7½ in.
Over vestibule	29 ft. 0 in.
Width over all	7 ft. 11 in.
Rail to trolley base,	11 ft. 5 5/16 in.
Body	Semi-steel
Interior trim,	Malleable iron, painted
Headlining,	Painted, three-ply veneer
Roof	Plain arch
Air brakes	Westinghouse
Bumpers	St. Louis Car pressed
Car trimmings	St. Louis Car
Conduits and junction boxes,	St. Louis Car
Control	Type GE K-10
Couplers,	Bar type, with draw heads
Curtain fixtures	Curtain Supply
Curtain material	Pantasote
Designation signs,	St. Louis Car standard
Door mechanism	Air operated
Fare boxes,	Woods' non-recording
Fenders or wheelguards,	St. Louis Car lightweight
Hand brakes,	Drop handle, St. Louis Car
Heaters	Peter Smith hot air
Headlights	Golden Glow
Journal boxes	A.E.R.A. standard
Motors	Two GE 258-A
Motors	Inside hung
Paint	Paint and varnish
Registers	International R-5
Sanders,	St. Louis Car air operated
Sash fixtures	St. Louis Car
Seats, style,	Hale & Kilburn, stationary cross-seat
Seating material	Rattan
Step treads	Empire safety
Trolley catchers	Keystone
Trucks,	St. Louis Car single cantilever
Ventilators,	St. Louis Car Peerless
Wheels (type and size),	24-in. chilled iron

TRADE NOTES

St. Louis (Mo.) Electrical Works has changed its address to 4060 Forrest Park Building.

Railway Car Manufacturers' Association, New York, N. Y., has established an office at 61 Broadway, room 2216.

Acme Supply Company, Chicago, Ill., announces that Thomas Dunbar, Sr., has been made president of the company, H. H. Schroyer having retired.

Philadelphia (Pa.) Holding Company has received an order from the East St. Louis & Suburban Railway for one radial truck.

Safety-Armorite Conduit Company, New York, N. Y., has removed its New York offices to 511 West Twenty-seventh Street, where it will be in connection with the company's new warehouse.

National Conduit & Cable Company, New York, N. Y., announces that new financing, which has been made necessary by increased business, will provide $1,500,000 additional working capital. The company's business, which consists of supplying telegraph and telephone appurtenances, has netted an average profit of $2,500,000 yearly. The Underwriting Syndicate includes Millett, Roe & Hagan and Pritchett & Company, the National City Company, and Montgomery, Clover & Tyler.

Dr. Robert Grimshaw, special agent of the Department of Foreign and Domestic Commerce, whose early trip to South America to report on opportunities for American manufacturers in that country was mentioned in these columns last week, expects to sail about May 28. Prior to this time he will visit a number of the manufacturing cities in New England, as well as Syracuse, Buffalo, Cleveland, Toledo, Chicago, Cincinnati and Pittsburgh to discuss matters relating to export trade with interested manufacturers. The field in South America which he will especially investigate is that of metal and wood-working machinery, prime movers and electrical apparatus, also the methods adopted in the different countries for getting bids and awarding contracts for government and municipal supplies, as mentioned last week. Dr. Grimshaw has written extensively on mechanical engineering subjects for American periodicals, and for twenty years prior to the war resided in Germany, where he was consulting and mechanical engineer for the Bavarian and Bohemian governments. At present he may be addressed in Room 409, Custom House, New York.

ADVERTISING LITERATURE

W. N. Matthews & Brother, St. Louis, Mo., have issued a bulletin describing and illustrating their type F Matthews Woodpecker Telefault.

National X-ray Reflector Company, Chicago, Ill., is distributing a bulletin entitled "How to Know and Have Good Lighting." Illustrations of well-known places which use X-ray reflectors are given.

Electric Storage Battery Company, Philadelphia, Pa., has issued catalog KXS, describing its latest type of portable battery for railway signal service. This battery has been especially designed to give sixty-day service on one charge with very little increase in weight, as compared with types heretofore used for thirty-day service. The plates, separators, jars, covers and carrying cases are of especially rugged construction. This company's double-flange cover and automatic filling and vent plug are important features, eliminating the escape of acid spray during charge and preventing slopping of acid over the tops of the cells while filling.

International Steel Tie Company, Cleveland, Ohio, has issued an instructive catalog of its products, showing the manner of installation and construction details of the steel crossing foundations and steel twin ties by photographs and drawings. Various applications of these two products are pictured in the catalog, as used on a number of properties. The actual saving which results from the use of steel twin ties in permanent track construction in paved streets, as compared with the use of wooden ties in similar construction, by virtue of the greater bearing area with less quantity of concrete, is explained in detail, as are also the advantages due to prolonging the joint life and to cutting the labor cost. Certain recommendations as to the depth and quality of concrete to be used, based upon the experience of a number of companies, are also included in the booklet, thus rounding out the information desired by any maintenance-of-way engineer when considering the use of twin steel ties for high-grade track work.

New Publications

The "Mechanical World" Electrical Pocket Book for 1917. The Norman, Remington Company, Baltimore, Md. 240 pages. Price 45 cents, postpaid.

In this year's handbook a lengthy section on electrical measurements and testing has been added. Other new sections include those on transmission line calculations and on wiring systems. The handbook is written in a concise, practical manner, with illustrations only where needed to make the subject matter readily understood. It is of a size convenient for constant pocket use and its utility is increased by a forty-six-page diary in the back.

Railway Strikes and Lockouts.—United States Board of Mediation and Conciliation. Superintendent of Documents, Government Printing Office, Washington, D. C. 367 pages. Paper, 30 cents.

This work is an impartial comparative analysis of world legislation relative to the adjustment of public-utility labor disputes. While it is not a critical study of the efficacy of the laws in different countries, it presents valuable operating details and official data from which the reader can draw his own conclusions. The work is a useful compendium of information on a subject of increasing importance in the United States.

Resistance of an Oil to Emulsification. Bureau of Standards Technologic Paper No. 86, by W. H. Herschel. Government Printing Office, Washington, D. C. Thirty-seven pages. Ten cents per copy.

This paper gives the theory of the subject, and also tests of the emulsifying properties of oil. The statement is made that the subject is of greatest importance in connection with high-speed engines and steam turbines, because emulsification interferes with the filtering of the oil in the circulatory system, and may thus prevent proper bearing lubrication.

Interior Wiring. By Arthur L. Cook, head of department of applied electricity, Pratt Institute, Brooklyn, N. Y. John Wiley & Sons, Inc., New York, 416 pages. Semi-flexible leather. Price, $2 net.

This book is intended as a guide to modern practice in electric lighting and power applications and in the design and installation of the wiring for such purposes. Numerous halftones and diagramatic illustrations help so to present the matter as to make it readily understandable by superintendents and operators of electrical installations and wiremen, who may be called upon to make extensions to or changes in existing installations, and who need definite information as to the best method of procedure. It is also adapted for use in schools to supplement shop instruction.

Electric Railway Journal

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Consolidation of Street Railway Journal and Electric Railway Review

Vol. XLIX NEW YORK, SATURDAY, MAY 5, 1917 Number 18

RAILWAYS CAN HELP SELL NEW BONDS

One of the large public utility holding companies has empowered each of its subsidiaries to supply information to its public in regard to the new government loan and to receive and handle subscriptions for this loan without charge and without profit. This is a patriotic act and is one which many electric railway companies, especially those in the smaller communities which are without banking facilities, could do with benefit both to the government and to the people in the communities through which they run. Secretary McAdoo has announced that the details for utilizing the service of these outside agencies in securing an extended sale of these bonds are being worked out and will be made public later. Other electric railway companies which do not have the facilities for handling subscriptions could advertise the bonds in their waiting stations and on their cars. To secure this being done in the most effective way, an offer has been made to the Secretary of the Treasury in behalf of the national street-car advertising operators of free card space to advertise the bonds or for any other purpose which he may desire. Owing to the size of the first issue, $2,000,000,000, the loan must be a popular one and this means that every facility should be offered so that subscriptions can be made easily.

"HAVE YOU BOUGHT YOUR BOND?"

The American people are not as familiar with government loans as are the people abroad. This is partly because of the small amount of government debt outstanding, partly because in our developing country there have been many other opportunities for investment and partly because many of the earlier government loans formed the basis for the issue of banknotes and thus were held largely by the banks. Nevertheless, the conditions surrounding this loan, such as exemption from federal and state taxation, except estate and inheritance taxes, and the privilege of conversion into bonds bearing a higher rate of interest, if the government issues any such bonds during the present war, make it a very attractive one. Our cartoon on page 812 emphasizes the reason for the loan. The question which it asks is, "Have you bought your bond?" This is a question which every patron of an electric railway as well as every individual connected with an electric railway company should be able to answer affirmatively in the near future or to give a good reason for not having done so. In such cases, employing companies, whether railway or manufacturing, may offer to assist by making advances to the employee to be repaid gradually by deductions from wages or salary payments. This practice was followed by a great many British firms in connection with the recent large British loan and appears to have been of great assistance. This war will have to be won quite as much by bank checks as by bullets, and it is the duty of all to help.

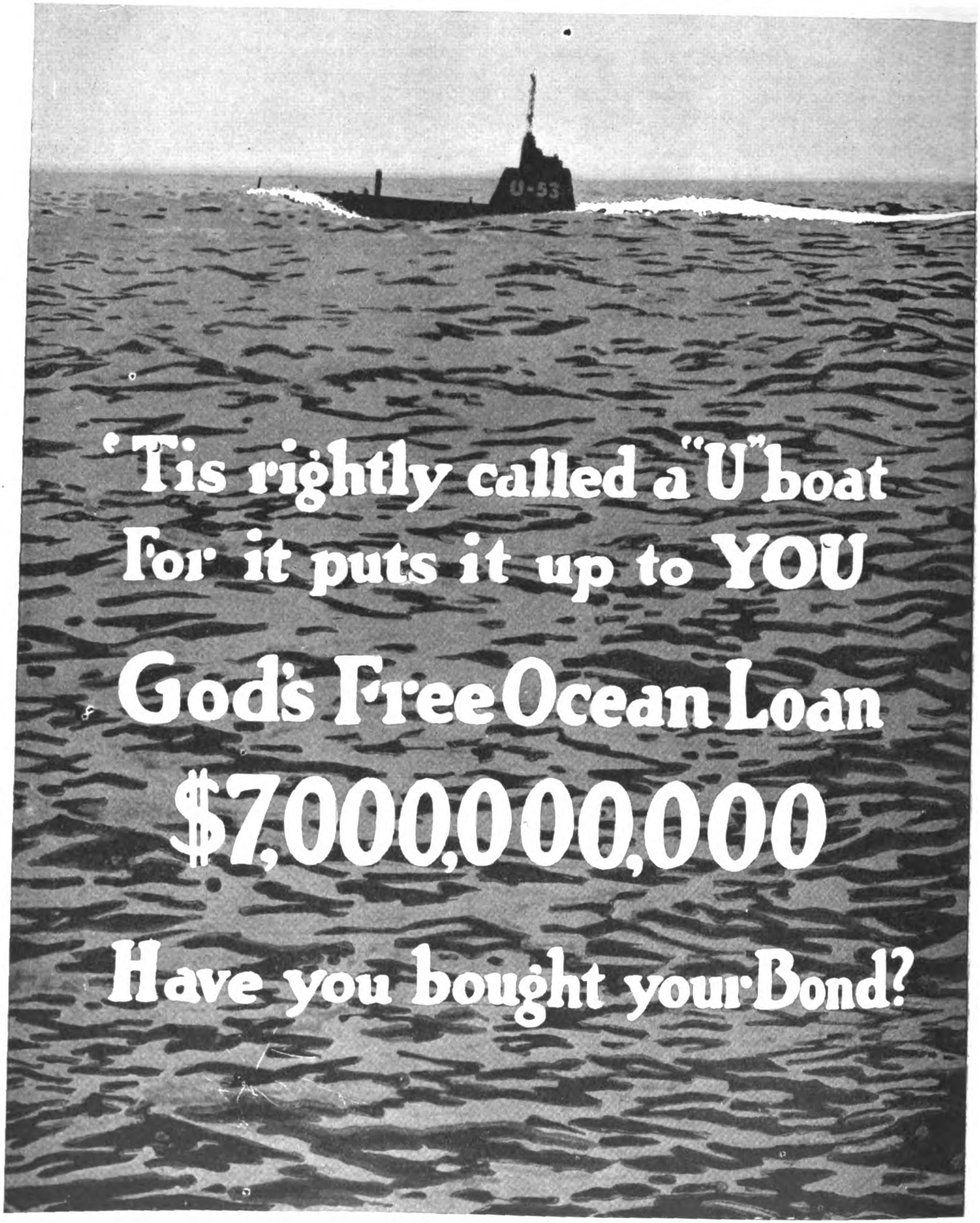
BETTER MEDICAL RELATIONS

Better public relations are not created solely by newspaper advertising, by courteous office boys and attentive officials, by car posters or what not. They are the result of frankness, sincerity, truth and understanding in all phases of a corporation's life. Take, for example, the medical side of an electric railway. That does not mean much to the average citizen, but it can be made a powerful aid in improving relations with patrons and employees. This week Dr. Holtz describes in our columns what the Associated Bureaus of the Pittsburgh Railways have accomplished along this line, and the story is most inspiring. The company has a medical code as strict as that of any practitioner; it handles its medical affairs in an open and dignified manner; it co-operates with rather than antagonizes the local physicians—and the result is a valuable asset, the good-will of the entire medical profession. In the case of the employees, the work of giving direct medical and welfare aid is handled with the same enlightened thoroughness. To bring "ambrine" from the battlefields of Europe was not a great task, but what a protective interest in the employees it manifested. When the Pennsylvania compensation law went into effect in 1916, the company did not have to make any material alterations in its medical practices—the act had been anticipated by many months! These are merely incidents, but they are typical. The Associated Bureaus of the Pittsburgh Railways are building their house upon the rock of better public relations, and it will stand.

REMEDYING THE COAL SITUATION

From nearly every section of the country comes the complaint from public utility companies that coal is as difficult to get as in mid-winter. Some electric railway companies, profiting by the experience of the last twelve months, have taken the bull by the horns and purchased their own coal mines, but obviously this is impracticable for most electric railways. It is to be hoped that the ruling just issued by the special committee on national defense of the American Railway Association to give preferred movement to shipments of coal and iron ore will help in this emergency. Beginning May 1 all railroads handling, loading and distrib-

The Nation Needs Money


U-53
'Tis rightly called a "U" boat
For it puts it up to YOU
God's Free Ocean Loan
$7,000,000,000
Have you bought your Bond?

Suggestive Thoughts on This Cartoon Will Be Found in the Editorials on the Previous Page Entitled "Railways Can Help Sell New Bonds" and "Have You Bought Your Bond?"

uting gondola and hopper cars are admonished to observe this rule, and the committee will look to the president of each road personally to see that this order is not evaded or abused. This act and the proposed horizontal increase in freight rates will probably do more to improve the steam railroad freight situation than any of the many other remedies that have been proposed. So far the proposed freight rate increases have not included coal, coke and iron ore. But it is not improbable that in the early future the tariffs on these commodities will be considered for increase on the basis of so many cents per ton. The possibility of any new factor which will increase the cost of fuel for public utility use will create another cause of worry to electric railway coal users, and particularly so because, unlike manufacturers, they are not in position to pass on the cost easily to the "ultimate consumer."

A FREAK ORDINANCE AT LOS ANGELES

Los Angeles, so wide awake on other matters, allowed the passage on April 24 of an ordinance that is a prize for the ignorance it displays of electric railway operation. Section 10-a actually says: "It shall be unlawful . . . to replace or repair the rails . . . or ties . . . or to repair, replace or reconstruct the roadbed, pavement or wearing surface . . . within said business district for any such purpose, between the hours of 7 o'clock p. m. and 6 o'clock a. m." On reading the hours, anyone who is unfamiliar with the facts would naturally assume that the printer had reversed the p. m. and a. m. designations; but, no, the ordinance has been quoted correctly. Just how an electric railway can keep up its track in the busiest part of the city during the hours when the streets are congested with cars, automobiles, wagons and pedestrians, if it is not allowed to make repairs and renewals at night is something which we must leave to the councilors and Mayor in their profound wisdom. We hope that the Los Angeles and Pacific Electric Railways will find some way of exposing such stupidity. The citizen who finds Broadway or Main Street torn up in the middle of the day will doubtless excoriate the railways instead of the Council for failing to do such work when he is fast asleep in Pasadena or some other suburb. Such undeserved misunderstandings are among the many things which make an electric railway operator's life "of few days and full of trouble."

SAVINGS POSSIBLE IN THE COAL PILE

The heart-breaking waste of energy between the coal pile and the wheel tread has worried electric railway economists whenever they have stopped to consider it. Heretofore, it has been an individual matter with each company, but now the importance of reducing unnecessary coal consumption has become a national question. On the average probably less than 5 per cent of the original energy gets to the place where it acts to drive the car. Much of the 95 per cent loss is inevitable, but some of it can be prevented by applying the results of engineering research. Even when the energy reaches the wheel tread it is far from the goal, for still perhaps a fifth of it is doomed to preventable waste. Furthermore, while coal is the principal element of energy production expense, the labor along the line from coal pile to wheel tread also presents elements of loss. These are difficult to evaluate in numbers, but are worthy of careful attention. In these days of enforced economy in the electric railway field it behooves us all to have firm convictions regarding the actual situation in this matter of preventable waste. The facts must somehow be brought home to the men who ultimately control the expenditure of the energy; to executives first, then to boiler and engine-room operatives, to substation attendants and finally to the men on the front car platforms, who are the "ultimate consumers." All of these men must be shown how they can contribute to a general saving, and their successful efforts in doing so must in some way be recognized and rewarded. They must all be made to feel that even if sensational results are not possible, a little saving here and there will contribute to a creditable whole. Incidentally the co-operative spirit which will be fostered by concerted effort in this direction will produce corresponding benefits in others.

ELECTRIC RAILWAY EARNINGS COMPARED

On March 31 we published figures compiled by the information bureau of the American Electric Railway Association, showing that in the calendar year 1916 electric railway revenues displayed considerable improvement over those of 1915. For 7910 miles of line the gross earnings amounted to $207,520,000, an increase of 6.34 per cent, while the net totaled $78,333,000, a gain of 5.78 per cent. This week we are publishing in our Financial Department additional figures from *The Commercial & Financial Chronicle*. For 294 companies the 1916 gross earnings amounted to $582,697,750, an increase of 9.65 per cent, and the net earnings at $219,236,230 represented a gain of 9.18 per cent. Both compilations include street, suburban and interurban railways. No comparison by miles of line or number of companies is available, but the greater scope of the financial journal's figures is apparent from its report of gross earnings more than two and a half times as large as the association's total.

That more satisfactory progress is indicated by the larger gross returns is encouraging, but it must be remembered that the gain made in 1916, a year of marked industrial prosperity, was large only as compared with those in the preceding two years. If we group the last three years together we find that the average annual percentage gain in gross was only 3.43 per cent, as compared with an average of 7.12 per cent for the preceding nine years, or from 1905 to 1913 inclusive. With increasing costs and taxes, with vast governmental competition for capital, the electric lines must be assured a better return in the future if they are to be able to attract new capital. The whole nickel-fare proposition needs a fundamental readjustment to modern conditions. Conditions are not improving, and the more quickly this change is made, the better.

A Resolution of the American Electric Railway Association

Passed April 30, 1917

"WHEREAS, the President in a proclamation to the people of the United States, has urged the conservation of all resources and the devotion of all energies to the sole purposes of bringing victory to the arms of the Nation in the war upon which it has so justly entered, and

"WHEREAS, to the managers and operatives of the transportation systems of the country, the President addressed the following particular admonition:

> *To the men who run the railways of the country, whether they are managers or operative employees, let me say that the railways are the arteries of the Nation's life and upon them rests the immense responsibility of seeing to it that those arteries suffer no obstruction of any kind, no inefficiency, or slackened power; and*

"WHEREAS, this Association at its Midyear Conference pledged to the President, as the representative of the country, 'its patriotic support of all measures which you may take in upholding the dignity and honor of our country and the rights, property and persons, of its citizens on land and sea,' and

"WHEREAS, the efforts and energies of all electric railway officers, should in these times of stress be devoted to preparation of their systems for the added demands, both military and industrial, which may be made upon them and

"WHEREAS, the resources of the Manufacturer Members of the Association are at any time liable to call from the Government in the furtherance of its military plans, and the preparation of the customary convention exhibit entails an expenditure of time and money, which may well be devoted to objects more directly concerned with the public need, be it

"RESOLVED, by the Executive Committee of the American Electric Railway Association that the Convention and Exhibit of the Association, in its usual form, be abandoned for the year 1917 and that the Committee communicate to the Member Companies at a later date, the call for such meeting as may at the time seem proper to substitute, and be it further

"RESOLVED, that the Executive Committee in behalf of the Association, pledges anew its patriotic support to the Nation, and accepts in behalf of its Member Companies the trust imposed upon the Transportation agencies of the country, by the President, in so far as it applies to electric railways."

Approve Plan of No Convention

AFTER the committee appointed to consider the plan of a convention this year had made the report published in the adjoining column, requests were sent to seven prominent members of the association for their individual views. These replies appear below:

CO-OPERATION WITH GOVERNMENT ALL-IMPORTANT

The present national crisis presents so many unusual problems, both local and national, that the association can more than ever justify its existence by aiding all its members in doing big things, and, also through active co-operation with the National Council of Defense, it can be of great value to our Government. To accomplish the best results it is necessary that each and all of us limit our activities to the consideration of the problems arising out of the present crisis.

L. S. STORRS.

New Haven, Conn., April 30.

* * *

BEST EXHIBIT THIS YEAR INCREASED EFFICIENCY

The abandonment of the convention and exhibit of the association in its usual form is in line with our pledge of support to the nation and will have the indorsement of all our membership. We can, as an association, put on our greatest exhibit this year by working together for increased efficiency in our business.

JOHN J. STANLEY.

Cleveland, Ohio, May 1.

* * *

HIGHLY PROPER UNDER EXISTING CIRCUMSTANCES

The abandonment of the annual convention of the American Electric Railway Association is highly proper under existing conditions. We can all serve our country, the public and our companies better by devoting our energies along other than convention lines. The recommendation should be approved.

J. H. PARDEE.

New York, April 30.

* * *

LARGE CONVENTION INCONSISTENT WITH PRESENT PURPOSES

Conservation of food, fuel and labor are of pressing importance. Greater production was never more urgently needed. The members of the American Electric Railway Association should direct every effort toward giving our nation all possible assistance, and conserving the time of their officials and employees for the urgent requirements of our participation in the World War. The usual large convention would be inconsistent with our present purposes.

J. D. MORTIMER.

New York, May 1.

* * *

ACTION TAKEN WAS MOST WISE

The executive committee of the American Electric Railway Association has acted most wisely in determining to forego a convention this fall. The state of war with which this country is now confronted requires that public utility men "do their bit" in preparing this country for the strife that will test its men and resources to the limit. In addition to the regular duties, there is a real work for the public utility men along this line.

C. LOOMIS ALLEN,

Syracuse, N. Y., May 1.

* * *

MANUFACTURERS SHOULD CO-OPERATE WITH RAILWAYS

I heartily approve the proposed plan to abandon this year holding of the A. E. R. A. convention. The national situation is such as to make it imperative for everyone to remain at his post of duty, and make preparations to handle adequately the transportation of men and supplies that will devolve upon the electric railway companies. The network of electric railway lines in this country will prove a valuable asset to the government and a strong arm of the military service. Therefore, it is essential that railway officials bend every effort toward perfecting their organizations to meet the emergency. The manufacturers can also lend valuable assistance to the industry by making plans to insure maximum production in order to furnish the railways with material when it is required to keep the equipment in operation, thereby doing their bit toward achieving the victory that must be ours. I earnestly urge the manufacturers to co-operate with the electric railways to the end that our industry may develop its maximum efficiency as a military aid.

THOMAS FINIGAN.

San Francisco, May 2.

* * *

PLAN SHOULD RECEIVE SUPPORT OF MANUFACTURING MEMBERS

It is eminently proper to omit the convention this year, and I want to register my strong indorsement of the action taken by the executive committee. Everyone must realize the urgent necessity of giving all support to any agency that can be of such inestimable value to our government at this time as the electric railways will be. For this reason I am convinced that the abandonment of the convention will not adversely affect the membership of the association to any appreciable extent among the manufacturing members.

B. A. HEGEMAN, JR.

New York, May 1.

"FIND A WAY OR MAKE ONE"

Reference has already been made in these columns to a talk which was delivered recently before the employees of the Public Service Railway by Martin Schreiber on the subject of essentials for personal progress. Several hundred men listened to this talk with great interest, and even a casual observer could note that the words of the speaker aroused a responsive chord in the minds of his auditors. After all there is no more absorbing and profitable line of thought for anyone, in however unimportant a position, than that which directs him to greater opportunity and greater recognition. Starting from correct premises this line of thought will always lead to the conclusion that promotion is reasonably sure to the man who, while doing well the task on which he is at the moment engaged, is fitting himself for one a little higher up, and that nothing demonstrates better a man's fitness for promotion than his ability to get results under unusual and unexpected conditions. In the address referred to, the speaker cited, as examples of his main contention, cases of a dozen prominent officials of the local property whose careers showed consistent progress upward from comparatively unresponsible service. Undoubtedly every electric railway could furnish an impressive number of similar examples.

In studying the biographies of such men it cannot but be clear that their success has been due not so much to favoring fortune as to intelligent persistence in the face of difficulty. "Find a Way or Make One" is a fit slogan for the office boy who hopes some day to be president of the company, as well as for him who has already reached that high office.

WHAT MAY THE RAILWAYS EXPECT?

Now that an army of suitable strength has been assured to the country through the passage of the conscription law, it is pertinent to consider what effect the consequent withdrawal of a couple of million men from productive employment is going to have upon the electric railway industry. At least an approximate answer is to be found in the experiences of the Canadian railways, which have been going through this kind of economic readjustment for nearly three years and have most of their operating features in common with the electric railways of the United States. An outline of the conditions in Canada appears upon another page of this issue, and from this it is evident that no fear of a great disturbance need be felt by the railways on this side of the border.

Canada has raised an army that includes very nearly 6 per cent of the total population, and this figure is three times that generally mentioned as required from this country, so that on the face of it the disturbance here should be only one-third as great as it has been in the Dominion. As a matter of fact, many of the effects of the war have already been discounted here. Principal among them are the major part of the increases in wages, in living costs and in costs of materials which have been registered in Canada since the war began in 1914. As for the withdrawals of employees that are taken into the army, the Canadian railways' average loss was about 20 per cent and in this country the proportionately smaller army should reduce this figure to the order of only 7 per cent. What our electric railways face, therefore, is not a great disturbance, but rather a period wherein every source of economy must be exploited.

NO BIG CONVENTION FOR 1917

The action of the executive committee of the American Electric Railway Association in deciding not to hold a convention of the usual type cannot but commend itself to every interested patriot. Much as the omitted features of the convention will be missed it is far better to omit them than to raise any question of fitness or propriety. The best energies of the industry are needed on the job at home, especially during these days of uncertainty and anticipation. In addition the transportation facilities of the country will be taxed even further than ever next fall, if that is possible, in handling food, fuels, war supplies and other raw and manufactured products for our allies and ourselves. While in the aggregate the cost of a convention is a very small proportion of the country's annual expenses yet it is something, and the very fact that the railway men are willing to forego their convention will serve as an evidence of loyalty to their government.

Furthermore a convention, however desirable, is not essential to the prosperity of the railway industry. While it affords a splendid opportunity for the study of exhibits showing the latest products of the manufacturers, and for conference on operating and other problems, there are other although less efficient ways of accomplishing these things.

It is true that in the past the chief functions of the manufacturers at the convention have been to prepare the great annual exhibit and to assist in the entertainment of the delegates, and therefore the omission of these features will leave them with little to do this year. It is further true that since their admission to the association as company members in 1915 their status has not been defined so far as actual work is concerned. It must be remembered, however, that the problem of defining this status is a difficult one, and that a representative committee is diligently at work on its solution. We believe, therefore, that the manufacturers will stand loyally with the other members of the association in spite of the fact that their convention activities will be comparatively nil this year. The industry—operators and manufacturers—is behind the President to a company and to a man. Through the association they can most powerfully make their influence effective.

There is no lack of evidence that the electric railway men as a class are pre-eminently patriotic. The notes which are being printed in these columns from week to week reflect this patriotism. The decision to abandon the convention still further reflects it. Never was there such an opportunity to convince the country of our solidarity, and of our desire to "do our bit" in the service of that country, than is presented to us now.

Best Medical Attention Pays

How the Pittsburgh Railways and Affiliated Companies Have Built Up Cordial Relations with Local Physicians—How the Companies Care for Injured Employees and Promote Their Welfare

By W. M. HOLTZ, M. D.
Chief of Medical Bureau Pittsburgh (Pa.) Railways

THE medical and welfare bureaus of the Pittsburgh Railways, Duquesne Light Company, Beaver Valley Traction Company and Beaver County Light Company are part of the organization of the Associated Bureaus of these companies, all under the direction of Cecil G. Rice, assistant to the president. Their present activities are the outgrowth of eight years of careful planning by Mr. Rice. The chief of each bureau is responsible for the successful termination of specialized duties, backed by clear-cut policies and generous encouragement in any direction tending to promote greater efficiency. They receive from and give to the several other bureaus the utmost of functionally co-operative assistance.

RESULTS SPEAK FOR THEMSELVES

"The medical affairs of the Pittsburgh Railways and its affiliated companies are administered in a dignified, fair and honest manner which is recognized and credited by those who in past years were inclined to criticise. The full measure of what this means may be judged by considering that in every accident involving the traveling public and an electric transportation company there are from one to four or five physicians directly or indirectly concerned. Their influence to secure justice is well worth cultivating, and it is believed that in the district served by these companies a wonderful asset has been established in this way."—Dr. Holtz.

MEDICAL STAFF ORGANIZATION

All matters involving the medical profession and hospitals are handled through the medical bureau. The all-time staff of this bureau consists of a chief and two medical associates, a secretary-nurse and one clerk. There are, in addition, a corps of fifteen assistant physicians and surgeons, known as "welfare doctors"—not company doctors in any sense of the word—who are chosen on a basis of ability, experience and proximity to terminals and shops.

These welfare doctors are located at convenient points throughout the system of the various companies in three large and populous counties. To these medical men are assigned any unusual emergency, or the care of injured employees who may be unable to present themselves at the medical bureau's central office. These doctors receive no stipulated fee per month, but are paid for the professional services actually performed, at a rate sufficient to make the company's work attractive to them.

BUILDING UP CORDIAL RELATIONS WITH PHYSICIANS

One of the most important functions of the medical bureau is the upbuilding and preservation of cordial relations between the companies and about 3000 physicians and a dozen hospitals, with whom the business arising out of accidental occurrences on or about the companies' properties bring the medical bureau in contact. Strict adherence to the unique *Code of Ethics and Policies** of the Associated Bureaus has brought the maximum of good along these lines.

The medical affairs of the companies are administered in a dignified, fair and honest manner, which is recognized and credited by those who in past years were inclined to criticise. The full measure of what this means may be judged by considering that in every accident involving the traveling public and an electric transportation company there are from one to four or five physicians directly or indirectly concerned. Their influence to secure justice is well worth cultivating, in the opinion of the management, and it is believed that in the district served by the Pittsburgh Railways and its affiliated companies a wonderful asset has been established in this way.

THE COMPANY'S MEDICAL CODE

The *Code of Ethics and Policies*, under which all the bureaus operate, has long since received the stamp of approval by representative men in nearly every field of endeavor. The part covering relations with the medical profession is abstracted as follows:

"The high ethical standard adopted by the members of the medical profession, as well as the relations had by these Associated Bureaus with the large majority of those members, justify the assumption that the relations of the physician to his patient will remain solely professional in all cases resulting from injury in connection with the agents or properties of these companies. It is not expected that, under any circumstances, the physician will confuse his professional relations with the function of an adjuster of claims.

"These Associated Bureaus desire of the physician only that he shall report fully the extent of an injury; that he shall secure to the patient the promptest and most effective recovery possible; and that if he feels justified from his knowledge of the policies and principles which guide these Associated Bureaus, he shall make a suggestion to the patient that these Associated Bureaus do deal fairly and openly, and that the patient's interests will be best served by dealing direct, as in any other business matter, rather than by incurring the unnecessary expense of unavailing aid of others.

"It is held further that the principles and practices of these Associated Bureaus in relation to claims for injury are consistent with the highest business and professional ethics; and that such admonition from the physician to his patient as is bespoken herein cannot be derogatory to the interests of the patient or to those of his physician; but, on the contrary, if sincerely adhered to, must redound to the interest of all concerned.

"It would appear that a physician administering for the results of accidental injury, and particularly when received under the circumstances contemplated herein, may exercise frequently an influence upon the mind of the patient which will tend toward undelayed restoration to normal mental and physical health. Due regard for the high principles of honor and fairness, as well as for the ultimate physical welfare of the patient, is held to assure that there will be accorded the most beneficent mental, surgical or therapeutic treatment available."

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*Described in the ELECTRIC RAILWAY JOURNAL of Oct. 7, 1916, page 712.—EDS.

PHYSICIANS APPRECIATE COMPANY POLICY

The same policy of "absolute fairness, maximum accuracy and persistent courtesy" that pervades all the other bureaus of this organization are applied to the medical problems of the companies. For example, about seven years ago the so-called "company doctors" were abolished, free transportation for many such physicians was done away with, and as far as possible no favoritism was shown in the question of patronage. This immediately raised the companies' standing in the estimation of those medical men who theretofore had considered themselves discriminated against. Within a very short time the railway company was receiving prompt and usually satisfactory reports as to the nature and extent of injury of passengers meeting with accidents. The spirit of co-operation shown by the doctors generally in securing examination appointments for the companies' special examiners was most pleasing and has long since proved the wisdom of the changed policy.

PART OF SURGICAL SECTION OF PITTSBURGH RAILWAYS MEDICAL BUREAU

Reasonable fees are paid to physicians for emergency or first-attention services following an accident, provided a detailed report on forms furnished by the company for that purpose is mailed promptly. If during subsequent weeks the attending physician exhibits his fairness by giving information as to the progress of the injuries, and his bill for subsequent treatment is at all reasonable, his interests at the time of settlement direct with the injured person are protected to the extent of withholding that amount from the settlement. The company concerned then sends the doctor a voucher for the amount of his bill, which often he could not collect otherwise. This courtesy is much appreciated by the medical profession at large within the scope of the companies' patronage.

The medical bureau does not undertake the treatment of injured passengers except in emergency, but keeps in close touch with the attending physician in each case, arranging special examinations as may be warranted by the circumstances. In litigated cases medical defenses are prepared in collaboration with the trial attorneys, but seldom does any of the medical bureau staff appear in court.

These companies employ about 10,000 men. The hazards of their occupation are no less than in similar industrial fields, and in some branches, particularly the lighting and power business, the hazards are greater. The companies have long maintained toward their employees a policy of providing the best surgical, medical or hospital attention for the men hurt while on duty. Consequently the operation of the Pennsylvania workmen's compensation law, dating from Jan. 1, 1916, did not materially alter these medical matters.

In fact, the act itself had been anticipated, so that many months in advance of the Compensation Board's ruling on "reasonable" medical attention, particularly "first-aid" service, and "reasonable" surgical equipment by the employer, these companies were unusually well prepared to take over what added burden the compensation law may have brought about. The equipment of the medical bureau's central surgical section, which is located in commodious, well-lighted and well-ventilated quarters, is second to none in the country serving property of equal size and such varied demands. Part of the surgical section is shown in the accompanying illustration. This section, with the suite of offices connecting the medical bureau, has been most favorably commented upon by officials of other companies, labor union officials and visiting physicians.

ALWAYS LOOKING FOR THE BEST

As illustrative of the companies' generous attitude toward injured employees and the desire to provide the best approved surgical attention, there may be cited the importation and use of "Ambrine"—a paraffine treatment for burns. This substance, which has been popularized by French surgeons in the European war, was secured as soon as its merits had been attested. Its use has left nothing to be desired in the matter of relieving pain from burns and shortening the period of disability.

Of even greater importance to injured workmen is the adoption of the Carrel-Dakin antiseptic solution for the control of severe infections. In this connection the medical bureau expects soon to adapt a modification of this treatment to ambulatory cases. All of the companies' severe injuries are subjected to this method of treatment in a hospital.

CARING FOR TRIVIAL INJURIES

The subject of infections and resulting disabilities, deformities and even death from apparently trivial injuries, while not new, is receiving the closest study, and an earnest effort is being made to minimize this preventable loss of time and needless suffering. Compulsory medical inspection has not been attempted. Rather a personal appeal to the employees, coupled with emphasis on the tragic illustrations of their fellow employees' unfortunate occurrences, and simple first-aid instructions are being tried.

The men are urged to report any accident to themselves or others, no matter how insignificant the injury may seem to them—particularly any break of the skin or an eye injury. The necessity of immediate application of tincture of iodine to the broken skin is impressed upon the men. Where this simple first aid can be relied upon and the injury is not disabling, a suitable protective dressing is used. The injured man's foreman is then held responsible for having the man consult a docfor as quickly as possible within twenty-four hours.

INSTRUCTIVE BOOKLETS FOR EMPLOYEES

About a year ago booklets, setting forth the salient points of the compensation law, were distributed to every employee. These booklets also carried safety suggestions and invitations to the employees to consult the chiefs of the medical or welfare bureaus upon any medical matters or questions arising out of their accidents. There was also in each booklet a folder on which were designated the welfare doctors, their addresses and telephone numbers, and the location and telephone numbers of the hospitals nearest to any particular terminal, power station or large shop.

On these folders are the following instructions for action in case of injury to employees:

First—Send injured employee to medical bureau, surgical section, Room 510, fifth floor, No. 435 Sixth Avenue, if the injury, his appearance and condition would not make the trip objectionable or

Second—Send injured employee to nearest hospital.

Third—Send injured employee to or call nearest welfare doctor.

Fourth—Telephone medical bureau and report only nature and extent of injury sustained and action taken, or for advice if undecided what to do.

Fifth—Make out and forward "Report of Injury to Employee" to welfare bureau, Room 522, fifth floor, 435 Sixth Avenue.

It has been found that observance of the fourth instruction serves to check up the accident reports which otherwise would be delayed or not made. The foremen are told that their responsibility ceases when they report an accident, no matter how trivial. From the receipt of the report the responsibility for following up and making sure that the injured employee receives proper attention is assumed by the welfare bureau.

More detailed explanation of the foregoing instructions are prominently set forth in the booklets, as follows:

If the injured employee is unable by reason of the nature and extent of the injury, appearance or condition, to go to the medical bureau, he should be taken or sent to the nearest hospital or the ambulance of the hospital called. Serious injuries such as broken bones, fractured skull, deep and extensive burns, or severe and extensive lacerations, can best be treated at a hospital. Hospital accommodations are arranged for dressing wounds as well as where the injury is of such nature as to require nursing and confinement.

If for any sufficient reason instructions No. 1 and No. 2 cannot be carried out, the injured employee should be sent to the nearest welfare doctor, first telephoning to make certain the doctor will be in his office. If the injured employee is not in condition to go to the welfare doctor's office, have the doctor come to the injured man.

If the nature of the accident is such as to make instructions No. 1, No. 2 and No. 3 impracticable, or if the emergency is such as to make necessary the calling of a doctor nearer the location of the accident, such action may be taken. In such instance, however, the doctor so called must be specifically informed that his services are requested for the emergency or first attention only and that he will not be expected to render further service unless so instructed by the medical bureau.

These arrangements are considered liberal and will be so interpreted by those in direction of the work. They are not intended to prevent any action in extraordinary cases which would be for the employee's best interests and comfort.

THE WORK OF THE WELFARE BUREAU

In treating injured employees, teaching them the fundamental facts of first aid to the injured and advising them from time to time in health matters, the work of the medical bureau touches in close co-operation with the welfare bureau. The duties of J. L. Roche, chief of the welfare bureau, bring him into the same personal contact with employees that characterizes the surgical attention following accidents, and both forces have unusual opportunities to assist in the constant campaign in behalf of safety and the prevention of accidents.

Mr. Roche personally makes the compensation payments to the men, visiting them at their homes or in the hospitals, or receiving them at his office. Frequently these payments are for more than actual compensation under the law, including, in addition, such welfare payments for entire loss of time, extra expenses and other items as may be properly recommended by the employee's superintendent or general manager. In fatalities the welfare bureau often makes immediate payment of money for the emergency, the formal approval for which is always forthcoming later. The official receipt that is executed for a disbursement shows definitely—as pointed out to the employee—just what amount is paid under legal requirement, how much extra is paid as welfare allowance and at whose request the latter payment is made. This serves to remind the employee that his employing supervisor considers length of service, general merit and loyal conduct, or the reverse if for enforcing discipline no recommendation is made.

BRINGING THE WELFARE BUREAU AND THE INJURED EMPLOYEE TOGETHER

By requiring the injured employee to present himself whenever possible at the offices of the medical bureau, there is a decided saving of time and expense and the maximum of benefit to the employee. The requirements of the Compensation Board as to detailed information regarding accidents and machinery involved therein makes an interview with the chief of the welfare bureau or one of his assistants quite necessary. In no other way can the desired facts be secured satisfactorily. It is manifestly much cheaper to have the injured employee, with his hurts properly attended, step into an adjacent office and furnish the required information about his accident than to later send a representative of the welfare bureau to him for that information. The injured man is thus placed in touch with the bureau, with which he may have prolonged dealings.

In addition to these considerations the employee receives the benefit of the best surgical equipment and attention which specially suits the needs of his case with better results than might otherwise be obtained. It is believed that a greater degree of success in handling accidents to employees and a more reasonable attitude toward the employer can be secured by thus injecting the personal tone into what frequently are economic catastrophies to the breadwinner. So successfully have the foregoing policies worked out that for more than a year's operation of the compensation law not one petition was filed with the compensation referee in the local district, and as far as is known no complaint was made about the medical attention furnished.

Statistics of these companies in accident cases involving their employees show conclusively that the cost of accidents may be materially decreased by systematic central safety organizations, working jointly and coordinately with first-class medical supervision. No longer is there any doubt in this matter, as viewed by the most successful executives of big industries. Hand in hand with this idea is that of the employer having accurate appraisement of the physical condition of his employees, not only at the time of application for employment, but at stated intervals, to the end that the human investment may be conserved for mutual good. Misfits and rejections there always will be, but as the spirit of humanity becomes more established the modern conception of fitting the job to the man will supersede old methods. Experience has shown that the wasteful turnover of labor can be cut down to a small percentage.

Southwestern Association Meets at Dallas

At Its Sessions the Railway Section Discussed Papers on the Subjects of Power Stations, Track, Car, Car Shops, Automobile Competition and Other Present-Day Problems

THE annual convention of the Southwestern Electric & Gas Association, held at Dallas April 26 to 28, was attended by about 300 people. Several entertainments and a Jovian rejuvenation interspersed the business sessions, while the regular papers attracted lively interest and were followed by frequent discussion.

At the opening meeting F. R. Slater, president of the association and general manager Texas Power & Light Company, spoke of the need of efficiency and intelligent thought in utility management, now more important than ever before because of the war crisis and the probability that a portion of the employees would be called away for military service. The education of the public as to its rights and those of the public utility he considered to be of the greatest importance to the association members for, as has been said, all business is based on confidence.

FIRST RAILWAY SESSION

In the afternoon the electric railway section voiced an optimism as to the future and a confidence of the ability of the railway companies to solve the present-day problems. G. H. Clifford, Northern Texas Traction Company, Fort Worth, was chairman of this section. Four papers were read and discussed by a large part of the members attending.

"Betterment of Central Station Management," by C. R. Roberts, betterment engineer Stone & Webster Engineering Corporation, Fort Worth, was the first paper in this session. In response to some questions the speaker said that as a part of this betterment his company had installed a CO_2 recorder on each boiler and that form blanks, showing when boiler cleaning was necessary, were made out and signed by the cleaner and the chief engineer at each scheduled cleaning. An abstract of the paper by Mr. Roberts is published elsewhere in this issue.

"The Maintenance of Way Department To-day" was the title of the next paper. It was read by B. R. Brown, superintendent maintenance of way, Dallas Electric Company, and brought on a discussion of joint welding and track grinding. An abstract was published last week. W. B. Tuttle, vice-president San Antonio Traction Company, said that in its track work the company had found the Goldschmidt thermit insert weld very satisfactory, and the joints are hard to find afterward. There is no trouble with cupping, and most of the later rail breaks come in other portions of the rail. The reciprocating track grinder handles corrugations very effectively, but owing to the cost of this method the San Antonio company is at present trying out a rotating grinder.

The use of the electric welder was recommended by several others on smaller roads, in spite of its first cost, because of the saving it would effect in the end, due to reclamation work and the postponement of reconstruction.

Theodore Taylor, master mechanic Northern Texas Traction Company, then gave "A Few Thoughts on Car Shop Practice." Adding to this, Mr. Brown remarked that all inspection on the Dallas railways was made on a mileage basis, the period being every 500 miles, or about every third day. This eliminated the usual troubles about as soon as they started. The last paper was "The Influence of the Automobile on the Interurban," by James P. Griffin, general passenger agent Texas Electric Railway. Abstracts of both appear on later pages in this issue.

At the close of the afternoon session it was announced that the "King of the Rails" films, showing construction details of the G. E. electric locomotives of the St. Paul Railway were run twice a day during the convention at one of the Dallas theaters. A buffet dance, complimentary to the visiting ladies, the members, and guests, was given by the Suppliers Section of the association in the Palm Garden of the Adolphus Hotel that evening.

SECOND RAILWAY SESSION

The session on Friday morning was opened by a paper by V. W. Berry, general superintendent Northern Texas Traction Company, on "Vital Present-Day Problems of the Street Railway Operator." This paper was printed in abstract last week. In the discussion it was the general opinion that while the use of automobiles in the country often brought passengers to the line, in the city each new machine on the streets was a loss to the company, largely because of the practice of automobile owners to pick up friends and carry them to and from town. Mr. Clifford and Mr. Tuttle estimated the loss in revenue to their companies from a new automobile on the street to be $40 per year and 15 cents per day respectively.

To meet the present-day demand for speed and better service, light cars capable of quick acceleration and deceleration, and traveling on a schedule of more frequent headway were urged. W. A. Sullivan, manager Shreveport (La.) Railway, cited as an example of the effectiveness of this the experience on a certain 7½-mile branch of his company. On this branch in 1915 the company operated nine cars and carried a large volume of traffic. When the jitneys came along it was hard hit. Eventually the company put on thirteen cars and speeded up the schedule and now has a larger business on this line than in 1915.

The telephone dispatching system of the San Antonio Traction Company and the flexibility which it gives the system were explained by G. W. Merritt, chief dispatcher for the company. The motormen report by telephone at the end of each run and the traffic inspectors from downtown line intersections. The whole system is owned and maintained entirely for their use by the Southwestern Telephone Company, at a cost of $135 per month.

BUSINESS SESSION

On Saturday afternoon, after the light and power session, the nominating committee made its report and the association unanimously elected the following officers for the ensuing year:

President, H. C. Morris, general manager Dallas Gas Company; first vice-president, D. A. Hegarty, president Texas Gas & Electric Company, Houston, Tex.; second vice-president, W. A. Sullivan, manager Shreveport (La.) Railway; chairman executive committee, F. R.

Slater, general manager Texas Power & Light Company, Dallas.

Galveston expressed its desire to see the convention return to it next year but the location of the coming meeting was not determined.

The Influence of the Automobile on the Interurban*

The Author Analyzes the Effect of Automobiles Both in Increasing and in Decreasing Traffic

BY JAMES P. GRIFFIN
General Passenger Agent, Texas Electric Railway, Dallas, Tex.

THE automobile is both increasing and decreasing interurban receipts. It is both building up and tearing down, adding to and taking away.

In support of the statement that the automobile is increasing interurban receipts, I offer two propositions. First, the privately owned automobile is bringing people from off-line points to the cities and towns on the interurban for the purpose of using the interurban in completing a trip to some other point, generally at quite a distance. In order to secure any great benefit from such condition it seems to be necessary that the interurban line be of some length. Second, the automobiles operated for hire between country villages and settlements and the larger centers of population on the interurban lines, what we might term "interurban jitneys," are bringing to the interurban many patrons. In our section of the country there are a number of these "interurban jitney" routes, the cars operating on schedules timed to make connection with our cars.

The fact that the automobile is decreasing interurban receipts is easily established. Man is a social being, and seeks the company of his kind. When starting on an automobile trip, it seems that his first thought is for some one to accompany him. Our agents tell me that time and time again automobiles passing their stations stop and call from their waiting rooms people who are there awaiting the coming of an interurban car. This happens not merely in one place, but in many. It is the most common of all reports given by agents. It is more noticeable in the smaller towns, where everyone seems to know everyone else.

This is eating into the short-haul travel of the interurban. The long-haul is not being so much affected, yet on the occasion of the recent visit of ex-President Taft to Dallas I found here people living in Hillsboro, 66 miles distant, who had made the trip by automobile.

We sell round-trip tickets, and receive a number of requests for refund on the unused portions thereof. The most common of all reasons given for not using the ticket is "made the trip in an automobile." During the month of March, 1917, we handled a total of 437 refund claims, 156 being made by people who either made the going or returning trip, or both, by automobile, this being 35 per cent of the total number of all claims. This shows a direct loss of revenue.

Many traveling men representing local wholesale grocery and drug houses, etc., have purchased automobiles, which they are using in making their territory. Formerly these men made a number of their trips via the interurban. Now not only is practically all of their patronage lost to the interurban, but they also carry from town to town people who otherwise might have made the trip via the interurban.

Not only are passenger receipts reduced, but also express receipts. Automobile trucks, specially designed for freighting, are operating out of some of the larger cities, and in direct competition with interurban express. These trucks being heavy, of necessity, require good roads.

In striking the balance, giving credit for the increase, and charging for the decrease, it is readily apparent that the automobile is causing a distinct loss of revenue to the interurban lines.

How long will this condition exist? How much longer will people continue to spend money for gasoline, oil, tires, repairs, etc., to make an automobile trip, which all in all costs more than if the trip were made by interurban? Grant you, of course, that the man in the automobile can start when he wants to, and return when his inclination directs, and has his car available for any running around he may care to do. Still the interurban schedules are fast and convenient. Gasoline is now 22 cents, and going up. Materials are increasing in cost, automobile concerns are raising the prices of their cars, tires cost more, etc. How long will it be before the car owner will sit down and seriously figure the cost to him of the trip in his automobile? When you get him to doing this, then you are beginning to win your battle.

How can this decrease in receipts be offset? As I see it, the interurban man should exert himself more and more to make his service more comfortable and attractive. Exert more efforts to please every patron. Dig into the surrounding territory more and more for increased business. Work to get competing lines to bring passengers to you. Work in the outlying districts to get the people to come to certain points in their cars and continue the trip via interurban from there. These are some of the many ways to increase business, and efforts spent thereon should bear much fruit.

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*Abstract of a paper presented at the thirteenth annual convention of the Southwestern Electrical and Gas Association, at Dallas, Tex., April 26-28, 1917.

Betterment of Power Plant Management*

Coal Analysis to Determine Chemical Content and Inter-Departmental Co-operation Will Effect Considerable Reduction in Operating Cost

BY C. R. ROBERTS
Betterment Engineer Stone & Webster Engineering Corporation, Fort Worth, Tex.

THE power plant requires a generous portion of the total investment in equipment of an electric power company, and its operation consumes a large part of the total running expenses. As the demand for more frequent service and competition in traffic handling has led to improved equipment and improved transportation methods, so has the increased cost of fuel and other materials led to improved equipment and improved operation of the generating station. When one realizes that three-fourths to four-fifths of the total operating expense of the station is expended for fuel, the seriousness of the fuel situation as it to-day confronts the street railway and electric lighting properties is apparent. This part of the operating expense will increase in direct proportion to the increased cost of fuel unless some decided improvement in operating economy is effected.

FUEL SUPPLY

The most common two fuels are coal and oil. The property which is located within economical reach of oil is extremely fortunate, as nature has produced in oil a fuel much less troublesome than coal. The fortunate ones may, however, be informed at any time by the oil companies that distillate can be successfully refined into a product more profitable than fuel. The price of coal in the Southwest and West will then depend upon the generosity of the mine operators and railroads in those sections.

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*Abstract of a paper presented at the thirteenth annual convention of the Southwestern Electrical and Gas Association at Dallas, Tex., April 26-28, 1917.

One of the most important steps to be taken in improving station economy is the proper selection of fuel. Although bituminous coals look as much alike as a team of Kansas mules, there is, without proper handling, a decided difference in pulling power in both cases. In selecting coal the supply and transportation facilities should be investigated to insure a continual supply sufficient for operating requirements and for the accumulation of a surplus for emergency. To insure even quality the coal should be sampled as it comes through the mine tipple in cars. Then the chemical analysis will include an average amount of faults in the vein. The analyses made by the U. S. Geological Survey are not suitable for use in this work as they show only the quality of the pure vein of coal. Consequently the calorific values shown by them are considerably higher than the coal as received at the station would have. The coal to be selected should be the one that shows the greatest calorific value, taking into account its price and the equipment necessary for consuming it. A contract should then be entered into, the essence of which should be a continual supply of fuel at the standard calorific value, the contract price to vary in accordance with the calorific value above or below the specified standard. A very accurate average sample can be obtained by means of any improved type of automatic sampling machine located in the path of the coal entering the station bunkers.

CO-OPERATION IS THE BASIS OF BETTERMENT WORK

To improve operation conditions, it is first necessary to gain the confidence and co-operation of the chief engineer and his operating force. This can only be done by convincing them that the work to be undertaken is not a criticism of their methods or a reflection upon their ability. The greatest and most lasting results that are obtained through betterment work are those prompted by a free and unbiased exchange of ideas. When every operating man learns that he can freely express himself, whether he be coal passer or chief engineer, then the co-operation of all is definitely established and economies are sure to follow. In order to produce lasting results complete betterment work cannot be satisfactorily accomplished in less than six months.

The most important factors in station management are operation, maintenance of equipment and organization. In order to improve the economy in operation, the following work is usually necessary: Training of firemen; training in the economical handling of boiler feed water; scheduling of boiler operation, of boiler cleaning and operation of engine-room equipment; training of engineers; introduction of a proper operating log, and establishing of a proper system of accounting.

IMPROVING OPERATING CONDITIONS IN THE BOILER ROOM

After the proper design of furnace has been determined, the fireman should be trained in the economical combustion of the particular fuel selected. The boiler room should be equipped with instruments which he should be trained to use intelligently as a guide. Some of the most essential are an automatic or manual CO_2 recorder, and thermometers for feed water, steam and stack temperatures. Indicating thermometers and draft gages should be installed where additional operating data are necessary. These instruments should all be observed and readings recorded at least every half hour, and the CO_2 and draft readings should be observed continuously. The individual watches should be kept separately and the results posted in the boiler room for comparison by those on each particular watch. This promotes friendly rivalry between the operators and appeals to the pride of each, which has a tendency to produce even a higher standard of operation.

The firemen should be trained in the economical use of boiler feed water, maintaining at all times a maximum temperature and utilizing a minimum amount of exhaust steam. The manner in which each man handles this feature of operation is clearly shown on the recording thermometer chart connected to the feed-water system. Tests should be run to determine the most efficient load to be carried on boilers.

A boiler-room operating schedule which will call for the proper number of boilers to be operated by any given load should be put into effect. There is always a general tendency to operate boilers in excess of the load requirements. Accumulation of soot on the external sides of tubes should be carefully observed and a schedule for external cleaning put into effect, otherwise 3 to 5 per cent of the fuel may be wasted. If scale is accumulating rapidly on the internal surfaces of tubes a chemical analysis of the feed water should be made and proper treatment prescribed for the water.

THE ENGINE ROOM NEEDS CARE ALSO

In the engine room tests should be run on the main units to determine the most economical load for each. A schedule of unit operation should be put into effect which, when followed, will produce a maximum over-all engine-room efficiency for any given load.

The engineers should be trained and educated in the economic value of following this schedule, and in the economical operation of engine-room auxiliaries, at all times maintaining a maximum vacuum on condensing equipment, while circulating a minimum amount of condensing water. The amount of steam auxiliary equipment to be operated should be just sufficient for heating boiler feed water without waste of steam to atmosphere.

Operating log sheets should be introduced, showing graphically the load carried with a superimposed graph showing the capacity in equipment operated. The readings of all indicating graphic and recording instruments should be included in the operating log and arranged in such manner that a complete analysis of each day's operation can be made.

OTHER IMPORTANT MATTERS

Accounting for material used and material on hand, particularly fuel, is a very important feature in station economy. A complete record of operation should also be kept. A brief synopsis of the most important features should be sent daily to the manager or superintendent, informing him of the economic results of each day's operation. A schedule of systematic maintenance and inspection should also be put into effect and the condition of each piece of apparatus should be fully recorded. The schedule should be so arranged that each piece of apparatus is inspected a certain number of times each year, the frequency of inspection depending upon the class of apparatus. Thus none of the equipment in the station is overlooked, and by the adoption of a schedule of this kind many serious accidents to equipment and men may be avoided, and continual service insured at a minimum expenditure for maintenance.

To maintain and operate a modern power station at high efficiency it is necessary to have an organization of more than average intelligence. It is therefore necessary to do considerable educational work within the organization. To encourage the individuals along educational lines some companies have advised employees to take correspondence school courses, and as soon as a course is complete they are reimbursed for the cost by the company. The plan has produced very satisfactory results. The rapid strides that are being made in power-station equipment and the necessity for its improved operation make it very necessary that the educational standard of the organization be advanced. If this is not done it is useless to expect a maximum result in operating economy.

As a result of following plans such as those outlined, operating costs can be easily reduced from 10 to 20 per cent, the condition of equipment can be improved without additional expense for maintenance and the operating force will be competent to cope successfully with new operating problems that may arise.

Thoughts on Car-Shop Practice*

The Author Outlines Methods and Costs Obtaining in an Efficiently Operated Electric Railway Repair Shop

BY THEODORE TAYLOR
Master Mechanic Northern Texas Traction Company, Fort Worth, Tex.

IN 1910 the cost of maintenance of rolling stock of the company with which the writer is connected was slightly in excess of $17 per thousand car-miles. For the year 1916, the same expense accounts amounted to $8.25 per 1000 car-miles. This reduction was made possible by various causes acting together—it would be unjust for the shop to take the credit for all the saving. To the designers of the equipment and its builders, together with many others, belongs a good share of the economy effected.

Too much emphasis can hardly be placed upon the necessity of regular and systematic inspection of all parts of a car, and more especially is this true of the motive equipment. It is exceedingly good practice to place a car over a pit every four or five days at the least and then give the motor a thorough inspection. The openings in the motor case allow, with the use of a flashlight of generous proportions, pretty thorough examination of the surface of the commutator, the condition of the banding, loose coils, defective connections, inclination of and condition of brushes and other details. A fiber gage can be used to determine whether the bearings are letting the armature down in the slightest, and it is possible practically to eliminate the danger of tearing up an armature in that way. All trolley wheels should be inspected and set straight in the poles and the bases lubricated and adjusted for tension every sixty days. Adjusting the tension between close prescribed limits by means of a spring balance, changing the shape of the groove of the wheel after carefully investigating the subject of wheel wear and consulting with the manufacturers, and faithful inspection have brought our mileage on the interurban division from 1500 to 4500 miles per wheel, and made a corresponding saving on the city lines.

Lubrication costs are capable of amazing reductions. The writer now lubricates an entire system for 17 cents per thousand car-miles, whereas a few years ago 28 cents was the figure. Heavy blue felt of the highest degree of absorbency, immersed ten days or more and thus thoroughly saturated with lubricant, then cut to size and placed in the motor oil cup has proved for years a most dependable method of lubrication.

One of the principal savings made by the writer in some years has been through the purchases of an electric arc welder. Motor cases, gear cases, armature shafts, worn journals, broken brake rigging, the smaller truck parts, practically, in fact, all the lighter forgings and castings about a car can be repaired quickly and economically. For example, in the case of a loose pinion and enlarged keyway, without the welder, it would be necessary probably to renew not alone the shaft, but a full set of coils, mica rings and insulation.

It should be of interest to all operators to learn of the success which can be made with the color-enamel system of painting cars. A car can be put through the paint shop and be out of service less than two weeks and require an expenditure of labor and material of from one-third to one-half of what was necessary under the old paint and varnish system. For the small, single truck car the old method cost approximately $120, while through the use of the imported color enamel, the cost is $45 per car, besides the saving in idle time. The figures for the double truck car are $130 against $55. The job stands up better than in the case of the old system, for the surface retains its luster and remains free from fine cracks. The variety of shades available is, to be sure, limited, but our system is at present using the material on all city car bodies and trimmings, thereby getting much longer life, a better appearing car and saving anywhere from $70 to $80 per car.

As a general proposition it can be asserted that it is poor economy to purchase anything but the best of material. The best grade of waste at 28 cents per pound for lubricating purposes is more economical than a waste that could be used and cost one-half as much. It would seem poor economy, judging from the writer's experience, to purchase anything but a babbitt metal with a tin content of at least 85 per cent. Trolley rope of the highest grade at 50 cents per pound is a better investment than the salesman's "just as good" at 35 cents. Car maintenance and repair material may be bought intelligently and with an eye toward saving, but our experience is that in material which has to stand up under the conditions confronting the ordinary street car, the best is none too good and purchases should be made fundamentally on a quality basis.

There is no department of the average street railway in which ancient practices can take firmer root than in the repair shop. Anything that will bring to the attention of the foreman and the men new methods and the results to be obtained from applied ingenuity will have most excellent results. All the men should, at the very least, have access to the current trade journals, and if it is in any way possible, they should be induced to take out subscriptions of their own, the company assuming a portion of the cost.

An Appeal to Auto Owners

The New York, New Haven & Hartford Railroad in its campaign to prevent accidents at grade crossings has issued posters urging drivers to use extreme caution in crossing railroad tracks. These posters are being displayed in conspicuous places along the New Haven lines. The posters call attention to the fact that more than 2000 persons were killed in 1916 in grade crossing accidents. Also that the number of persons killed and injured by these accidents is increasing at the rate of 25 per cent each year. In the first two months of this year there were ten accidents of this kind on the New Haven road, in which six persons were killed and thirteen injured. The posters are a direct appeal for a greater exercise of care by the automobilists of New England.

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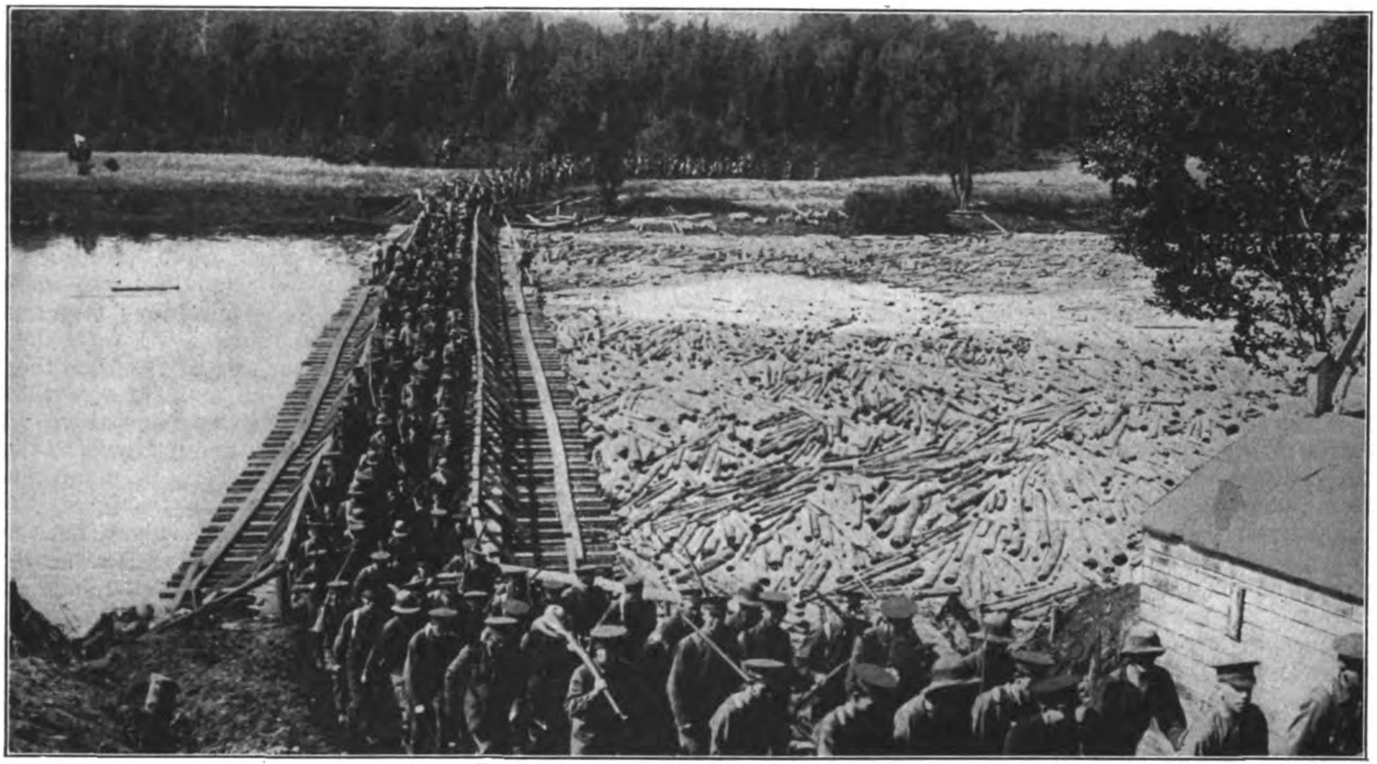
*Abstract of a paper presented at the thirteenth annual convention of the Southwestern Electrical and Gas Association, at Dallas, Tex., April 26-28, 1917.



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Canadian Experiences In War Time

Even with Nearly 6 Per Cent of the Population Under Arms, the Electric Railway Industry of Canada Has Been but Slightly Affected by the War—The Labor Shortage Has Been Marked, but Traffic Frequently Has Been Stimulated

JUDGING from the experiences of Canadian electric railways during the last three years, the entry of the United States into the war will make hardly more than a negligible change in the conditions of electric railway operation in this country, even with the raising of an army of 2,000,000 men. This conclusion is based upon the fact that our ally to the north, with a population somewhat in excess of 8,000,000, has enlisted an army almost 500,000 strong, thus sending to the front nearly 6 per cent of the total number of inhabitants. In the United States, with 100,000,000 people, the proposed army of 2,000,000, which appears to be the generally accepted probable maximum, will result in the engagement of only 2 per cent of the population by the active military establishment. Such a small percentage—one-third of the Canadian figures—can hardly exert an appreciable effect upon our electric railway industry, since the Canadian railways have been influenced only to a minor degree by an economic disturbance three times greater, relatively, than that which is likely to obtain in the United States.

For the average Canadian electric railway the outstanding features of wartime conditions have been a marked increase in wages and cost of material over 1914 and a considerable change in personnel, mainly because of enlistments. Aside from these items the alteration in general conditions surrounding electric railway operation have been almost insignificant in character. In fact, the majority of reports state quite definitely that conditions have not been materially altered, the increased cost of operation being frequently offset in large part by an increase in traffic.

There have been heavy withdrawals of electric railway employees from service, due almost altogether to enlistment in the army. The loss from this cause, which varies from 10 per cent to 30 per cent has, apparently, been characteristic of every railway company, but the extent of the loss seems to be dependent upon no particular set of circumstances. Since only the volunteer system of recruiting has been in force in Canada, no class of labor has been exempted, and the electric railway industry has been drawn upon just the same as the other industries of the country. However, it is reported that the National Service Board, which recently has tabulated the man-power of the Dominion of Canada, does not propose making use of electric railway employees in any other than the positions they now hold, in case extensive redistributions of labor are attempted.

WITHDRAWALS OF EMPLOYEES

Platform men, because of the large number employed, constitute the major part of the withdrawals. All departments, however, are represented, and it is said that, since there are so many branches to the modern military organization, it is almost impossible to find a man in Canada to-day who cannot be used by the government in some capacity or other. Transportation is a very prominent feature of warfare, and good transportation men, as well as railroad engineers, both civil and mechanical, are in great demand. The demand applies even to ordinary railroad laborers. In some cases engineering and operating officials are considered to be of greater assistance to the cause if they remain in their civil positions owing to the fact that the roads employing them may be furnishing service that is vital to communities given over to the manufacture of munitions.

Only a comparatively small percentage of electric railway employees have left the service for the purpose of taking up munitions work, but withdrawals have generally been heavy among employees having mechanical training. In the Western provinces farm labor has drawn an appreciable number of electric railway employees out of service, and one Western railway, which reports the loss due to enlistment at 30 per cent, gives the loss to the farms as 35 per cent, and withdrawals for various positions carrying greater remuneration (owing to the scarcity of labor) as 20 per cent.

At present there seems to be a tendency toward eliminating young men altogether from the personnel of electric railways in Canada. One company reports that all young men either have enlisted or else have been let out of the service, and their places have been filled by men who are not eligible for military duty.

In general, the opinion seems to be that about the same or a slightly smaller proportion of men have left the electric railway industry, either for enlistment or for munitions work, than has been the case in other industries. In one locality the loss of the electric railways was between 15 per cent and 20 per cent, while from the coal-mining industry in the same district the loss was 24 per cent. In only a few cases is the loss from enlistment believed to be greater in the electric railway field than in other industries.

MAINTENANCE OF PERSONNEL

Filling the places of the employees that have left electric railway service for various reasons connected with the war has been the most prominent problem faced by the industry in Canada, yet on the whole the consensus of opinion seems to be that the maintenance of the personnel has not really been difficult. The quality of labor for replacement, however, has been inferior, and in certain instances this has resulted in the introduction of one-man cars and even in the employment of women.

For patriotic reasons a number of electric railways have made special rules in regard to the selection of men for replacing withdrawals. One company states that no single men eligible for military duty have been employed since the war began, and for some time past preference has been given to applicants in the following order: Returned soldiers, soldiers who have enlisted and have been rejected before proceeding to the front, men who have applied for enlistment and have been rejected, and, finally, to married men who have not enlisted. In this particular case, however, the local scarcity of men does not appear to be so severe as it is throughout the Dominion in general.

A wholly different situation is evidenced by the following quotation from the manager of another company: "Operating, as we do, in a large industrial center, our labor situation has been acute for some time. To date we have been able to find men for the vacancies caused by employees enlisting, but in the more recent months the quality of labor that we have obtained has been inferior to that which was on our payroll prior to the war. We are looking forward to the necessity of employing women conductors in the near future, provided we find it unwise to attempt operating one-man cars. We believe this latter type of car to be one of the solutions of our labor situation, and the present time is most opportune to inaugurate their use. We have found it increasingly necessary to introduce labor-saving machinery and methods, not only from the standpoint of obtaining the greatest output from our present employees in maintaining the service that we gave prior to the war, but also to enable us to undertake the additional work necessitated by our increased business."

The general opinion, or average situation, is perhaps best outlined by an official of a city railway of moderate size as follows: "We have experienced no difficulty in maintaining our forces, although most of the men that we originally employed were young and many of these have enlisted, so that we have had to fill their places with older men who are perhaps not so reliable nor so well trained. We replace these men as far as possible with returned soldiers who have been unable to continue at the front either from wounds or other causes. We have had no difficulty in keeping together our force of shopmen. This has been a question of wages only, and as long as we could keep our shop employees' pay up to that of the munitions factories the men have been content to remain. In fact, they have remained with us at a lower rate of pay than they could have obtained by working on munitions as they have realized that their employment here is steady. In addition, they are used to our work and prefer it to the more erratic and laborious employment in munitions plants."

From the foregoing paragraphs it is evident that the problem of maintaining the personnel varies greatly according to the locality, and although the majority of roads seem to find the problem of replacement of employees not an insurmountable one, there are others that find it exceedingly acute. In the latter case the need for labor-saving devices is more definite, and in the smaller cities the idea of one-man car operation has become popular. There is, of course, nothing to prevent the working out of this system to the satisfaction of everyone concerned and to the betterment of the rising cost of operation, which is very greatly increased.

WOMEN CONDUCTORS TRIED OUT

Owing to the experience with women conductors in England the use of women in Canada has received considerable thought, but apparently the plan has been actually tried out in only one instance. The following quotation gives an outline of the results in this case: "A result of the scarcity of available labor that was very strongly felt in this district came through employees taking advantage of the opportunity to agitate for higher wages. Because of the urgent call for volunteers and for farm help, we resorted to the expedient of employing women, and this has had several far-reaching effects. First, the unions, or the employees in general, recognized that the supply of women was a large one.

"With the women paid the same wages as the men the work was attractive to women, and the shortage of labor in this manner was made up. This stopped agitation on the part of the men. In the second place, the women took hold of their work in a surprising way, going through their training period more quickly than the average man. Thus far the women appear to be more exact and more conscientious in their work, and they are able to do everything the men did, with the exception of climbing upon the tops of the cars. To date we have used them only as conductors, and I would say that they have been a marked success. We have recently contemplated using women as oilers or in similar positions in the power house.

"After our experience here in a small way with wartime conditions, I feel that other and larger roads might seriously go into this question of replacing male employees with women wherever possible. A great number of difficulties would then disappear through the freeing of men for active military service, or for work upon munitions or on the farms, and in doing this a new source of labor supply is opened up with which to temper conditions and to prevent undue labor shortage, which always brings in its wake unrest, agitation and labor troubles. Our practice is to employ women of thirty years of age or over, war widows, or women whose husbands are at the front."

INCREASED WAGES

Naturally the shortage of labor that has existed in Canada through the withdrawal from productive employment of 500,000 soldiers, together with the still greater number of munitions workers who supply their needs, has brought about large wage increases since 1914, with the possibility of still higher rates in future. In one case, which is thoroughly typical of average conditions it is stated that platform men, carhouse men and practically all mechanics were receiving 27¾ cents per hour when the war broke out in August, 1914. This rate was increased to 30 cents per hour on Oct. 1, 1916, and was again increased to 33 1/3 cents per hour on Jan. 1, 1917, thus making an increase of 20 per cent since the outbreak of the war. The wages of those in other capacities on this property and those who are in charge of the operation have been increased from 7½ per cent to 10 per cent.

Accompanying the increased wages, the cost of living for employees has also risen rapidly so that, in many cases, workmen are probably no better off, if as well off, as they were before the war. This condition, as well as the shortage of men, has had a very definite effect upon labor unrest, and although labor troubles have not increased, it may be that they are rather held in abeyance than made definitely less. One report states that labor troubles have "increased, but not to the breaking point," as the government of the country during the war and the sentiment of the people in addition have a restraining influence upon the labor unions.

TRAFFIC, OPERATION AND MAINTENANCE

In general, the business condition of Canada has been one of great prosperity subsequent to the first months of the war, this being due to the immense amount of money spent by the government for supplies and for the labor engaged in the munitions factories. Particularly in the steel-making and manufacturing districts the general business prosperity has had a very favorable effect upon traffic, but the increased business of the electric railways has not generally kept pace with the increase in operating and maintenance costs. A majority of the companies consider that, in the final analysis, the net results from operation for electric railways have not been altered materially since 1914, even though traffic has very generally increased.

In some instances, of course, especially in the smaller cities, traffic has fallen off. This has been ascribed to the withdrawal of so many men from all classes of business, especially the mercantile trade, without the stimulus that munitions plants have brought to manufacturing districts. Consequently, in the small towns there are not so many people to ride, and in addition the high cost of living keeps many people from spending their money for car fare. On interurban roads the passenger traffic seems generally to have increased because of the establishment of recruiting stations in the larger towns and cities and the consequent stimulation of travel between these points and the country districts.

A very considerable amount of traveling appears to be done by soldiers off duty, and this has an appreciable effect upon the traffic returns. There is no standard practice in regard to free or reduced transportation for such travel. The majority of roads make no arrangement for reduced fares or free riding for individual soldiers, and the prevailing attitude on the question seems to be fairly well summed up by the following quotation: "All other lines of business are being paid exceptionally high prices for their output, and we do not believe that electric railways should be expected to carry free, or even to make reduced rates, for such transportation in view of the small margin, if any, that exists between income and operating costs."

Reduced fares for soldiers in uniform have resulted in one case in the sale of ten tickets for 25 cents in place of the regular ticket rate of six tickets for 25 cents, and in another case special tickets at 2½ cents each. One interesting result of the issuance of free transportation to soldiers in uniform appears in the 1916 figures for a city system, which show that no less than 6 per cent of the road's total traffic was given gratis to soldiers!

Another phase of electric railway operation that has been materially affected by the war appears in the great increase in the cost of materials for maintenance. The cost of maintaining railway property and equipment has increased in some cases by nearly 50 per cent, and the cost increase has been especially marked in the case of material that is brought in from the United States. Freight shipments of materials also are most uncertain because of the congestion of the railroads through the movement of troops and war munitions, and to overcome this many shipments which otherwise would come by freight have been routed by express in order that the material would be on hand when needed. Aside from this, deliveries on materials are, in general, much delayed and the standards of quality have, in many cases, been greatly reduced.

THE WAR AND CANADIAN ELECTRIC RAILWAYS

Canada, with a population of 8,000,000, has raised an army of 500,000 men—practically 6 per cent of her population.

Enlistments from Canadian electric railways averaged 20 per cent of the total number of employees. This is approximately the same percentage that applied to other industries.

Relatively few employees have left electric railway service to work in munitions factories, but withdrawals to the farms have been marked in the western provinces.

A labor shortage has been increasingly evident, but replacement of withdrawals has not been really difficult up to the present. One-man cars and women conductors have been introduced in some instances.

Wages have generally increased since 1914, paralleling the experience of the United States. The prices of materials have been greatly augmented.

Traffic has frequently increased, but the net results from operation of most electric railways have not been altered materially since 1914.

MISCELLANEOUS WAR-TIME ACTIVITIES

Practically all of the Canadian electric railways have made special efforts to stimulate enlistments not only among their own employees, but also on the part of the public in general, through the display of posters and other forms of advertising on the cars. This is, of course, a natural development from the adoption of the volunteer system. Payment of wages to employees who

have gone to the front appears to be exceedingly unusual, but the younger men have been almost invariably encouraged to enlist. The following quotation covers a typical case of the attitude of a railway company toward its enlisted employees: "All of the men who enlist will be given their positions when they return in the same place on the seniority list as when they left. Our standard agreement calls for employees to indemnify the company for the cost of their uniforms if they leave within a certain time after employment by our company, but we have waived this for men who have enlisted. The street car advertising company has, at times, placed cards in our cars for recruiting purposes, and we have accommodated different battalions and batteries by placing recruiting banners on the sides of the cars and recruiting signs on the fenders."

An interesting comment in this connection appears in the statement of the manager of a representative Canadian interurban railway: "I might say, in conclusion, that the volunteer system of recruiting has reached its limit in Canada, and if the war is to continue much longer, we look for conscription here. We would like to see the recommendation of your President prevail in regard to this matter."

Many of the electric railway companies, in common with other Canadian industries, have contributed liberally to patriotic and Red Cross funds for the benefit of wounded and returned soldiers. Also, as has been previously mentioned, a consistent endeavor is made to provide men that have returned from the front with suitable positions. In this the electric railway companies have done their share in the work of absorbing these men into the ordinary activities of civil life with a minimum of confusion.

Some munitions have been manufactured on a relatively small scale in electric railway repair shops that are large enough to permit portions of the buildings to be turned into plants for this purpose. None of the average-size electric railways, however, is sufficiently well equipped with shop facilities to permit such work, although it appears to be conceded that by doing such work the electric railways could be of considerable service to the government.

The more important interurban railways have been used from time to time by the government for the movement of troops. For this service the government pays 2 cents per mile per soldier. The city railway systems, however, have apparently been used not at all for the transportation of troops or munitions.

Creating Passenger Traffic

Chicago, North Shore & Milwaukee Railroad Is Actively at Work Originating New Travel by Means of Special Trips and Electric Line Tours

VERY recently the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., carried 1179 school teachers over its lines to the Great Lakes Naval Training School, located about 25 miles north of Chicago, where the officers in charge had arranged for their entertainment with drills, boxing bouts, athletic events, sham battle, landing expedition, etc. The interesting thing about this from a traffic point of view is that the excursion was worked up in about two weeks' time, that only $30 in advertising literature was spent, and that the teachers came from as far as 250 miles in all directions around the training station. There were fifteen car loads from Chicago alone and several car loads from Milwaukee, Racine and Kenosha, Wis. A six-car special train was run over the elevated structure in Chicago to **the Sixty-third Street and Stony Island Avenue terminus to accommodate the teachers from Michigan City, Hammond, Gary, Whiting and other cities south of Chicago. Eight cars were started at the Water Street stub terminal in the central business district of Chicago and one car was run through from Oak Park over the elevated and north. As the result of talks in Kenosha and Racine by F. W. Shappert, traffic and industrial agent for the North Shore Line, who is singularly responsible for the success of the trip, the commercial clubs and a few local concerns provided funds to send the teachers from their cities, and one car was chartered for the former and two for the latter city. In addition to the success of the immediate trip, other traffic is anticipated as a result of this excursion, since several of the principals told Mr. Shappert they would be glad to charter cars to take their schools to see the training station.**

This is only one of many plans Mr. Shappert has in course of preparation to create new passenger travel over the North Shore Lines. A few weeks ago he secured a contract from the government to transport nearly 800 troops and their equipment from Fort Sheridan to Milwaukee, and has since been receiving considerable of the recruit movement to Fort Sheridan and the Great Lakes Naval Training School. Now, plans are being developed to offer to the public a number of attractive summer tours by way of electric lines and arrangements have already been completed with the Pere Marquette boat line across Lake Michigan from Milwaukee through F. C. Reynolds, vice-president and traffic manager, for through fares and advantageous connections to summer resort points in Michigan. Negotiations with other boat lines are also under way. Better time and a cheaper rate can be made from Chicago to Michigan resorts by way of the electric line to Milwaukee and across the lake to Ludington than by the steam lines around the foot of the lake. The Pere Marquette has assigned twelve staterooms a day to the North Shore Lines so that through accommodations may be assured. Co-operation with the hotels in Wisconsin and Michigan and general distribution of North Shore time tables and printing of the latter in the Pere Marquette steamer folders are expected to encourage new traffic.

The circle tours under consideration include the trip to Milwaukee over the electric line and across the lakes and back by way of Michigan, Ohio and Indiana electric railways. Special excursions from Wisconsin points to Starved Rock, Ill., and the Sand Dunes on the south shore of Lake Michigan, etc., are also planned.

Mr. Shappert is going into these detail arrangements very thoroughly with the view of being able to guarantee to the patrons of the electric line all accommodations promised throughout their trips. The possibilities for increasing the passenger traffic by these special trips and interchange with other lines have not been touched, according to him. With his former steam railroad experience to guide him, he says that the principal thing the matter with the electric railways is that they do not work together to use each other enough. The only discouraging thing about such a trip as the school teachers took is that the distance of travel is comparatively short and the revenue resulting amounts to only hundreds of dollars while thousands of dollars are almost as easily gained on a steam line through the longer haul possible. But the possibilities per mile of track are no greater and with co-operation as the keynote of his activities, Mr. Shappert is going ahead to solicit interchange with other electric lines in no small measure to produce a greatly increased electric line passenger traffic.

Preparations for Shortage of Food and Labor

Many Electric Railways Have Encouraged Practical Patriotism by Offering for Cultivation Their Rights-of-Way, as Well as Other Land That They Own—Employment of Women in Various Capacities Is Under Consideration by Many Railways

MARKED activity on the part of electric railways has been in evidence during the past week in response to the recent appeal of Herbert C. Hoover, who was until recently chairman of the Belgian Relief Commission and is now head of the American Food Board. "The total stock of food available to-day in the allied world," said Mr. Hoover, "is simply not sufficient to last until next September if America continues her present rate of consumption. The only hope of supplying the deficiency is by elimination of waste and by actual, rigorous self-sacrifice on the part of the American people. We must also plant everything and plant it everywhere it will grow, or next year the food problem will be absolutely unsolvable, and the world will face absolute starvation."

KANSAS INTERURBANS ENCOURAGE TRUCK GARDENS

The alarming situation thus outlined has met with a prompt response by many interurban railways of the Middle West. The Arkansas Valley Interurban Railway, which runs through a typical agricultural district, is planning to get much of the 52 miles of right-of-way between Hutchinson, Kan., and Wichita, Kan., planted in alfalfa. This will probably be raised and harvested by farmers who own abutting land. The company may plant part of the right-of-way itself, using construction gangs, which will thus be kept in employment after the completion of the present stress of work in ballasting the line. It is believed that such work will keep construction gangs intact, since many of the men are former farmers. Two of this company's substation agents, who live in quarters above the substations, are cultivating about 5 acres apiece of the right-of-way, their wives assisting in the gardens.

The Strang Line, between Kansas City and Olathe, is allowing employees to use the right-of-way for gardening, and a total of about 5 miles at various points along the line is under cultivation this spring. In several instances section men have gone into partnership to cultivate such tracts. In two cases persons not employed have been given the privilege of using the right-of-way for gardens. The company has provided implements for plowing the land for its employees.

The Missouri Short Line, between Excelsior Springs and Kansas City and St. Joseph, is permitting employees and farmers to use the right-of-way for crops. The management, while regretting the destruction of sod upon its right-of-way, believes that the use of this land will attract attention to the necessity for intensive cultivation of adjoining ground.

The Bonner Springs Lines has made contracts with owners of adjoining lands, whereby they use the right-of-way for crops at a nominal rental. The crops are chiefly forage, and stipulation is made that no growths shall be high enough to obstruct the view from trains. Much of the right-of-way is now planted in alfalfa and clover under such contracts.

Wherever outsiders are allowed to use rights-of-way the arrangements are made from year to year. Managers believe that the desire this year to get good crops will result in effective efforts by the users in keeping the weeds down.

Not all of the interurban operators in the Kansas City district favor turning over their rights-of-way for cultivation. "We have spent seven years getting a stand of sod along our right-of-way, and we don't want to sacrifice this grass while 26,000 acres of land within a mile of the right-of-way is lying idle," said one manager. "People would come miles to use a corporation's land if it was given free, passing right by other land that is better adapted to cultivation and more convenient to cultivate.

"In the cities, and especially in the suburbs, there are hundreds of thousands of acres that are not used at all, or yield only a scant pasture. Such land is usually being held for speculation. In numerous cases farmers or city men own pasture lands that supported a few years ago five or ten times as many cattle as are kept on it now. Cattle are scarce and high and excess grass is not harvested. Additions of hundreds of acres yield only weeds.

"Farther from the large cities the interurbans encounter a different situation. The farms hug the town limits closely and all the ground is usually well cultivated. The smaller towns also are largely relieved of the danger that confronts the large-city interurban in letting down the bars to trespassers."

TRUCK GARDENING ON OTHER ELECTRIC RAILWAYS

A feature of the plan of the Northwestern Ohio Railway & Power Company to encourage employees in raising their own garden products on the company's unoccupied land is an arrangement that has been made with a canning company whereby all vegetables thus grown will be purchased at the market prices.

More than 300 employees have taken advantage of the Brooklyn Rapid Transit Company's offer of its vacant land for cultivation. Nearly half of this number is made up of men in the mechanical department. In some of the locations planting has already begun, and in nearly all the preliminary clearing work is under way. In a recent notice to employees Colonel Williams, president of the company, stated that the trucking department had on hand a considerable amount of fertilizer which could be used, and that instructions had been given to convey this to the land that had been allotted free of expense to the employees.

On the Reading Transit & Light Company's property the plan has been followed of carrying out farm work by a co-operative arrangement between the employees. The company has turned over 40 acres of land to its men and this has been laid out in lots of 80 ft. x 100 ft. A committee of employees experienced in farm work is supervising the operation. The company has plowed and harrowed the land and is furnishing all the seed that is necessary.

A competition has been inaugurated among employees of the Indianapolis & Louisville Traction Company, whose land is being offered free of cost to employees for use for gardens. Prizes will be given for the best results. John E. Greeley, general manager of the company, has sent letters to all employees urging them to enlist in the "more-food" movement. In part the letter states: "The company owns many small tracts of ground along its line which will be offered without charge to any employee, and in connection with this the following prizes will be offered by the company: First, $20 in gold to the employee producing the best bushel of potatoes on ground owned by the company; second, $15 in gold for the best bushel of potatoes produced by an employee on any ground; and, third, $10 in gold to the employee having the best truck garden containing, among other things, any three of the following: tomatoes, beans, peas, beets and onions. The garden must be on ground owned by the company and not less than 50 ft. square." No two prizes will be given to one person, and in order to compete for the prizes an employee must hand in a contest entrance blank by May 15.

A feature of general interest in this movement has been the recent action of the Merchants' Association of New York. This organization is urging by circular that all employers should make an effort to transfer men from factories to farms during part of the summer in order to relieve the scarcity of farm labor that may be expected at that time. The plan is to contribute the time of any employees who are willing to undertake the work by giving them vacations under part or full pay for two or four weeks. Part of the men's pay will, of course, be covered by the wage of $1 per day that the average farmer may be expected to pay for help during the crop season, and it is pointed out that the employers may expect to benefit indirectly since short crops and excessive food prices will tend greatly to increase factory labor costs, while an abundant food supply will aid in keeping factory wages at a normal level.

Employment of Women Being Considered

A number of electric railways have taken actively under consideration the matter of employing women for services where the physical labor is light. None has yet been employed in connection with the present shortage of labor on electric railways, but the use of women to release male employees has begun already on several steam railroads, notably the Pennsylvania, on which line an elaborate investigation is under way, while at the same time a number of clerical positions have been opened for the first time to women. On the Delaware, Lackawanna & Western Railroad, also, the beginning of a substitution of women for men ticket agents has taken place.

The plans of the Interborough Rapid Transit Company, which is now conducting an investigation on the subject, provide for the employment of women only as fast as men are drafted into military service. On the Boston Elevated Railway, according to a statement made by H. B. Potter before the Massachusetts Public Service Commission, the probable emergency created by the enlistment of employees will be met, if necessary, by the employment of women as conductors. It is expected that 1500 employees of this company will be drafted under the conscription act. Mr. Potter stated that the company had made an effort in Washington to have its motormen exempted from conscription, but that this had failed.

Women probably will replace men as conductors on Kansas City cars when the first million men shall have been called to the colors. An investigation is at present under way by the Kansas City Railways Company with a view to being in a position to make such changes as may be necessary for the adaptation of the company's service to the exigencies of the anticipated conditions.

Notes on War-Time Conditions

The United Railways of Baltimore has made every effort to encourage patriotism on the part of its employees, and as a result no less than ninety-nine of the men in the company's service are under arms. The men have been drawn from every department and have joined the colors in practically every arm. The National Guard infantry regiments have naturally attracted most men, but the company is represented also in the Naval Reserves, the Coast Artillery, the United States Aviation Corps, the Navy, the Marine Corps, the Cavalry and the Reserves.

On March 28 the company's executive committee adopted a resolution, which later was ratified by the stockholders, to the effect that every man now in the employ of the company who enters the service of the army or navy of the United States, either as a volunteer or under call, will be paid his full wages during his active service with the government, less his government pay, and will be given employment by the company on his return.

The firm of Stone & Webster, Boston, Mass., recently addressed the members of its organization in regard to the action that the personnel should take in the present national emergency. It is considered that a uniform decision on the question is impossible because of personal conditions and duties vary with each individual. Attention is called to the fact that the company's organization offers two opportunities for service: First, in the operation of the company's public utilities, which must be continued to permit the various communities to carry on their work, and, second, in connection with the very considerable amount of engineering and construction work which must be performed by the government with more than ordinary rapidity. The company has submitted a letter to the government offering the services of the company's organization for engineering and construction work at cost.

A plan for facilitating small subscriptions to the government war loan has been presented to 1000 Chicago firms by H. M. Byllesby & Company. This organization offers the facilities of its bond department without charge, and also offers to supply subscription blank cards, without advertising matter, suitable for inclosing in pay envelopes to employees, who thus may have the war loan called to their attention. Advertisements are being published by all of the public utility properties under the company's management urging popular subscription to the war loan and offering such subscriptions without charge. These properties serve communities with nearly 2,000,000 population in the West and South.

A most comprehensive scheme of protection for the property of the Brooklyn Rapid Transit Company has been organized under Capt. A. R. Piper, United States Army, who is general freight agent of the company. The principal features of this plan include the establishment of city policemen outside of power houses and substations and the use of watchmen inside of these buildings and at all vital points during twenty-four hours of the day. Searchlight towers have been provided at power houses in such positions that the entire yard and buildings may be covered. The yards also have been cut off by wire fences, and windows near the street and monitors on roofs where overlooked by adjoining buildings have been screened with heavy wires. Rules for visitors have been made particularly stringent, admission being granted only to those personally known to the men in charge. The entire list of employees has been carefully investigated and records of aliens searched. When any question as to the integrity of any employee has arisen the matter has been referred to the local police department for investigation. The police department has been asked also to pay particular attention to conduit manholes and to strategic points where extensive damage might be caused. It is considered, however, that this danger is diminishing.

In regard to the question of exempting electric railway employees from military service, Captain Piper states that he considers this unnecessary, and that it is advisable not to make any exception of electric railway employees, although it would, of course, be impossible to say to what extent the companies were going to be affected by the conscription law until definite age limits had been decided on by Congress.

Physical protection for company's property has been provided on the Toledo Railways & Light Company by a military company formed among the cadet engineers. This squad is being drilled by an army officer and will be used temporarily to guard the company's property; it includes the company's baseball team, and an endeavor will be made to have the men go to the front in the same organization if this is feasible.

WAR CONDITIONS IN LIVERPOOL

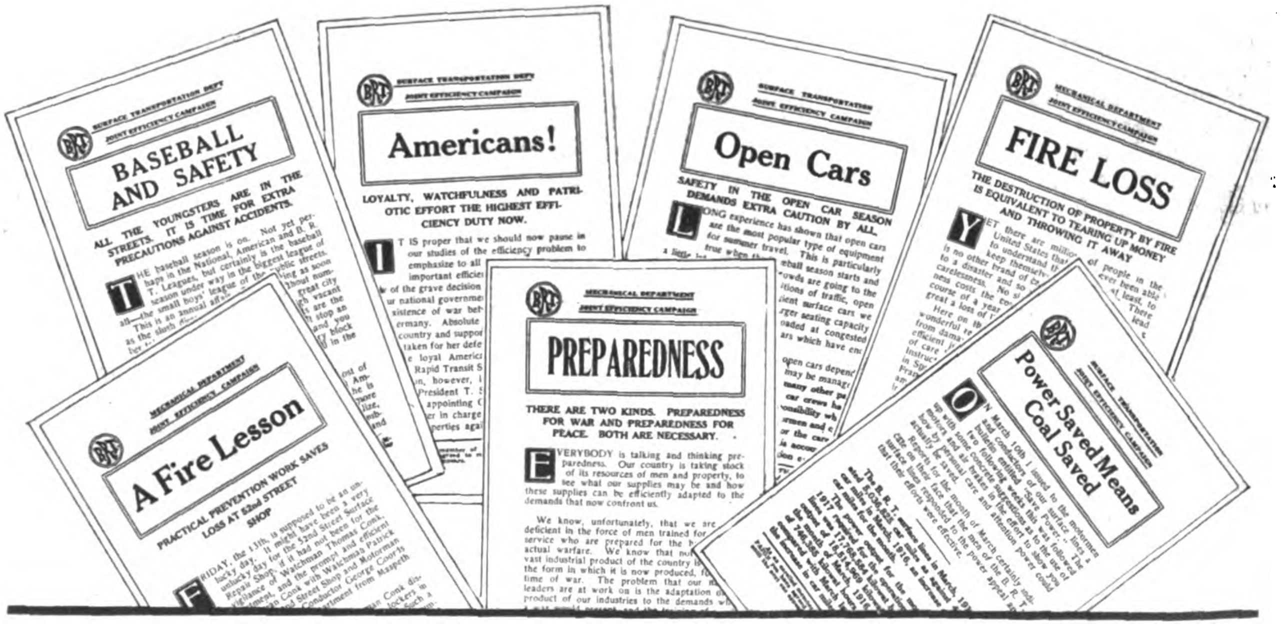
The annual report of C. W. Mallins, general manager Liverpool Corporation Tramways, for the calendar year of 1916 gives several interesting facts in regard to the conditions on that system brought about by the war. In the first place, Mr. Mallins reports that the increase in traffic experienced on other British tramways has taken place also in Liverpool. The number of passengers carried in that city in 1916 was 157,636,595, as against 150,755,680 in 1915, and the car mileage 12,688,163 as against 12,682,018 in 1915. Last year was the record for traffic on the Liverpool tramways, and operations were carried out under very strenuous conditions, owing partly to the difficulty of obtaining supplies and partly to the depletion of the staff, as out of 2700 men no fewer than 1900 joined the forces. Of this number 100 have fallen at the front. The vacancies created by employees joining the colors were filled, as far as possible, by men incapable of military service or by women. This latter class of labor, the general manager adds, has performed its duties as well as could have been expected under the circumstances, and the majority of the traveling public has shown admirable toleration of the conditions. The present staff consists of 1311 male and 1405 female employees.

Safety Medals Presented

The American Museum of Safety last week informally presented the several safety medals which are usually presented at the formal annual meeting. This year on account of the war conditions the usual meeting was omitted and in its place an informal luncheon was held, attended by representatives of the recipients and of the museum. Details regarding the award of these medals have been given in earlier issues of the ELECTRIC RAILWAY JOURNAL.

The Board of Public Utilities of Los Angeles, Cal., has compiled data showing that it would take 11,480 Ford touring car jitney buses to handle the rush-hour traffic handled by 700 cars of the Los Angeles street railways.

Recent Bulletins in the B. R. T. Joint Efficiency Campaign



BASEBALL AND SAFETY

ALL THE YOUNGSTERS ARE IN THE STREETS. IT IS TIME FOR EXTRA PRECAUTIONS AGAINST ACCIDENTS.

Americans!

LOYALTY, WATCHFULNESS AND PATRIOTIC EFFORT THE HIGHEST EFFICIENCY DUTY NOW.

Open Cars

SAFETY IN THE OPEN CAR SEASON DEMANDS EXTRA CAUTION BY ALL.

FIRE LOSS

THE DESTRUCTION OF PROPERTY BY FIRE IS EQUIVALENT TO TEARING UP MONEY AND THROWING IT AWAY

A Fire Lesson

PRACTICAL PREVENTION WORK SAVES LOSS AT 52nd STREET SHOP

PREPAREDNESS

THERE ARE TWO KINDS. PREPAREDNESS FOR WAR AND PREPAREDNESS FOR PEACE. BOTH ARE NECESSARY.

Power Saved Means Coal Saved

The efficiency campaign which has been under way for several months on the Brooklyn Rapid Transit System is acting to co-ordinate the interest and activities of the men of all departments. As stated in an article in the issue of the ELECTRIC RAILWAY JOURNAL for March 24, nearly 95 per cent of the motormen and conductors are enrolled in the campaign and are reading the bulletins systematically. The reproductions above are from the title pages of some of the latest bulletins.

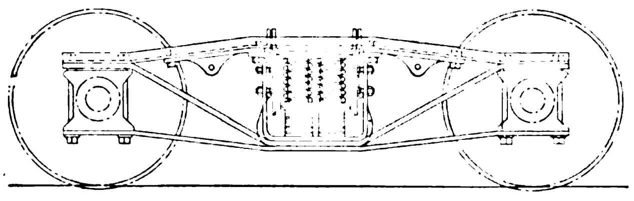
COMMUNICATIONS

Equalizer Bars Not Necessary

L. B. Stillwell, Consulting Engineers
New York, April 27, 1917.

To the Editors:

I was very much interested in the article on truck equalization, in your issue of April 21, by S. A. Bullock, and though agreeing with him on the necessity of distributing the center plate load equally on all four wheels of the truck, I take the position of disagreeing with him in his conclusions as to the best method of securing the desired result. All will agree that it is obviously impossible for the four wheels of a truck always to remain in the same horizontal plane. The inevitable inequalities of the roadbed and other factors cause constant changes of the relative elevation of the wheels. Consequently, to permit of this relative movement of the wheels and axles sufficient flexibility of the truck as a whole must be provided.



TRUCK EQUALIZATION—FIG. 1—PLAIN ARCH-BAR TRUCK WITHOUT SPRING LINKS, USED FOR LOW-SPEED CITY SERVICE

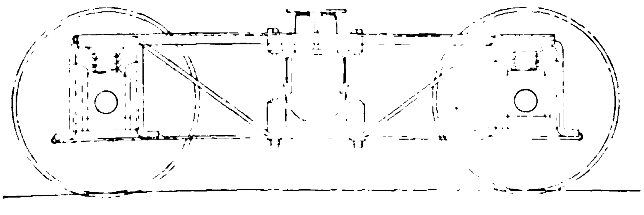
The successful operation of the large number of trucks of the plain arch-bar type shown in Fig. 1 of Mr. Bullock's paper is ample evidence that sufficient flexibility for the purpose of equalization is provided therein. The same may be said of all of the other types illustrated.

The type of truck with equalizer bars shown in Fig. 4, which is advocated by Mr. Bullock, commands respect due to its age rather than to its specific characteristics and operating record. With this design the incorporation of unnecessary weight in trucks is manifestly uneconomical—just as is the incorporation of unnecessary weight in steel cars.

Mr. Bullock's stated objections to the type of truck illustrated in Fig. 3, which has springs directly over the journal boxes, are answered by the operating record of this design. Such trucks are giving very satisfactory service under severe operating conditions as well as under cars where clearances are extremely limited.

Also, Mr. Bullock's statement that efficient equalization requires a spring base less than the wheelbase was apparently made without consideration of the tilting of truck frame which follows brake applications. The smoothness of stop accomplished from high speeds in the case of cars fitted with trucks having springs directly over the journal boxes is a feature worthy of consideration.

F. M. Brinckerhoff.



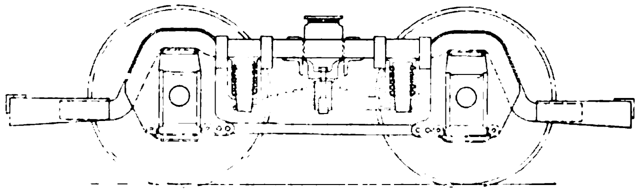
TRUCK EQUALIZATION—FIG. 3—HIGH-SPEED DESIGN HAVING SPRINGS OVER BOXES INSTEAD OF EQUALIZER BARS

The Pennsylvania Railroad Company
Altoona, Pa., April 28, 1917.

To the Editors:

After reading Mr. Bullock's article on truck equalization, it occurs to me that he has entirely overlooked some of the fundamental principles of truck design in trying to favor the use of equalizer bars. No doubt every designer will agree that it is desirable that all trucks be equalized in some manner. But other statements made by Mr. Bullock should be proved by him, or will have to be taken as merely his personal opinion. Some of these statements are as follows:

1. "The manufacturer has in some cases eliminated the equalized construction and substituted a frame of rigid design, similar to the old arch bar.
2. "There are two objections to the design of truck with springs over the journal boxes: First, it is not properly equalized, and, second, it requires undue space over the journal box for its application.
3. "Efficient equalization requires a spring base less than the wheelbase."



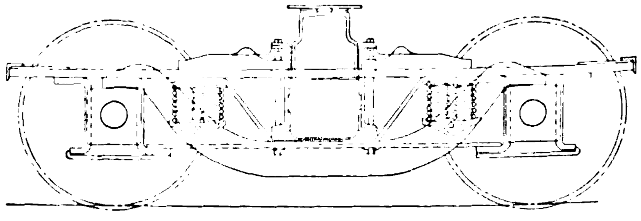
TRUCK EQUALIZATION—FIG. 2—DESIGN FOR CITY SERVICE PERMITTING FREE TRANSVERSE MOVEMENT OF BOLSTER

With regard to the first statement it may be said that the earliest four-wheel trucks of which we have knowledge had frames consisting of two longitudinal beams supported on the ends of the two axles, and a transverse beam supported on the centers of the longitudinal beams. The three beams were not firmly tied together. In such trucks the equalization was as perfect as in any modern truck; in fact, the equalization had to be perfect, as the roadbed at that time was much farther from perfection than any modern roadbed. The absence of truck springs resulted in hard riding qualities.

In analyzing trucks the equalization and spring gear must be considered separately, even though the deficiencies of one may be compensated by the other. The truck described above, though primitive, had an equalization which was fundamentally perfect but, lacking springs, rode hard. On the other hand, if the truck frame and transom is a solid non-flexible casting, supported directly on the journals, and the car body is supported on very flexible springs, the car may have easy riding qualities, but on bad track the truck will derail.

Clearly, therefore, track conditions govern equalization, and riding qualities govern the spring gear.

The arch-bar truck used in freight service is not a rigid design, as implied by Mr. Bullock in his comments on the design shown in Fig. 1. Each side frame is really an equalizer between the two axles. The tie between the two frames consists of a wide channel, applied flatwise directly under the bolster. The resulting truck



TRUCK EQUALIZATION—FIG. 4—TYPICAL EQUALIZER-BAR CONSTRUCTION FOR HIGH-SPEED INTERURBAN SERVICE frame is sufficiently flexible for any irregularity of present-day track surface, and is at least as flexible, in view of the transom design indicated, as that of Fig. 4, which has typical equalizer-bar construction.

The springs of the freight truck are cheap, and have but a small range of deflection. Trucks as shown in Fig. 4 have two sets of springs—one set of elliptic springs and one set of helical springs—in addition to bolster suspension, permitting bolster side motion. The better riding qualities are due only to the greater range of spring action and to the possible bolster side motion—not to equalization. If the freight truck, like Fig. 1, were provided with springs equivalent to those commonly used in trucks like Fig. 4, and if the bolster were suspended from hangers, the freight truck would have riding qualities equal to those ascribed to Fig. 4.

With regard to the second and third statements quoted after the first paragraph, I may say that the spring base of a truck should not be short, especially on cars with one brakeshoe per wheel. Tilted trucks under brake application illustrate the reasons for such statement. With non-flexible transoms between truck frames, the spring flexibility should increase in direct proportion to the distance of the spring from the transverse center line of the truck. If, however, the two side frames are held merely in parallel planes and are connected by a transom very flexible against torsion, it is immaterial whether the springs are over the boxes or between the boxes. Placing them over the journal boxes has the advantage of reducing the non-spring-supported weight of the truck, thereby reducing the hammering and consequent distortion of the rail at joints.

In all of the trucks to which Mr. Bullock refers, irregular track will cause torsion strains in the transom, requiring transom flexibility, or in lieu thereof spring flexibility between the truck frame and journal boxes. If, in trucks with stiff transoms, the spring flexibility is derived from springs with a spring base of, say, three-quarters of the wheelbase, the springs may have less flexibility than if they are placed over the boxes when compensating for track irregularities. But the springs should have the same flexibility for good track.

All this goes to show that equalization can be accomplished equally well in any existing type of truck and that springs of sufficient flexibility for comfort can be, and are, applied under the bolster and over the journal boxes. Consequently, the designer is free to select that type which can be produced for least weight and cost.

W. F. KIESEL, JR.,
Assistant Mechanical Engineer.

[NOTE.—Owing to the several references as made above to the illustrations published with Mr. Bullock's article of April 21, these have been reproduced herewith with their original captions.—EDS.]

Good Watches and Uniform Loading

HAMILTON WATCH COMPANY
LANCASTER, PA., April 30, 1917.

To the Editors:

I noticed with interest the editorial comment in your last issue on watch inspection. If the use of accurate watches by trainmen means as much as we think it does in the way of better service and more rapid schedules, and as you also seem to think, a very few dollars more for a good watch is a small price to pay for the resulting advantages.

I realize that when a railroad man has to purchase his own uniform and badge, and then a $20 to $25 watch in addition, it may seem somewhat of a hardship, but from a matter of dollars and cents it is a good economic proposition. When once railway men experience the satisfaction of owning a good watch I think they will not have any objection to the initial outlay. But if they do, practically every jeweler will be glad to sell a railroad man on time, particularly if the street railway company gives indorsement to the men's purchases.

When one considers that there are some 225,000 miles of railroads in the United States under official time inspection and that the railroad men all over this vast mileage are buying watches on this same basis, and for the most part buying a much higher grade and consequently more expensive watch than the street railway man would buy, it would seem only the natural thing to expect the railway men in the electric railway service to equip themselves with this same efficient safeguard. ROBERT E. MILLER.

AMERICAN ASSOCIATION NEWS

Committee on Rules

S. W. Greenland, Fort Wayne, Ind., and W. C. Callaghan, Norwich, Conn., of the T. & T. Association committee on rules, conferred in New York on April 26 with reference to possible changes in the rules. They concluded to recommend that no changes be made this year.

Committee on Libraries

A meeting of the committee on libraries, appointed at the mid-year meeting of the executive committee of the American Association in Boston, was held in New York on April 23. The function of this committee is to consider the promotion of electric railway libraries and the possibility of utilizing the association office as a clearing house for information regarding them. At the New York meeting it was decided to collect information regarding company library practice for use in framing a preliminary report.

The committee comprises L. A. Armistead, librarian Boston Elevated Railway; I. A. May, comptroller The Connecticut Company; C. C. Mullen, chief of the inspection bureau Pittsburgh Railways; R. H. Johnston, librarian Bureau of Railway Economics, and C. W. Stocks, statistician American Electric Railway Association. At the meeting were Messrs. Armistead and May, of the committee, and E. B. Burritt, H. C. Clark and A. Shapiro, representing the association. The committee will meet again at an early date.

Preparedness Program at Hartford, Conn.

The Connecticut Company section held its regular monthly meeting on April 25 at Hartford with 282 members and guests present, the record attendance so far. A program appropriate to the times was carried out as follows: Hal Fullerton, director of agricultural development, Long Island Railroad, spoke on "Agricultural Preparedness or How to Keep the Market Basket and the Haversack Filled." This was an illustrated talk explaining some of Mr. Fullerton's accomplishments in the line of agricultural preparedness achieved on his 22-acre farm on Long Island. Hon. George B. Chandler, compensation commissioner of the State of Connecticut, under the title "Preparedness and Transportation," explained in detail how transportation companies will form a vital link in rendering patriotic service in time of war. Major Frank Macomber, president Hartford Chamber of Commerce, spoke on "More Food Through Better Salesmanship." He offered several suggestions as to how the officers and employees of the Connecticut Company can spread among the farmers the gospel of proper marketing of their products, and said that an agricultural department or bureau might be established by the company.

Practical and Economical Solutions of Problems in

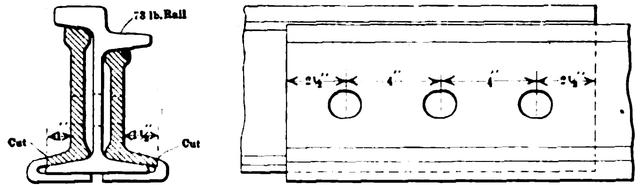
EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Economical and Effective Method of Repairing Old Rail Joints

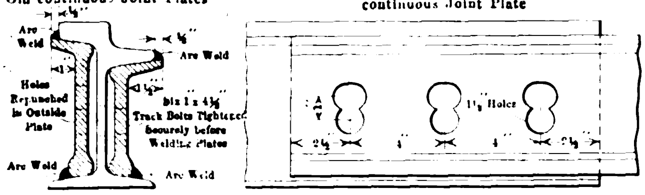
BY R. H. FINDLEY
Superintendent Track and Roadway Omaha & Council Bluffs Street Railway

In rehabilitating some of the old track in Omaha, Neb., in order to get a few years' more service out of it, a method of repairing the joints which has proved to be very effective and at the same time involves an expenditure per joint which is commensurate with the short additional life expected has been used on approximately 250 joints to date. The rail in this track is 73-lb. section No. 291 Lorain Steel Company tram rail with 26-in. continuous rail joints which have been in service about thirteen years. In rebuilding these joints, the joint plates are removed and taken to the company shop, where the portion of the plate which extends under the base of the rail is cut off in a shaper. The plates are then repunched and put back on the joints, but inverted. They are then bolted in place and electrically welded along the top and bottom edges with an Indianapolis welder. The angle of the top and bottom faces of the plates and that of the rail are very nearly the same, so that the plates fit snugly when put on in this inverted position. By putting the bottom of the rail joint under the head of the rail the plate projects ½ in. beyond the head on the outside and an equal amount beyond the tramway on the inside, so that it is possible to weld with the arc. In the normal position it would practically be impossible to weld the plate underneath the head. The welding is carried along the complete length of the joint plates, giving four lines of electrical and mechanical contact.



Cross-Section showing Old continuous Joint Plates

Elevation of One-Half of Old Outside continuous Joint Plate


¼"
Arc Weld
¼"
Arc Weld
1"
Holes Repunched in Outside Plate
1¼"
Six 1 x 4½" Track Bolts Tightened Securely before Welding Plates
Arc Weld
Arc Weld
A
1½" Holes
2½"
4"
4"
2½"

Cross-Section showing Application of Old Joint Plates after Cutting off Base, Inverting and Arc Welding to 73 lb.Rail

Elevation of One-Half of Inverted Outside Plate after Cutting off Base, showing Punching of Holes

DETAILS OF RAIL JOINT REBUILT BY REVERSING PLATES AND WELDING

The new holes, punched in the plates to line up with the holes in the rail, overlap the old ones slightly. But inasmuch as the welding prevents movement of the plates relative to the rail the function of the bolts is not so important, and further there is no weakening of the web in the longitudinal direction in which the greatest stress occurs.

The cost of the joint, including the expense of tearing up and replacing the pavement at the joint, the labor of cutting off the base of the plates and repunching them, the installing and welding, and the cost of six new bolts and about 7 lb. of welding metal per joint, has averaged less than $4.50 per joint. A more permanent weld with new splice bars, such as the Lorain electric weld or the Thermit weld, is considered too high in cost to warrant its use in repairing this old track. And since the web of the rail has become less than ¼ in. thick it is considered of insufficient weight and strength satisfactorily to take a heavier weld. Where the head of the rail is cupped out at the joint it is built up with the welder. As soon as completed all joints are rough-ground with a home-made grinder and are later finished with a reciprocating grinder. The cost of this work is included in the above figure.

Single-Truck Cars Remodeled Into One-Man Type

Other Kansas City Railways' Modernization Work Includes Splicing Two Single-Truck Cars to Form One Double-Truck Car

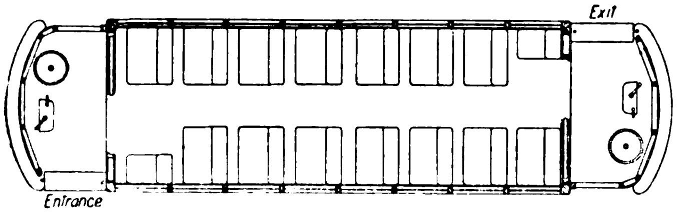
The remodeling of surface cars is being undertaken in the shops of the Kansas City Railways as rapidly as the requirements for heavy traffic will permit. The modernization comprises the rearrangement and refitting of the interior, the redecorating of both interior and exterior and, with some cars, the actual reconstruction from the trucks up, to the extent of splicing two single-truck cars to form one of the double-truck type. During the past year 1200 cars of all types were repaired at the shops, where $600,000 is being spent annually.

The work of converting old single-truck cars into cars of a one-man-operation type is being carried on at present at a cost of about $600 per car. The reconstruction includes the laying of a new floor, the replacement of the front bulkhead by an arch, and the formation of an opening of increased size in place of the rear bulkhead doors. Two new vestibule doors are being installed at the front and rear of the car, both on the curb side. The rear door, for use in emergency only, is held closed by a folding seat and opens automatically when the seat is raised. A buzzer alarm circuit extends from the rear to the front platform. All of the seats were set crosswise in the old car, but half of these are now being replaced by longitudinal seats, one of which is shortened to allow free access to the combined entrance and exit, where the doors and steps of the folding design will be installed. In front of the longitudinal seats are installed four stanchions.

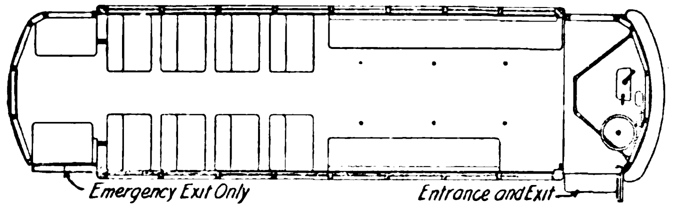
The seats themselves are washed and varnished by a machine which restores them to their original appearance. The former wood siding is replaced with steel.

The operating equipment in the rear end of the car is removed and the rear platform made part of the main car, while in the front end a railing is placed around the motorman's position, where fares will be collected by the motorman-conductor, who also operates the cars without changing position, although for the convenience of passengers fare boxes may be installed. The register equipment is being converted into a double register so that it may be used by the motorman-conductor or by an additional conductor if one becomes necessary.

As previously stated, the rear platform by being raised 9 in. is made part of the main car floor, necessitating a step at the emergency door. Another addition to the rear is an electric tail-light outfit.



FLOOR PLAN OF SINGLE-TRUCK CAR BEFORE REMODELING



FLOOR PLAN OF SINGLE-TRUCK CAR AFTER REMODELING

One of the heaviest pieces of remodeling was that undertaken a few years ago when fifty double-truck cars were made by splicing 100 single-truck cars. Cuts were made at the second windows or about 5 ft. from one end of the single-truck cars, which were 21 ft. over the body, or about 5 ft. from the ends, making the completed new body 32 ft. 7 in. in length. The seating arrangement consisted of longitudinal and cross-seats. A longitudinal seat was placed at each end on opposite sides, and the cross-seats were arranged in like manner, thus giving plenty of aisle room. Each car cost approximately $1,500. The cars have given general satisfaction and have proved sufficiently large on heavily taxed lines.

Dustless Ash Removal

A recent issue of the *Electrical Review*, London, contained a description of a system of ash removal by the employment of which the conveying of the ashes is done under water.

Below the boilers is a concrete conveyor trough partly filled with water. The chutes leading from the ash hoppers under the boilers dip below the surface of the water in the trough, thus forming a dust seal. The conveyor scoops are linked closely together and are carried by rollers running on rails mounted on the top of the trough. A third rail on the bottom of the trough, in the middle, prevents the conveyor from rubbing on the bottom.

The delivery end of the trough is inclined upward to retain the water in the trough and to provide a chute for delivering ashes to cars conveniently located outside the boiler room.

Asbestos and Varnish Make Good Field-Coil Insulation

This Combination Is Particularly Effective Where Motors Are Subjected to Severe Overloads, but Present Price of Asbestos Makes Method Expensive

BY F. J. FOOTE
Master Mechanic Ohio Electric Railway, Columbus, Ohio

The specifications for winding and insulating field coils which were given in the March 17 issue of the ELECTRIC RAILWAY JOURNAL, in the article on motor maintenance at Providence, were of special interest to me, since I have given a great deal of attention to the subject and like to know what others are doing.

Where the motors are not overloaded the method described for insulating the field coils should give excellent results. The writer believes firmly in the modern method of impregnating in a vacuum, where possible, but if the specifications mentioned in the article are carefully carried out this should insure about as long life to the coils as is secured by impregnating. Where the motors are required to carry heavy overloads, however, I have found by costly experience that oiled linen and cotton webbing, while giving excellent insulation to start with, soon disintegrate from the heat, and break down.

Because of excessive overloading of certain motors I was compelled, several years ago, to do something to keep the field coils in service longer, and my attention was called to the possibilities of using asbestos tape with insulating varnish only. At first this did not appeal to me, on account of the well-known low insulating value of asbestos. However, a careful investigation of some old motors having field coils thus insulated, which had been standing up under excessive overloads, was convincing, and the following specifications covering the insulation of strap-wound coils were made up, and have been followed for some time:

1. Wind coil sections with asbestos paper insulation between turns; put on terminals.
2. Put sections together with ⅛-in. asbestos paper or board separators.
3. Bind sections together in place with a few turns of cheap open-weave webbing.
4. Heat coils in oven over night to remove moisture, and in the morning dip while hot in insulating varnish.
5. When dry enough to handle remove the temporary webbing. Wrap with one layer of close-weave, medium-weight asbestos tape, not overlapped.
6. Dip in insulating varnish.
7. When dry enough to handle wrap with a second layer of the same grade of asbestos tape one-half overlapped.
8. Dip in insulating varnish. Drain, and bake over night in oven.

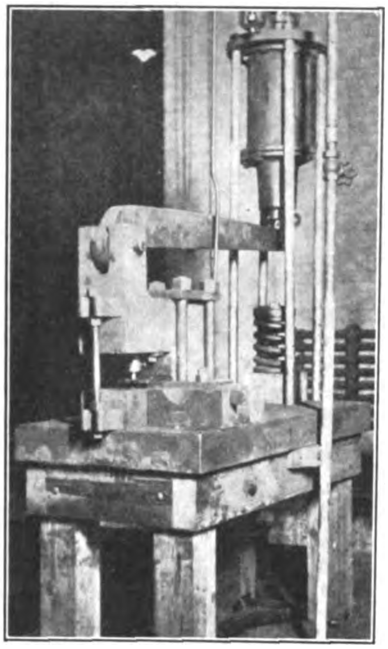
By this process the asbestos tape is thoroughly impregnated. This is an important feature, for as was pointed out some time ago in an A. I. E. E. paper by B. G. Lamme, chief engineer Westinghouse Electric & Manufacturing Company, the heat is transmitted largely through the varnish, regardless of the kind of tape used.

I have found that this method of insulating gives by far the best results of any method yet tried where the motors must operate at a high temperature. The specifications which I have given apply only to strap-wound fields, as we do not undertake to rewind any round-wire fields. We have, however, reinsulated some of our old wire-wound fields by this method. Unfortunately, the present condition of the markets prevents us from following the above specifications, but as soon as asbestos is again within reach we expect to have all fields insulated in this way.

Home-Made Air-Operated Punch

BY G. B. SISSON
Mechanical Department Georgia Railway & Power Company, Atlanta, Ga.

Recently we had a line department job of punching 18,000 holes in the braces of pole-top fittings. To do this our master mechanic, J. E. Eaves, rigged up a pneumatic punch out of an old 8-in. brake cylinder. This punch is operated at 80 lb. to 100 lb. pressure per square inch and will punch holes up to 9/16 in. in diameter in rough stock ½ in. thick. It will turn out the work ten times as fast as it could be done by drilling, and it also saves the cost of the drills. The punches are interchangeable.


AIR-OPERATED PUNCH WITH HEAVY SPRING WHICH ACTS AS A SHOCK ABSORBER

The pressure exerted on the lever is so powerful that the punch goes right through the stock, and in order to prevent its being stopped with a shock the spring shown under the air cylinder in the accompanying illustration is provided to catch this lever and act as a shock absorber.

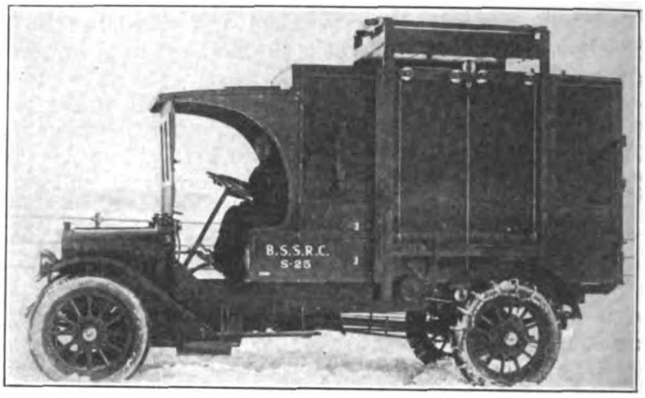
The controlling mechanism is made from a globe valve changed to act like a whistle valve. This is operated by means of a pedal. The punch has been found to be a convenient tool, and it paid for itself on the first job on which it was used.

Sea Air No Tonic for Gulfport Cars

The interurban cars of the Gulfport & Mississippi Coast Traction Company, Gulfport, Miss., are being put through the Gulfport shops for a general overhauling. Because of the proximity to the salt water the equipment on this road is more than ordinarily subjected to the effect of damp air, and for this reason special protective measures are being taken. The road does a city and interurban service along the coast of the Gulf of Mexico in the southern part of Mississippi. Its tracks are parallel to the gulf shore and for nearly 20 miles are laid within 200 ft. of the water's edge.

In overhauling the cars new yellow pine creosoted sills are being installed which before installation are treated with a brush coating of Barrett's refined "Carbosota." The wooden sheathing of the cars is being removed, the framing repaired where necessary, and the cars are being newly plated with steel panels.

According to W. F. Gorenflo, general manager, the proximity to the ocean and consequent dampness makes it almost impossible to maintain composition ceilings in the cars. For this reason during the reconstruction new steel ceiling plates are being installed, and these are being covered with white enamel. The seats in the cars also are being recovered with Dupont fabrikoid. After the completion of the shop work the cars are painted a yellow color slightly darkened with umber, except the letter boards, which are painted red.



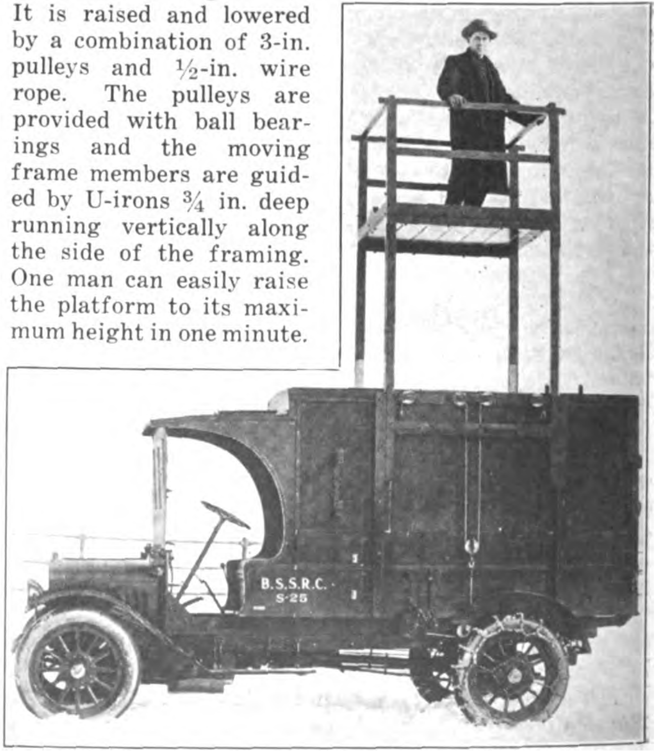
NEW BAY STATE TRUCK WITH PLATFORM LOWERED

New Tower Truck of Compact Type

Compactness and Availability of Entire Interior of Body for Materials and Tool Storage Are Features of This Bay State Truck

Three motor-driven tower trucks of an unusually compact type have recently been placed in service on the Bay State Street Railway, the design having been made by Frank M. Spicer, general line superintendent of the company, Boston, Mass. The equipment consists of a special body, a platform and supports carried on the chassis of a standard General Motors Company ¾-ton truck, driven by a four-cylinder gasoline engine. The platform has a total lift of 4 ft. 6 in., and when lowered and folded is carried at a height of only 9 ft. above the ground. When extended it reaches a maximum height of 16 ft. A notable feature is the availability of the entire interior space of the truck for carrying tools and supplies.

The body of the truck has sides of hard pine sheathed with leather and supported by 2-in. by 1½-in. oak posts, spaced about 10 in. apart and forming a stiff frame. The working platform, 4 ft. 6 in. long by 3 ft. 8 in. wide, is carried on four similar posts reinforced at the corners with angle-irons. It is raised and lowered by a combination of 3-in. pulleys and ½-in. wire rope. The pulleys are provided with ball bearings and the moving frame members are guided by U-irons ¾ in. deep running vertically along the side of the framing. One man can easily raise the platform to its maximum height in one minute.

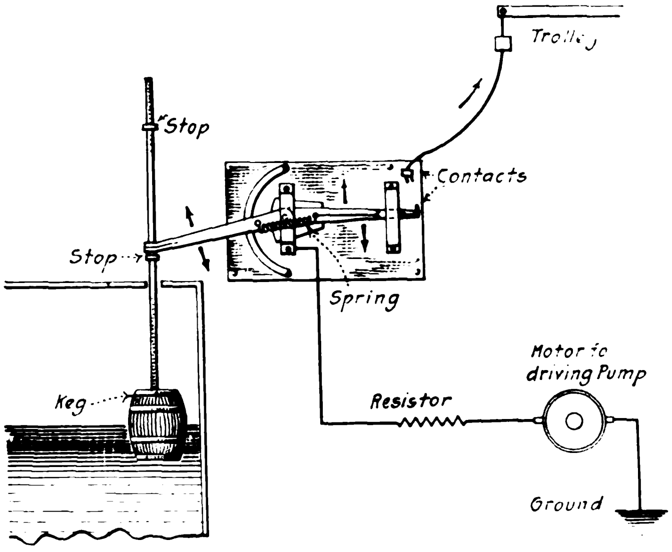


NEW BAY STATE TRUCK WITH PLATFORM RAISED

The platform is held at any desired point by a pawl which is unlocked in lowering by means of a hand lever also attached to a band brake nearly encircling the winding drum, so that the lowering is gradual and handled without danger of over-speed. The use of a central traveling pulley results in uniform application of force in raising the platform and in controlling its descent. The platform and its supporting posts weigh about 500 lb. Lockers with outside doors are provided in the sides to save trips around the end of the truck to get small tools and supplies from the interior, and the roof of the hood is provided with a hatch about 18 in. square, so that the driver can observe a man at work on the platform and, if desired, pass up tools and supplies without leaving his post. The trucks are used in signal maintenance and other light repair work as well as on the overhead system, and are capable of being operated at speeds of from 25 to 30 m.p.h. Access to the top is provided by fixed iron-ladder rungs on the side of the body, and hooks for a portable ladder are also provided.

Home-Made Switch to Operate Sump Pump

A satisfactory method of automatically draining a low place on a right-of-way has been in operation for some time on the Inter-Urban line, Des Moines, Iowa.



APPARATUS FOR AUTOMATIC CONTROL OF MOTOR-DRIVEN SUMP PUMP

A regular bilge pump could not be installed to give satisfactory operation on account of the poor voltage regulation on both the alternating-current and direct-current circuits at this point. As a substitute an old GE-1000 motor is belt-connected to a pump, and the outfit is covered over with a small housing. The motor is cut in and out automatically by the apparatus shown in the diagram, a small shellac keg of 1 cu. ft. capacity being used as a float in the well of the sump. This operates a vertical rod equipped with two stops which actuate a lever connected by a coil spring to a knife switch which makes and breaks the motor circuit. As the keg forces the arm over past the center position, the direction of pull of the spring is changed until the lateral component is sufficient to throw the switch arm over and operate the switch.

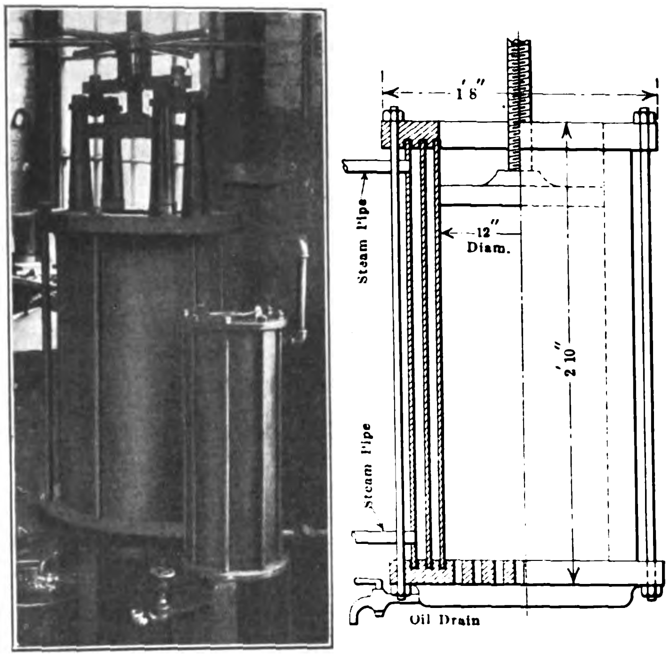
A study of the stock transfer records of the Cities Service Company, New York, N. Y., brings out the interesting fact that the company now has 11,183 stockholders. Of these 4232 or 38 per cent are women.

Reclaiming Waste and Lubricating Oil

Steam-Jacketed Press and Filter Used in Buffalo, N. Y., Effectively Cleanse Waste and Remove Grit from Oil

In the Cold Spring shops of the International Railway, Buffalo, N. Y., a steam-jacketed waste press and a steam-jacketed oil filter are doing splendid service at a practically negligible cost. Dirty, oily waste put through the former comes out practically as good as new, the oil being melted and squeezed out. In the filter the oil is rendered more fluid by the heat of the steam jacket, and the grit and dirt brought over from the waste press are left behind in cheesecloth and perforated screen sieves. The use of this equipment produces a saving of about 65 per cent of the oil and the waste is practically all recovered.

The details of the apparatus are shown in the accompanying photograph and line drawing. The oil press consists of a cylinder and a compressing piston. The cylinder is made of three pieces of steel pipe, 30 in. in length and respectively of standard 12-in., 14-in. and 16-in. sizes. They are held in compression between two thick cast-iron heads by means of six bolts extending from head to head. The ends of the pipe fit into grooves turned in the faces of the heads, the joints being packed with lead. The outer annular space forms the steam jacket, steam pipes being tapped in at the top and the bottom respectively through the outside shell. The inner annular space is the oil well, and it connects with the bore of the cylinder by means of numerous perforations in the inside pipe.



STEAM-JACKETED WASTE PRESS AND STEAM-JACKETED FILTER IN SHOPS OF INTERNATIONAL RAILWAY—DETAILS OF CYLINDER OF WASTE PRESS

The bottom head is perforated and below it is a galvanized iron pan which acts as an oil reservoir. A stop cock tapped into this permits the reclaimed, dirty oil to be drawn off from time to time. The cylinder is supported on strap iron legs attached to the bolts previously mentioned.

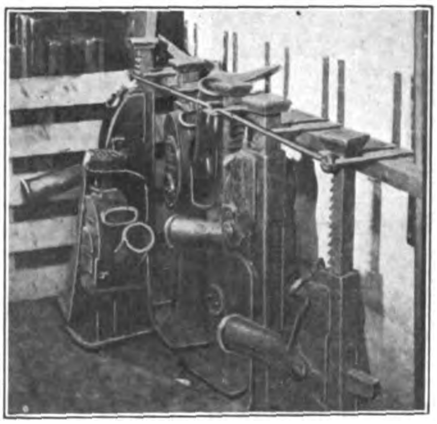
The piston is driven into the cylinder by means of a spoked nut traveling on the threaded piston stem, mounted as shown in the photograph.

The filter is of the same general construction as the cylinder of the press but is smaller. It is made of three pieces of steel pipe, 6 in., 7 in. and 8 in. in diameter respectively and 24 in. long. In the center is a screen of brass wire of the finest mesh obtainable. Over the screen are two layers of cheesecloth. The screen can be removed from the filter by means of a bail.

The equipment described above is located in the boiler room at the shops where steam can be conveniently obtained. It is operated by the boiler tender whose procedure is to allow a barrel of oily waste to accumulate and then to put this quantity through the press at one time. This can be done in two or three hours, the main consumption of time being in waiting for the oily waste to become heated through.

Rack for Jacks in Emergency Car

Crews on emergency cars are sometimes hard pressed to find a convenient space for jacks. On a new emergency car completed by the Union Street Railway, New Bedford, Mass., the jacks are carried in the rack shown in the accompanying illustration. A 4-in. x ½ in. wooden bar is attached to the side of the car, and the jacks are held rigidly against this bar by two rods ½ in. in diameter. To release the jacks it is necessary only to unhook these rods. This rack while simple in construction has been found convenient and serviceable, and there is no danger of a jack's falling upon any member of the emergency car crew.



CONVENIENT RACK FOR HOLDING JACKS

Washing Cars Instead of Sweeping Them

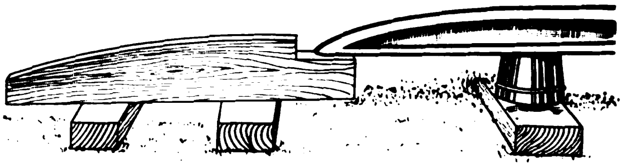
The practice of flushing cars with water instead of sweeping them has been found in Des Moines, Iowa, to expedite the cleaning and to be satisfactory provided the cars are suitably prepared. The thorough cleaning of cars was formerly done by women using hot water and "Gold Dust," and one steam-heated bay of the carhouse with a capacity for twenty cars was utilized for this purpose. Under the present plan one truck of a car is run up on a hose jumper so that there is about a 4½-in. difference in height in the two ends of the car. One man then goes through the car with a hose and thoroughly flushes the floor, starting from the high end, and another man follows him through with a broom and sweeps the water and dirt out of the car as quickly as possible.

In order to make this scheme practicable, the heater ducts were raised 3 in. or 4 in. above the floor, the air compressor governor was installed in a cabinet in the front bulkhead and all obstruction possible to the free flow of the water and free movement of the broom was removed from the floor. By handling the hose carefully and sweeping the water out promptly the company has experienced no trouble from water leaking through the trapdoors into the motors or getting into the air governor.

The same scheme is used in washing the car exterior, using the hose and a brush, and washing with plain water. By this means it has been possible to save 80 per cent of the time formerly required to wash a car, and there are sixteen to twenty cars washed per day on the Des Moines property.

A Guard for Third-Rail Approaches

Trouble is sometimes caused by faulty third-rail shoes getting below end approaches and thus breaking the insulators and tearing up the rail. The accompanying sketch shows how this is prevented on one railway property by a wooden block placed in front of a third-rail approach and securely nailed to the ties. Sufficient clearance is left between the ends of the block and the rail to allow for the expansion of the latter. It has been found that no real harm results if the block accidentally comes in contact with the rail since the leakage is small even in wet weather.

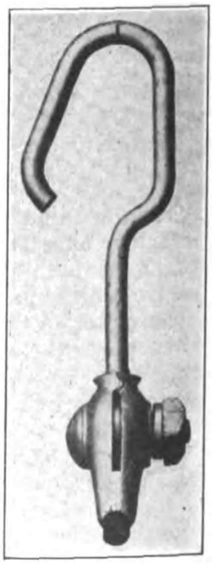


GUARD TO PREVENT THIRD-RAIL SHOES FROM GETTING UNDER THE RAIL

A Catenary Hanger with But Five Parts

The Westinghouse Electric & Manufacturing Company has placed on the market the hanger illustrated on page 380 of the issue of the ELECTRIC RAILWAY JOURNAL for March 3, 1917. As stated in the article describing the construction of the new Buffalo-Niagara Falls high-speed line this hanger is being used on that line. It is to be known as type NF and contains five parts; bolt, nut, washer, hanger rod and clamp.

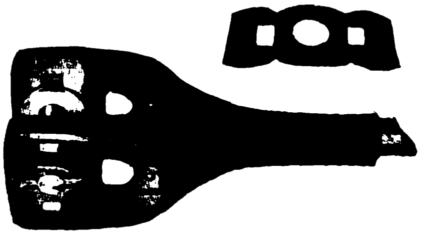
The hanger rod consists of a ⅜-in. steel rod with an oblong loop at the upper end for attaching to the messenger cable. After the hanger is in place this loop can be closed very easily. At the lower end of the hanger rod is a loop with a round opening for connecting to the clamping bolt. The clamp is made in duplicate parts of malleable iron. In the design the lips of the clamp were made with minimum thickness to secure satisfactory operation with wheel trolleys, and the nuts and spring washer were so located that when the groove of the trolley wheel is worn to the maximum depth there will be no tendency for the flange to strike the bolt. The hanger is suitable for standard grooved-section trolley wire from No. 00 to No. 0000, and its average weight for 150-ft. spans is 1 lb. All parts of the hanger are sherardized.



FIVE-PIECE CATENARY HANGER

New Contact Spring for Trolley Harps

The accompanying illustration shows the Kalamazoo trolley harp and the new design of springs with which they are being equipped by the makers, the Star Brass Works, Kalamazoo, Mich. Since the springs are not riveted to the harp, renewals can be readily made without removing the pole from the car. The contact surfaces are large, thus giving a good current capacity and adding to the life of the pins and bushings.

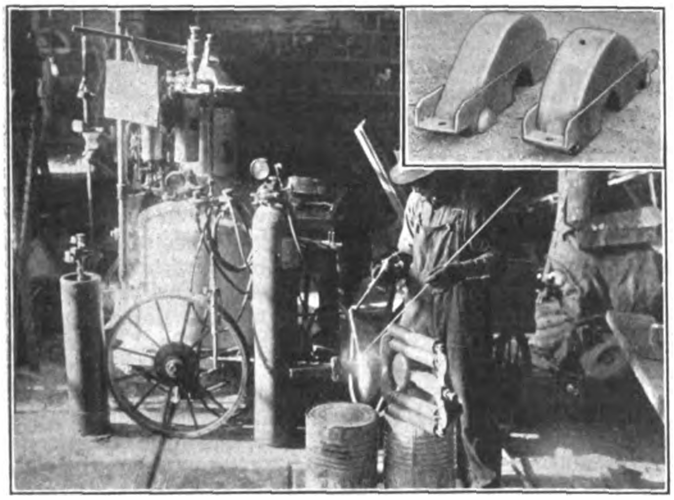


CONTACT SPRING FOR TROLLEY HARPS

Oxy-Acetylene Welding Practice in Des Moines Shop

Different uses to which oxy-acetylene gas can be put in an electric railway shop are constantly being discovered by M. M. Lloyd, master mechanic Des Moines (Iowa) City Railway. On the new low-floor cars in Des Moines the gear cases have a clearance of only 2 11/16 in., and hence they often strike a stone or other obstruction on the roadway. This may make a dent in the case, and then the gear teeth cut a hole. The accompanying illustration shows a gear case with such a hole in it and one in which a similar hole has been quickly and easily repaired by welding a patch over the hole.

Worn center bearings on Westinghouse D2EG and D3EG air compressors are built up by the welding process. The babbitt is first taken out and the bearing filled in with metal to a depth of ½ in. or ⅝ in., after which the compressor case is placed in a drill press and the bearing housing bored out and fitted with a brass bearing. Worn journal side-plate bearings are also built up. The bearing way is filled and the journal is put on a planer and squared up, thus renewing the journal for a long period of service. The maintenance on the door-operating handles on a number of the cars was materially reduced by welding. These handles were previously riveted or held to the vertical rods with set screws, and trouble was constantly experienced by their breaking off. To remedy this they were permanently welded in position.



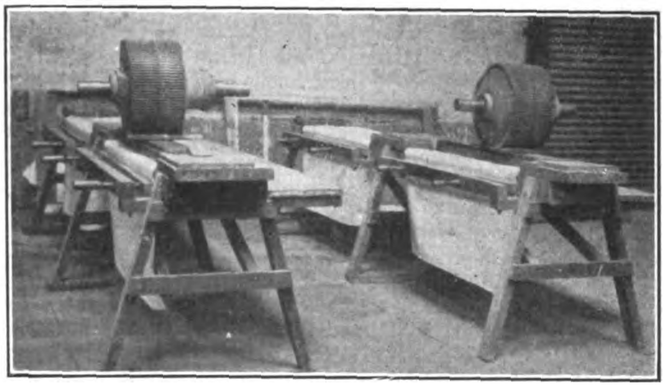
PORTABLE ACETYLENE GENERATOR IN DES MOINES SHOP; AT TOP, PRESSED-STEEL GEAR CASES, DAMAGED AND REPAIRED

The oxy-acetylene cutting frame was used to good advantage in a case in which it became necessary in the reconstruction of an electric locomotive to cut the door in the operating cab 5 in. wider. This meant the cutting of the ¼-in. steel side sheet through a vertical distance of 6 ft., and it was done readily with the acetylene flame, whereas it would have been a considerable problem to accomplish cutting by mechanical means.

The portable oxy-acetylene generator shown in the accompanying illustration is employed. Whenever a heavy casting or a particularly difficult piece of welding is to be done, it has been the practice to preheat the piece by the use of a home-made coal-oil burner connected with the shop air-pressure system.

Curtain Printing Press Used at Nashville

At the shops of the Nashville Railway & Light Company, Nashville, Tenn., of which George W. Swint is master mechanic, a printing press has been built for lettering destination sign curtains. By the use of this press the cost of the work is said to be reduced and the results obtained are uniform.



FOUR-SECTION PRESS FOR PRINTING DESTINATION SIGN CURTAINS

As shown by the illustration, the outfit includes four sections alike in arrangement. Each section consists of a narrow table somewhat longer than the width of a sign curtain. The sides of the table are equipped with clamps so that the cloth to be printed may be stretched over the bed of the table and held tightly in place. The signs are printed on sections of cloth each 44 in. long, and a wooden silhouette letter is used. The letters are cut out of white pine blocks and mounted on boards of uniform length so that they may be stored in racks near the press.

A combination of printers' ink and drop black is used for printing. When the type has been inked and laid in place on the cloth, an old armature core is rolled over the back of the type in order to press it firmly against the cloth. By means of the four sections of this press four similar curtains are printed at one time, the sets of type being moved from one section to the other as the cloth is moved along in each of the presses.

The largest smokestack in the Illinois River valley is being erected by the Illinois Traction System at La Salle, Ill., to serve the rebuilt power plant of the Northern Illinois Light & Power Company. This stack will be 265 ft. high and 16 ft. in diameter at the base. It is being constructed of steel, with brick lining.

News of Electric Railways

Traffic and Transportation

Financial and Corporate — Personal Mention — Construction News

Dallas Charter Amendments Upheld

Court of Civil Appeals Upholds Election at Which Charter Was Amended, Making Possible Transit Settlement

The Court of Civil Appeals of the Fifth District of Texas has upheld the validity of the city election of April 4, 1916, at which the charter of the city of Dallas was amended to authorize the granting of indeterminate franchises and the model service-at-cost franchises were approved. As a result J. F. Strickland and C. W. Hobson are free to accept the electric light and traction franchises voted by the city of Dallas, Tex., on April 3, 1917. Messrs. Strickland and Hobson have ninety days from April 3 under the terms of the franchises in which to accept them. In view of war conditions and pending settlement of the injunction proceedings against the enforcement by the city of the initiated ordinances adopted at the last city election, Messrs. Strickland and Hobson say they may ask the city for an extension beyond the ninety-day period.

The contention of attorneys for the traction and lighting interests is that at least one of the initiated ordinances is in conflict with the terms of the franchises in that it prohibits the raising of rates without the approval of a majority of the voters of the city, whereas the franchises provide for increases in rates under the London sliding scale. Another ordinance providing for the installation of safety devices is held to be covered in the franchises as granted.

The traction and lighting franchises are affected by the charter amendments in that the amendments provide for a service-at-cost plan in lieu of the 4 per cent gross income tax, as provided in the charter. By being forced to pay the 4 per cent tax, the grantees claimed they could not have accepted the franchises, which provide that all profits of more than 8 per cent shall be used in reducing fares.

The contest of the election on April 4, 1916, attacked the authority under which that election was held and also sought to have it declared illegal because of certain markings on the ballot appearing as explanations of the amendments and franchises to be voted on. The court found no grounds for contest of the election and declared it legally conducted. If the decision had been in favor of the contestants the authority for holding the election would have been lacking and the results of the election void. This would have voided the charter amendments and the franchises.

Senate Passes Commission Bill

New York State Body Favors Measure Based on Recommendations of Chairman of Legislative Investigating Committee

The Senate of the State of New York on May 1 passed the bill introduced by Senator George F. Thompson of Niagara providing for the reorganization of the Public Service Commissions of the State. The bill was drafted as a result of the investigation of the commissions made by the legislative committee of which Senator Thompson was chairman. Under the provisions of the Thompson bill the present Public Service Commissions would be divided into three divisions, namely, one so-called hearing division composed of three commissioners to conduct hearings and make decisions and two regulatory divisions each made up of three commissioners, one for New York City and one for the rest of the State. The headquarters of the hearing division and the up-State regulatory division would be at the State Capitol, while the activities of the public service corporations in Greater New York would be supervised as at present from headquarters in New York City. The powers of supervision over the construction of new subways exercised at present by the Public Service Commission for the First District in Greater New York would under the Thompson bill be turned over to a rapid transit commissioner, after the present work has been completed. The appointment of the rapid transit commissioner is placed with the Governor. This provision has been assailed as a violation of the home rule principle. The measure will now go before the Assembly. Should it be passed there and then be approved by the Governor, the Public Service Commissions as at present constituted would be succeeded by the new order of things on June 30.

Union Terminal for Los Angeles

Pacific Electric Railway, Southern Pacific Company and Salt Lake Railroad to Combine Entrances to City

The Southern Pacific Company, the Salt Lake Railroad and the Pacific Electric Railway, it is announced, will in a few days begin work on the reconstruction of the entire trackage layout on which they enter the heart of Los Angeles, Cal. Briefly summarized, the plans are as follows:

1. Merging of the Southern Pacific and Salt Lake station accommodations at the new Southern Pacific station, Fifth Street and Central Avenue.
2. Abandonment of Alameda Street by the Southern Pacific, except for local switching to industrial establishments.
3. Joint use by the Southern Pacific and the Pacific Electric of the Salt Lake Railroad right-of-way on the east bank of the Los Angeles River.
4. The construction of a bridge across the Los Angeles River and an elevated track from the Los Angeles River, to the rear of the Pacific Electric station at Sixth and Main Streets, with branches connecting with the Arcade station and the Wholesale Terminal Company's $10,000,000 establishment.
5. Reconstruction of the freight yards on the east side of the river and establishment of a new industrial district, where five big manufacturing plants, including a cotton mill, steel mill and other industries will be located.

The objects which are sought to be achieved are:

1. To effect a virtual union station arrangement; permanently anchoring the railroad stations, or union terminal, in a central location.
2. To eliminate as far as possible all grade crossings in the heart of the city, and to eliminate from the congested west side of the river the freight and passenger traffic, and to pave the way for a union freight classification and switching yards on the east side of the river.
3. To provide a shorter entrance without grade crossings to the heart of the city for both the steam roads and the Pacific Electric Railway high-speed trains.

Under the proposed arrangement the Pacific Electric Railway will bring its trains into Los Angeles by way of the Salt Lake Railroad right-of-way, the inside portion of which will be leased for ninety-nine years, and will cross the Los Angeles River between Sixth and Seventh Streets, on an elevated track, which will be continued from the river up through the middle of the block, between Sixth and Seventh Streets, to connect with the present elevated structures at San Pedro Street. The cost of the new work has not been made public. It is expected that the new route will permit the Pacific Electric Railway to reduce the running time over its line between Los Angeles and Pasadena by twelve minutes.

Santa Fé Electrification Rumors

Edward P. Ripley, president of the Santa Fé system, was in San Francisco, Cal., recently as the head of a party of directors and officials of the company. During his stay there the question of possible electrification of some of the lines was raised. Mr. Ripley is reported to have said:

"The time for any definite statements is not yet ripe. Nothing has been offered us as yet which would give us an opportunity to go ahead with any actual plans. It is true, however, that overtures have been made, and if we can see our way clear profitably to do so we will electrify divisions of the Santa Fé lines."

One of the party stated that a plan had been submitted to dam the Colorado River 21 miles north of Peach Springs, and to generate electricity from that source. This gentleman is reported to have said:

"It is natural that with the ever increasing price of oil we are figuring on some way out. Electrification seems to be the only way. But the cost of electrifying has always been so enormous that the railroads could not see their way clear to pay for the investment in a reasonable time. But if someone can make us a proposition whereby the extraordinarily low cost of power would offset the cost of equipment the situation would be different."

With President Ripley were W. D. Hines, president of the board of directors; A. D. Juillard, director; W. B. Storey and W. E. Hodges, vice-presidents; A. G. Wells, general manager, and Ford Harvey.

Seattle Conferences Progressing

At a conference between representatives of the city of Seattle, Wash., and the Puget Sound Traction, Light & Power Company, held on April 25, virtual agreement was reached that an exchange of power should take place between the city's municipal plant and the plants of the company, in case of a break-down in either system. A. W. Leonard, president of the company, promised to submit a schedule of rates for such emergency service as soon as they could be ascertained.

A proposal to operate cars of the Puget Sound Traction, Light & Power Company over Division "A" of the municipal railway system, from the south end of the Fremont Bridge to Third Avenue and Pine Street, in order to relieve the congestion of Westlake Avenue, and a proposal to construct a new line on Stone Way to accommodate the Seattle-Everett interurban cars, were the outstanding features of the conference. Six car lines and the interurban road are now operated over Westlake Avenue, as the only route to the district north of the Fremont Bridge, and by the utilization of Dexter Avenue, on which city cars are now operated, the congestion on Westlake Avenue would be relieved, and two direct avenues of traffic between the great district north of the canal and the downtown district would be made available. Mr. Leonard of the company expressed a willingness to consider the establishment of the proposed line on Stoneway for the accommodation of the interurban, and also promised to look into the maintenance of a new line to serve the district lying east of Woodland Park and between there and the Green Lake and Meridian lines.

Reconstruction of the Fremont-Ballard and Sixth Avenue Northwest lines on Leary Avenue, in order to avoid a multiplicity of right-angle curves in the existing routes, was discussed. A. L. Kempster, manager of the Puget Sound Company, announced that the company would be glad to make the change. The same attitude was expressed relative to the reconstruction of the Fauntleroy Avenue line on Avalon Way and Thirty-fifth Avenue Southwest, in order to eliminate dangerous crossings and the operation of cars over heavy grades.

Before the conferences being held between the city and the company are concluded, Councilman Erickson will propose a partial reconstruction of the street railway system in order to serve the industrial district in the vicinity of Harbor Island and the Duwamish Waterway, and lessen the congestion on downtown business streets. The plan has been partially worked out. It includes among other things a ferry and the building of street railway lines to carry passengers who will utilize the water routes.

Increase in Wages in Bangor

Twenty Per Cent Fund Established—Co-operative Committee Organization Launched

The Bangor Railway & Electric Company, Bangor, Me., has adopted the so-called 20 per cent fund as a basis of payment of wages to its trainmen. During the ten years ended with 1915 the company paid 17.7 per cent of its gross passenger earnings in wages to the motormen and conductors in the passenger service alone. The officers of the company have studied the subject and believe that the amount the company is able to pay for wages is limited to 20 per cent of the gross passenger earnings. They have therefore decided to use 20 per cent of the gross passenger earnings in payment of the wages of conductors and motormen, but in no event will the rates of wages be lower than the following: First year, 25 cents an hour; second and third year, 26 cents an hour; fourth year and thereafter, 27 cents an hour. As just stated, these are the minimum wages to be paid. Starting on May 1 the company began to set aside in a separate fund 20 per cent of its gross passenger earnings, and all payments of passenger conductors' and motormen's wages will be made from this fund. Any accumulations in the fund will be used to increase rates of pay as fast as the condition of the fund justifies. The minimum wage of 25 cents as now fixed is an increase of 1½ cents an hour over that previously in force.

The company has also proposed to the men the formation of a co-operative committee which shall be composed of two motormen and two conductors selected by them from their own ranks, the superintendent of transportation and the assistant general manager or such other representative of the general manager as he shall appoint. The representative of the general manager is to be chairman of the committee. This committee is to meet at least once a month to discuss ways and means to improve the service and the working conditions and wages. It is not intended to abridge the control of the officers of the company over employees or the management, but through this committee there will be an opportunity for the representatives of the men to keep themselves fully informed as to the measures which the company takes from time to time to maintain the discipline necessary to a safe and efficient service. The representatives of the men upon this committee are to have the right to appeal to the highest operating official of the company should they at any time have reason to doubt the fairness of any decision of the chairman of the committee.

Strike on Indiana Line

As a result of the work of union labor organizers the conductors and motormen of the South Bend city lines of the Chicago, South Bend & Northern Indiana Railway went on strike on April 29. About 117 men are affected by the strike order. During Sunday only ten cars were operated by the company and no attempt was made to operate after dark. Demands were made upon the company for increased wages, shorter working hours, recognition of the union, etc. Trainmen on the interurban lines of the company, operating from South Bend to Elkhart, Goshen, Laporte and Michigan City, Ind., and Niles, Berrien Springs and St. Joseph, Mich., refused to join the union of the city trainmen, but presented a petition as individuals for an increase of wages on a sliding scale from 27 to 35 cents an hour. There was no interruption in the interurban service.

The company agreed to meet a committee of the interurban men and consider their petition, but F. I. Hardy, general manager of the company, refused to consider any demands presented by the union. A proposition was, however, made to the striking employees that their demands for increased wages and shorter working hours should be presented by them as employees of the company, and that they should be considered by a board of arbitration selected by the Public Service Commission of Indiana. Fourteen cars were in operation on the South Bend city lines on April 30, and the interurban service was still uninterrupted. A mass meeting and parade of all the labor unions was held on the night of May 1 in an effort to secure public sympathy in the strike.

Washington Inquiry Started

Senate Appoints a Committee to Inquire Into Recent Strike—Company's Brief Submitted

The machinery of the United States Senate committee which will inquire into the strike of the employees of the Washington Railway & Electric Company has been set in motion. The committee is composed of five Senators. They are Messrs. Hughes, Pittman, King, Jones, and Johnson of California. Mr. Hughes is chairman. While the committee organized on April 22 the pressure of the other duties of the Senators in connection with the vast war work under way in Washington tended to delay materially the progress of the inquiry.

The company was quick to respond to the summons of the committee. It filed with that body on April 30 a general and sweeping denial of the alleged facts in the complaint of the strikers. The company denied that it was guilty of bad faith in submitting an individual contract to its employees. It also denied that it was trying to break up the organization of the employees, and that it secretly imported strike breakers while appearing to be willing to discuss a new agreement with the men. The reply went at length into the history of the company. According to the company dissatisfaction among the employees followed the formation of the local division of the Amalgamated Association. It is pointed out that the strike of 1916 was settled through negotiations between the company and a committee representing all employees and not merely union men. That the company refused to deal with the union was reiterated.

A brief in rebuttal to that filed by the company, it is expected, will be filed within a few days by James H. Vahey, counsel of the Amalgamated Association. As soon as the answer is received by the committee arrangements will be made for hearing the arguments.

Although the cases of the fifteen strikers charged with wrecking a car of the Anacostia line last month are still pending in Police Court, it is not expected they will be heard there. It is believed the grand jury will investigate the charge.

Obstructionist in Cincinnati

Injunction Sought to Prevent Issue of $6,000,000 of Bonds for Rapid Transit Construction

On April 26 Davis S. Oliver, acting as a taxpayer, amended his petition filed in Common Pleas Court in Cincinnati, Ohio, on March 31, and now seeks an injunction against the issuance of $6,000,000 of bonds or any part of the sum for the construction of the rapid-transit loop, and against the entering into any contracts for the construction of the loop under the terms of the ordinance passed by the Council and approved by the voters. The Cincinnati Street Railway, the Cincinnati Traction Company and the Ohio Traction Company are made party defendants with the city and the Rapid Transit Commission in the amended petition. Mr. Oliver argues that any agreement in accordance with the terms of the ordinance will result in the misapplication of the city's funds and the abuse of corporate power. He further claims that the law under which the ordinance was passed is unconstitutional.

It is possible that no street railway commissioner will be appointed until January, 1918, and the Council may not take action for some time yet in regard to salaries for the members of the Rapid Transit Commission, as provided by a law enacted last winter. Until bonds are sold, no funds will be available for this purpose. The members of the commission will in all probability manage the preliminaries through the remainder of this year without the aid of a street railway commissioner. Chief Engineer Krug estimates that the $40,000 remaining of the original appropriation of $100,000 will be sufficient to pay the engineering expenses for this year. The Council will undertake no legislation until requested to do so by the Rapid Transit Commission or the Mayor. A question has been raised as to just when the ordinance takes effect, but the consensus of opinion seems to be that it became effective when approved by the voters.

Mr. Reynolds' Memory Honored

New England Street Railway Club and Massachusetts Street Railway Association Pay Tribute to Deceased Bay State Official

A most unusual tribute to the memory of a street railway man occurred at the Hotel Somerset, Boston, on the evening of April 26, when members of the New England Street Railway Club and the Massachusetts Street Railway Association assembled in joint meeting in commemoration of Henry E. Reynolds, assistant general manager of the Bay State Street Railway, who died last month. About 200 members attended. Testimony to Mr. Reynolds' sterling worth, ability and capacity for friendship was borne by Clark V. Wood, president of the Springfield (Mass.) Street Railway; Matthew C. Brush, president of the Boston Elevated Railway; Robert S. Goff, vice-president and general manager of the Bay State Street Railway; Bentley W. Warren, counsel for the Massachusetts Street Railway Association, and P. F. Sullivan, president of the Bay State Street Railway. Appropriate resolutions taking Mr. Reynolds' life as an inspiration for future co-operation among workers in the street railway industry in New England were presented by a committee consisting of C. S. Clark, A. E. Potter and E. C. Foster. These embodied the expression of the ideals of a life of service and were unanimously adopted. The meeting was the first joint gathering in the history of the two organizations.

M. M. and M. C. B. Convention Abandoned

At a meeting on April 30 the officers of the American Master Mechanics' and Master Car Builders' Associations decided not to hold any convention this year. The abandonment of the exhibit feature was mentioned in the issue of this paper for April 21.

Bay Region Labor Troubles

An arbitration of the Key Route strike, as reported on page 761 of the ELECTRIC RAILWAY JOURNAL for April 21, resulted in allowing the men the hour schedule which they had demanded and which calls for twelve hours on and twenty-four hours off. This will increase the company's cost of operation about $40,000 annually, and to cover this increase the company is applying to the State Railroad Commission for permission to increase fares.

Later the engineers and deck officers of the ferryboats operated on San Francisco Bay by the Northwestern Pacific Railway and the Southern Pacific Railway demanded the same working hours that have been granted Key Route employees. No agreement between companies and employees could be reached on this score and the men announced that they would resign in a body at the close of business on Saturday night, April 28. Both railways therefore announced that the regular ferry service would be discontinued beginning Sunday morning. This threatened strike was averted at the last moment, however, by allowing the demands for twelve hours on and twenty-four hours off.

Coal a Problem in Cleveland

Cost of Fuel to Cleveland Railway $50,000 a Month More Than Formerly

Through Street Railway Commissioner Fielder Sanders, President J. J. Stanley of the Cleveland (Ohio) Railway presented a communication to the City Council on April 30 in which he called attention to the fact that the company's coal contracts had expired and that monthly contracts had been made at the best prices obtainable. Coal will cost the company practically $50,000 more a month than in the past and it will be necessary to increase the operating allowance sufficiently to cover this amount. Mr. Stanley estimated this increase at 1.16 cents per car-mile. It is not known just what the company is paying per ton for fuel on its temporary contracts.

Rumored Deal for Leavenworth-Topeka Line.—It is reported that Eastern capitalists are planning to take over the Leavenworth & Topeka Railway, the 47-mile steam line between Leavenworth and Topeka, Kan., which at various times has been reported about to be electrified. The line was operated by the Union Pacific and the Santa Fe, but is now in receivers' hands.

Increase in Pay on Inland Empire System.—E. E. Lillie, superintendent of the Spokane (Wash.) Traction Company, which is controlled by the Spokane & Inland Empire Railroad, recently announced that conductors and motormen of the Inland Empire system, including the city lines of the company, will receive an increase in pay. The amount of the raise will not be made public, however, until accountants, who now are at work, have submitted a report.

More Men Needed in Cleveland.—Fielder Sanders, street railway commissioner of Cleveland, Ohio, stated on April 19 that a number of cars had been taken off the lines on the east side of the city during the evening rush because men could not be secured to operate them. Mr. Sanders estimated that 150 additional men were needed, but Paul Wilson, secretary to President J. J. Stanley of the railway, said that the service could be greatly improved with the addition of fifty men.

Openings with Public Service Commission.—The Civil Service Commission of the State of New York has issued a circular describing examinations which will be held on June 2 for various positions on the Public Service Commission and other State departments. These include a junior electrical engineer for the Public Service Commission, First District, salary $901 to $1,200 a year, a special track work draftsman for the same commission, salary $1,501 to $1,800 a year, and a statistician in the State Department of Labor, salary $1,200 to $1,560 a year.

Increase in Wages in Spokane.—A material increase in the pay of trainmen of the city and interurban system has been authorized by the Washington Water Power Company, Spokane, Wash. The increase ranges from 2 to 6 cents an hour. It provides that men on the city system receive 28 cents an hour for the first six-month period, 29 cents for the second six months, 30 cents for the third six months, and 31 cents for the fourth six months. From that time to the twelfth year they receive 32 cents; for the thirteenth, fourteenth and fifteenth years, 33 cents, and after fifteen years, 35 cents.

Attorneys to Confer at Toledo.—It was announced on April 30 that D. C. Bailey, attorney for H. L. Doherty & Company, would be in Toledo during the week commencing April 30 to confer with the attorneys of the Toledo Street Railway Commission in regard to the wording of certain clauses in the community plan ordinance. At the last conference between members of the commission and Mr. Doherty the language of these clauses was left to Attorneys Johnson Thurston and Ralph Emery to arrange. Mr. Doherty later wrote that the forms suggested did not seem to cover the agreements reached.

Wage Negotiations at East St. Louis.—Negotiations are being conducted between the East St. Louis & Suburban Railway, East St. Louis, Ill., and its trainmen over the working conditions of a new contract to take the place of one which expired on May 1. The company says frankly that under present conditions it is unable to make an increase in wages sufficient to equal the increased cost of living, but has offered a considerable increase, as well as a bonus for any reduction made in the accident account over the average percentage for the four years ended June 30, 1916. It is expected that an agreement will be reached.

Motor Buses Proposed for Chicago.—The Chicago Stage Company, an Illinois corporation, backed by the New York Transportation Company, which owns the Fifth Avenue Coach Company, has made application to the Chicago authorities for about 60 miles of motor-bus routes over the boulevards and park systems there. The officers of the Chicago company are Richard W. Meade, president; Samuel E. Morrow, secretary, and George L. Willems, treasurer. These gentlemen occupy similar positions with the New York Transportation Company. In making application in Chicago the company has specified a 10-cent fare, has asked for a twenty-year franchise, and has agreed to guarantee minimum payments to the municipal authorities of more than $2,700,000. This is along the lines of the recent proposals made by the Fifth Avenue Coach Company for additional routes in New York City.

Rhode Island Committee Organized.—Zenas W. Bliss, chairman of the Rhode Island Tax Commission, has been made chairman of the special committee created by the General Assembly to investigate the affairs of the Rhode Island Company and offer financial assistance in the way of fare changes, if such changes are found to be just. The commission has notified the Rhode Island Company of its organization, and has requested the assignment of a date for a preliminary meeting, to map out the work. The other commissioners are William C. Bliss of the Public Utilities Commission and George H. Newhall, Bank Commissioner.

Toronto Men Request Wage Increase.—At a meeting of the Toronto (Ont.) Railway employees on April 28, it was decided to make a demand upon the company for an increase in wages of 10 cents an hour all around. The present agreement expires on June 15. Under the new schedule, a sliding scale, the union will ask for an increase from 26 to 36 cents an hour for the first year; 28 to 38 cents for the second year, and from 30 to 40 cents for the third year and thereafter. The men will urge a more uniform system of working hours, and they will also ask for a revision of several other clauses in the present working agreement.

Sympathy Strike in New Orleans Plants.—The employees of the power stations of the New Orleans Railway & Light Company, New Orleans, La., went on strike recently and hampered the company considerably for a time in rendering continuous service. The men aligned themselves in sympathy with their chief, Edward B. McKinney, superintendent of power of the company, in a personal controversy between him and the management, but returned to work after the issues in dispute had been explained to them at length by the company. Mr. McKinney has since been succeeded in his position by J. J. Chisholm, formerly superintendent of power of the Tennessee Coal & Iron Company, Birmingham, Ala.

Service Restored in Lincoln.—Conditions were practically normal again on April 30 with the Lincoln (Neb.) Traction Company, the trainmen of which went on strike on April 18. The company succeeded in operating about 55 per cent of its equipment the first day of the strike and has bettered this mark every day since then. By April 30 the full schedule had been established for daylight service. Since the third night of the strike there has also been a limited service after dark. New men are being recruited rapidly and the company expected to return to the normal eighteen-hour service by the latter part of the week ended May 5. The company is determined in its course not to recognize any union, and no union employees will be allowed to remain in its employ.

West Side Measure Passed.—The Green bill providing for an investigation of the proposed west side improvement contract between New York City and the New York Central Railroad, has been passed by the Assemby. The Green measure and another bill drafted by the Public Service Commission have been agreed upon as a solution of the west side problem. The Green bill provides for a commission of seven members to report its findings to the Legislature by Feb. 1, 1918. The Public Service Commission bill provides for concurrent action on the contract by the Board of Estimate and the Public Service Commission, and authorizes the commission to compel the railroad to execute its improvement plans in case an agreement is not reached with the city by Dec. 1, 1917.

Trains of Steel and Wood Cars Opposed.—The danger of using wood trail cars between steel motor cars was emphasized recently in a report made by Clifton W. Wilder, electrical engineer of the Public Service Commission for the First District of New York, at a hearing held by the commission in regard to the joint operation on the Rockaway Beach line via Chestnut Street junction by the Long Island Railroad and the New York Consolidated Railroad. The question before the commission is whether or not the proposed equipment to be used on the line "will be unsafe, improper or inadequate." The Long Island Railroad stated to the commission that the maximum service on Sunday would require it to furnish as its proportion of the equipment twenty trail and forty motor cars. The company has no wood motor cars and steel trail cars available. Mr. Wilder's opinion is that the operation of mixed wood and steel cars is extremely dangerous and offers a serious fire hazard.

Suit brought in Seattle Case.—The city of Seattle, Wash., has brought suit in the King County Superior Court against the Puget Sound Traction, Light & Power Company to recover $64,387, representing 2 per cent of the gross earnings of the street railway system during 1916. This matter, as well as the paving of rights-of-way, has been before the courts for approximately two years, ever since the company appealed to the Public Service Commission to be relieved of certain of its franchise obligations. The Public Service Commission has not yet acted upon the petition, and since then the company has paid the gross earnings tax under protest, and has planked rights-of-way instead of paving them. On Jan. 15 last the company tendered the city of Seattle a check for $64,387, to be considered as paid under protest, with the further stipulation that the check was to be returned unless the city abandoned its plan to bring suit against the company to enforce that provision in the street railway franchises requiring the company to pave rights-of-way with the same material and at the same time as the remainder of the street is paved. The Council directed that the check be returned, and the suit to enforce the paving obligation was brought before the Superior Court.

Programs of Association Meetings

Arkansas Association of Public Utility Operators

The tenth annual convention of the Arkansas Association of Public Utility Operators will be held in Pine Bluff, Ark., on May 16, 17 and 18. The program of papers is now being completed.

American Railway Association

In view of the present national crisis and the earnest desire of the railroads to render the greatest service and to co-operate heartily with the government in the conduct of the war, the executive committee of the American Railway Association has postponed indefinitely the spring session of the association, which was to have been held on May 16.

Pennsylvania Street Railway Association

The executive committee of the Pennsylvania Street Railway Association has resolved that because of the war there will be only a one-day meeting of the association at this time. It will be held on May 11 at the Harrisburg Club, Harrisburg, beginning at 11 o'clock. Luncheon will be served at 2 o'clock and instead of a set program, after routine business of the association, the following "war time policies" will be discussed in an informal way:

1. In what specific ways can the street railway interests of Pennsylvania best serve the State and the nation? (a) as companies, (b) as individuals?

2. What policies have been adopted relative to (a) protection of power plants, bridges and other property? (b) registering of employees as to nationality and loyalty? (c) contributions to dependents of employees called to active service? (d) transportation of troops and filing of tariffs in connection with same? (e) transportation of individual soldiers and sailors in uniform? (f) possibilities of employing women in train service? (g) carrying posters in and on cars to encourage enlistment?

The subject "War Time Economies" will also be discussed. The object will be to secure suggestions as to practical methods of meeting present material and labor conditions, such as substitution of materials, operating economies, etc.

Financial and Corporate

Annual Report

Cleveland Railway

The income statement of the Cleveland (Ohio) Railway for the year ended Dec. 31, 1916, follows:

I.—BASED ON ORDINANCE ALLOWANCES

		Cents per Car-Mile
Operating revenues:		
Revenue from transportation	$9,428,091	....
Revenue from other operations	93,464	....
Total operating revenues	$9,521,555	28.11
Expense allowances:		
Maintenance	$1,673,548	4.94
Operating	4,492,732	13.27
Total expense allowances	$6,166,280	18.21
Net operating revenue	$3,355,275	9.90
Non-operating income	75,750	0.22
Gross income	$3,431,025	10.12
Taxes	579,423	1.71
Net income	$2,851,602	8.41
Interest	1,912,815	5.65
Surplus	$938,787	2.76
Special allowances	936,000	2.76
Net surplus	$2,787	....

II.—BASED ON ACTUAL EXPENSES

Operating revenues	$9,521,555	28.11
Actual expenses:		
Maintenance of way and structures	$1,062,379	3.14
Maintenance of equipment except power plant	808,060	2.38
Maintenance of power plant	49,254	0.15
Total maintenance	$1,919,693	5.67
Power	$811,594	2.40
Conducting transportation	2,824,852	8.34
Traffic	500	....
General and miscellaneous	1,103,793	3.26
Total operating	$4,740,739	14.00
Total expenses	$6,660,433	19.67
Net operating revenue	$2,861,122	8.44
Non-operating income	75,751	0.22
Gross income	$2,936,873	8.66
Taxes	579,423	1.71
Net income	$2,357,450	6.95
Interest	1,912,815	5.65
Surplus	$444,635	1.30
Obsolete property	384,000	1.13
Net surplus	$60,635	0.17

The increase in gross receipts in 1916 over 1915 amounted to $1,054,993 or 12.35 per cent. This gain was made up as follows: Revenue from transportation, 12.42 per cent; revenue from other operations, 14.43 per cent, and non-operating income, 2.60 per cent. The passenger revenue increased 12.53 per cent to $9,289,899; the chartered-car revenue, 6.92 per cent to $10,119; the express revenue, 24.01 per cent to $43,357, and the milk revenue, 15.23 per cent to $17,772. Other transportation revenues showed decreases.

The increase in receipts per car-mile during 1916 was 7½ per cent. This increase was not due to an increase in rate of fare or in rate of speed, but to the fact that the percentage of increase in the number of passengers was greater than in the number of car-miles. The increase in service, measured in car-miles, was but 4½ per cent. The increase in the number of rides was more than 12½ per cent.

The rate of fare in effect in both years was rate "e" of the Tayler franchise, "3 cents cash fare, 1 cent transfer, no rebate." The 5-cent fares to some of the suburbs — Lakewood, Cleveland Heights and others — brought the average fare per passenger to 3.417 cents. The ratio of transfers to fares in 1914 was 40 per cent, in 1915 it was 37½ per cent, and in 1916 it was 37.12 per cent. The maximum fare permitted by the Tayler franchise is "4 cents cash fare, seven tickets for 25 cents, 1 cent transfer, no rebate." If this maximum rate should come into effect, and if the ratio of transfers to fares should then be the same as it was in 1916, the average fare would be about 4 cents. The difference, therefore, between the maximum rate and the present rate is 0.583 cent, which is 17 per cent more than the present rate.

In discussing service, the annual report states that the present schedules on nearly all the lines require the operation during the evening rush hours of many more cars than twice the number operated per hour on the base table, and, under a franchise provision, the company is entitled to, and expects to ask, an additional allowance for operating expenses. The allowance, however, if made by the Council or awarded by arbitration, will not affect the actual cost of operation or increase the company's earnings either in gross or per car-mile. An increase in the allowance, however, it is said, will probably necessitate an increase in the rate of fare.

The franchise thus furnishes reasons that should appeal to the city to co-operate with the company to bring about more economical operation by inducing passengers to vary their times of travel.

The expenditures in 1916 for injuries and damages amounted to $570,856, an increase of $195,151 over the expenditures of 1915. The price of injuries has increased at equal pace with the prices of labor and commodities. It is estimated that it will cost about $400,000 to adjust and settle all pending suits and claims for damages. The taxes of 1916 were 18.72 per cent higher than those of 1915. The increase was due largely to the fact that the State Tax Commission fixed a higher valuation by $2,749,920 than was fixed for 1915. The tax rate in 1915 was $1.53, and in 1916 it was $1.55. The betterment expenditures in 1916 totaled $858,434.

On Dec. 31, 1916, there was a balance of $545,438 in the interest fund, or $45,438 more than the amount placed in the fund originally under the provisions of the Tayler ordinance. This is accounted for as follows: Profits (earnings in excess of allowances, taxes and interest) in 1910, 1912, 1915 and 1916, $463,173; losses (allowances, taxes and interest in excess of earnings) in 1911, 1913 and 1914, $417,735; net increase in fund, $45,438.

The general relation between results in the last two years is shown by the following percentages of increase for 1916:

	Per Cent		Per Cent
Passenger revenue (exclusive of transfers)	12.60	Total expenses, taxes and interest	12.62
Passenger revenue (including transfers)	12.53	Fares	13.12
Gross income	12.35	Transfers	11.90
Maintenance allowance	4.29	Rides	12.57
Maintenance expenses	12.41	Ordinance car-miles	4.45
Operating allowance	11.34	Actual car-miles	4.50
Operating expenses	16.34	Allowances, taxes and interest	16.04
Taxes	18.72	Expenses, obsolete equipment, taxes and interest	14.40
Interest	3.03		
Operating expenses, taxes and interest	12.67		

Electric Railway Earnings

Two Hundred and Ninety-four Companies Gain 9.65 Per Cent in Gross and 9.18 Per Cent in Net During 1916

The annual compilation of the gross and the net earnings of electric railways in the United States made by *The Commercial & Financial Chronicle* shows, it is said, that the influence of jitney competition as a disturbing factor has in a large measure passed away. For the calendar year 1916 the electric carriers again displayed their former characteristics and registered "the normal rate of progress which seems to be the law of their existence."

The gross earnings for 294 electric railways in 1916 were $582,697,750, an increase over 1915 of $51,272,132 or 9.65 per cent. The net earnings for the same roads in 1916 were $219,236,230, an increase of $18,444,332 or 9.18 per cent. The activity in trade and business had some influence in bringing about this improvement, but not such a tremendously important influence as in the case of the steam railroads.

Without doubt, it is said, the effect of business activity in 1916 would have been more marked in the case of the electric lines if it had not been for severe strikes in New York City. These served to reduce heavily the earnings of the metropolitan traction lines. Local traction troubles at one or two other points had a similar effect in reducing revenues, both gross and net.

Not all of the separate roads included in the compilation shared in the improvement. Altogether, out of the 294 roads, forty-three showed a decrease in gross earnings and eighty a decrease in net earnings. The compilation is made up in considerable part of street railways, but the table includes many other electric lines in suburbs and also numerous interurban electric railways of large magnitude.

Besides the companies that furnished returns of both gross and net earnings, nine other lines gave figures of gross alone. For the total of 303 lines the gross earnings amounted to $584,864,779 in 1916, an increase of $51,280,442 or 9.61 per cent. By applying to these nine roads the same operating ratios for 1916 and 1915 as were found in the case of the large number of companies furnishing full reports, it was calculated that the aggregate net for the whole 303 roads reached $220,587,618 in 1916, an increase of $18,452,949 or 9.13 per cent.

By adding the returns of fifty-seven companies which reported for the fiscal year ended June 30, 1916, it was possible to get a general aggregate for 360 electric railways. The total of the gross earnings for the last year was $626,840,449, an increase of $52,457,550 or 9.13 per cent. The aggregate net earnings were $234,402,450, an increase of $18,484,877 or 8.56 per cent.

The minor railways not represented in the compilation, it is stated, would not swell the total to any great extent, but a few large companies are missing. Among these may be mentioned the Denver Tramway System, the Toledo Railways & Light Company and the Wilkes-Barre Railway. Many of the railways furnish electricity for lighting and power purposes, but in a number of cases only the income derived from the street railway departments of the company was included in the table.

The comparative totals of gross and net since 1905 are shown in the following table:

GROSS EARNINGS

Period	Current Year	Previous Year	Increase	Per Cent
1905 compared with 1904..	$306,067,145	$281,608,936	$24,458,209	8.68
1906 compared with 1905..	300,567,453	269,595,551	30,971,902	11.49
1907 compared with 1906..	306,266,315	280,139,044	26,127,271	9.33
1908 compared with 1907..	351,402,164	348,137,240	3,264,924	0.94
1909 compared with 1908..	374,305,027	345,006,370	29,298,657	7.49
1910 compared with 1909..	435,461,232	405,010,045	30,451,187	7.51
1911 compared with 1910..	455,746,306	428,631,259	27,115,047	6.33
1912 compared with 1911..	486,225,094	457,146,070	29,079,024	6.36
1913 compared with 1912..	529,997,522	500,252,430	29,745,092	5.94
1914 compared with 1913..	553,095,464	548,296,520	4,798,944	0.87
1915 compared with 1914..	567,901,652	569,471,260	*1,569,608	*0.28
1916 compared with 1915..	626,840,449	574,382,899	52,457,550	9.13

NET EARNINGS

Period	Current Year	Previous Year	Increase	Per Cent
1905 compared with 1904..	$130,884,923	$118,221,741	$12,663,182	10.71
1906 compared with 1905..	126,580,195	114,024,076	12,556,119	11.01
1907 compared with 1906..	126,002,304	121,050,703	4,951,601	4.09
1908 compared with 1907..	142,262,417	141,144,213	1,118,204	0.79
1909 compared with 1908..	160,394,765	140,647,906	19,746,859	14.03
1910 compared with 1909..	178,037,379	167,100,351	10,937,028	6.54
1911 compared with 1910..	186,001,439	175,527,542	10,473,897	5.96
1912 compared with 1911..	194,309,873	179,915,760	14,394,113	8.00
1913 compared with 1912..	204,422,429	193,393,045	11,029,384	5.70
1914 compared with 1913..	211,020,088	212,146,403	*1,126,315	*0.53
1915 compared with 1914..	214,319,303	217,440,533	*3,121,230	*1.43
1916 compared with 1915..	234,402,450	215,917,573	18,484,877	8.56

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*Decrease.

Connecticut Recognizes Utility Bonds

The Governor of Connecticut has signed the amendment to the banking law of that State that has just been passed by the Legislature widening the scope of investments which are legal for savings banks to purchase. The investments so sanctioned include bonds of certain gas, electric, water and telephone companies of the New England States and New York to the amount of 2 per cent of the deposits and surplus of the banks. As noted in the ELECTRIC RAILWAY JOURNAL of April 14, page 708, the State of Maine recently passed a bill amending the savings bank law there so as to include certain bonds of public utility corporations not heretofore recognized as legal for investment in that State.

Shore Line Program Approved

Amendments to the Charter Desired by the Company Are Passed

The amendment to the charter of the Shore Line Electric Railway, Norwich, Conn., has passed both houses of the General Assembly of Connecticut in somewhat different form than originally presented, but the company has accomplished all that it desired to accomplish. It has secured the right to sell power to all public utility corporations doing business in its territory and to increase its capitalization as required, and has also obtained confirmation of the consolidation of its various properties. In addition to this program the company asked the Assembly to dissolve by legislative enactment the three companies that it absorbed on Nov. 1. This was denied as a legislative measure, but will be accomplished through dissolution in the ordinary way, by vote of the stockholders and public notices in the papers. Legislative dissolution would have relieved the company of these details.

A charter has also been secured for the Shore Line Electric Railway in Rhode Island, with the same stockholders as in Connecticut, absorbing, in this way, all the rights possessed by the Pawcatuck Valley Street Railway, Ashaway & Westerly Railway and the Westerly & Connecticut Railway. These were all owned until recently by the Norwich & Westerly Traction Company. This form of duplicate incorporation in two States is somewhat unusual. The New York, New Haven & Hartford Railroad was the first to secure this right. The Norwich & Westerly Traction Company then secured a similar charter and now the Shore Line Electric Railway is permitted the same privilege and absorbs the rights of the Norwich & Westerly Traction Company.

The program of the company for the accomplishment of the purposes mentioned was referred to briefly in the ELECTRIC RAILWAY JOURNAL of Feb. 10, page 268.

Additional Financing Proposed

American Water Works & Electric Company Proposes to Wipe Out Accumulated Dividends and Provide for Future

A circular has been issued to holders of voting trust certificates of the American Water Works & Electric Company, Inc., New York, N. Y., outlining a plan calling for an increase in the company's preferred stock from $5,000,000 to $10,000,000. Of such increase $450,000 is to be issued at once to meet a part of the 21 per cent, or $1,050,000, of dividends now in arrears on the issue. The remainder of the authorized increase of $4,550,000 is to be issued from time to time to provide for improvement, betterments, etc., and to supply capital for enlarging activities of the company and for corporate purposes. If the plan is consummated, the directors believe that the company may safely begin paying in cash the current dividend on the first preferred stock. The plan provides that the dividend shall be liquidated as follows: $150,000 or 3 per cent, in cash forthwith; $450,000 or 9 per cent, in first preferred stock at par, and $450,000 or 9 per cent, in common stock at 22½, or $2,000,000 par value of common stock. On this basis the holder of $10,000 of first preferred stock, upon which there is due $2,100 accumulated dividends, will receive $300 in cash, $900 par value first preferred stock at par and $4,000 par value common stock at $22, or $900, making a total of $2,100.

Among the companies which the American Water Works & Electric Company controls are the West Penn Railways, the West Penn Traction Company and the West Penn Traction & Water Power Company.

Bay State Street Railway, Boston, Mass.—The Massachusetts Public Service Commission has authorized the Bay State Street Railway to issue $489,000 of first preferred stock at $100 a share, $325,000 of Boston & Northern Street Railway fifty-year 4 per cent bonds and $398,000 of Old Colony Street Railway bonds, the proceeds to be used to pay floating debt and for construction and equipment.

Boston (Mass.) Elevated Railway.—The directors of the Boston Elevated Railway have declared a quarterly dividend of 50 cents a share, payable on May 15 to stock of record of May 2. This makes $5 per share declared for the fiscal year ending June 30.

Boston & Worcester Street Railway, Boston, Mass.—The Boston & Worcester Street Railway has applied to the Massachusetts Public Service Commission for authority to issue $270,000 of additional preferred stock and $40,000 of additional first mortgage bonds, which will make $667,000 of stock and $2,440,000 of bonds outstanding respectively.

Brazilian Traction, Light & Power Company, Toronto, Ont.—Alexander Mackenzie, president of the Brazilian Traction, Light & Power Company, has issued a statement in regard to the proposed suspension of dividends on the ordinary stock. In concluding this statement Mr. Mackenzie said: "Owing to the abnormal conditions arising from the war it has been necessary to meet capital requirements, so far as has not been paid out of earnings, by temporary loans, with the result that the floating debt of the company and its subsidiaries on March 31 amounted to $4,850,000. Dividends on the preferred shares call for $600,000 yearly, and on the ordinary shares at 4 per cent per annum call for $4,250,000, making a total of $4,850,000, which sum deducted from the estimated net revenue, leaves only a relatively small balance available for capital expenditure and floating debt. The board has, therefore, decided not to pay a dividend in June next and proposes to continue this policy throughout the year, unless there should be such improvement in foreign exchange to justify the resumption of the dividend at an earlier date."

Caldwell (Idaho) Traction Company.—Walter R. Sebree, president of the Caldwell Traction Company, reports that his company is planning to issue $100,000 of bonds to provide funds to electrify its Wilder branch, now operated by steam, and to extend the present lines. The bonds are to run for ten years at 6 per cent interest. The trustee of the issue will be the Tracy Loan & Trust Company, Salt Lake City, Utah. All the stock of the Caldwell Traction Company is in the hands of the Sebree family. The property is at present free from bonded indebtedness.

Cleveland (Ohio) Railway.—The statement of operation of the Cleveland (Ohio) Railway for March shows an increase in the interest fund from $434,744 to $445,959. After making several payments, in accordance with agreements and findings, the accumulated deficit was $1,063,098, not including any allowance for the old Cedar Avenue power house. The ordinance allowance for maintenance was $118,029, and for operation, $427,856, a total of $545,886, while the actual expenditures were $545,143, leaving a balance of $742. For the month the total number of rides was 33,779,647, an increase of 10.01 per cent over last year. The number of fares was 24,747,216, an increase of 10.04 per cent. Transfers increased 6.04 per cent over the same month in 1916.

Columbus, Delaware & Marion Railway, Cincinnati, Ohio.—The sale of the Columbus, Delaware & Marion Railway has been ordered by Judge Kinkead in the Common Pleas Court following an agreement between counsel for the sale to be subject to mortgages held by the Guaranty Trust Company, New York, and the Cleveland Trust Company, Cleveland, Ohio. The receiver of the company had paid all interest charges up to last November. The demand for improvements in 1916, however, caused the expenditure of all surplus earnings, and no money was available to meet the interest due in November on the first mortgage. Later the receiver was ordered by the court not to pay interest on the second mortgage bonds of the company due on Feb. 1.

Empire United Railways, Inc., Syracuse, N. Y.—Interest on the Syracuse, Lake Shore & Northern Railroad and the Auburn & Northern Electric Railroad bonds will be paid on May 1 under a ruling by Supreme Court Justice Hubbs, directing receivers H. S. Holden and C. L. Allen to make the payment of about $68,500. At the same time the court directed the receivers under the Syracuse, Lake Shore & Northern Railroad foreclosure action, which was abandoned when the Ford, Bacon & Davis reorganization plan was adopted, to turn over to themselves as receivers $76,726, which had accumulated under the Lake Shore receivership. The May 1 interest will be paid from the proceeds of this fund.

Grand River Valley Railway, Grand Junction, Col.—A. E. Carlton, vice-president of the Grand River Valley Railway, Grand Junction, Col., which also does lighting in Grand Junction and Fruita, in conjunction with his associates purchased the property of the Colorado Midland Railroad, a steam line, under foreclosure at public auction on April 21. According to the Denver *News* the new owners propose to make the Grand River Valley Railway, which is operated by electricity, a part of the Colorado Midland system.

Long Island Railroad, New York, N. Y.—The plans of the Long Island and the Pennsylvania Railroads for the readjustment of their financial relations to relieve the Long Island of some $700,000 a year interest charges, and to give the Pennsylvania ownership of all of the Long Island stock has received tentative approval from the Public Service Commission for the Second District of New York. Under the proposal which now awaits only the formal approval of the commission, the Long Island Railroad will issue about $22,000,000 of common stock and $5,202,100 of 5 per cent debenture bonds. The stock will be acquired by the Pennsylvania Railroad and used to cancel a like amount of Long Island bonds held by the Pennsylvania Railroad upon which the Long Island now pays 4 per cent a year. The minority stockholders of the Long Island Railroad will receive the 5 per cent debentures in exchange at par for their holdings which will pass to the Pennsylvania Railroad.

Northern States Power Company, Chicago, Ill.—An offering of $1,500,000 of new 7 per cent preferred stock, at par and accrued dividends, is being made to the shareholders of Northern States Power Company, nearly 3000 of whom reside in the territory served by the company in Minnesota and adjoining states. Any part of the issue which may not be taken by stockholders will be purchased by a syndicate composed of H. M. Byllesby & Company, William P. Bonbright & Company and Spencer Trask & Company. Proceeds of the stock will be used to acquire additional distribution centers, enlarge property and extend transmission lines.

Orleans-Kenner Electric Railway, New Orleans, La.—It is understood now that before the negotiations are concluded looking toward the control of the Orleans-Kenner Electric Railway passing to the New Orleans Railway & Light Company the residents of Jefferson Parish will have an opportunity to liquidate the indebtedness of the company to Bertron, Griscom & Company. This decision was reached at a meeting at which Harry K. Johnson, promoter of the Orleans-Kenner Electric Railway, explained the matter to the residents of the territory served by the company. Mr. Johnson reiterated very largely the statement made by Francis T. Homer, of Bertron, Griscom & Company, referred to in the ELECTRIC RAILWAY JOURNAL for April 28, page 799. Mr. Johnson said: "This road owes Bertron, Griscom & Company, who own the controlling interest in the New Orleans Railway & Light Company, about $170,000. To secure this loan, we have pledged to them 51 per cent of our capital stock and a majority of our bonds. We have got to repay the loan, and we have been unable to finance the road, except through delivery of the control to Bertron, Griscom & Company."

United National Utilities Company, Philadelphia, Pa.—The Utilities Service Corporation, Philadelphia, Pa., is offering for subscription at $100 per share with 50 per cent of common stock as a bonus the unsold balance of $2,500,000 of 6 per cent cumulative preferred stock of the United National Utilities Company. The United National Utilities Company among other properties controls the American Railways and the Jersey Central Traction Company and affiliated lighting companies.

West Penn Railways, Pittsburgh, Pa.—The shareholders of the West Penn Railways and the West Penn Traction Company will vote on May 15 on a merger plan, the new company to be known as the West Penn Railways, with an authorized capital stock of $20,000,000, of which $10,000,000 will be common stock and $10,000,000 6 per cent cumulative preferred stock, preferred both as to dividends and assets and redeemable at 105. Of the stock so authorized $7,365,406 of the preferred and $8,044,700 of common will be issued, and the remainder reserved for future purposes.

West Virginia Traction & Electric Company, Wheeling, W. Va.—William P. Bonbright & Company, Inc., New York, N. Y., have underwritten $1,800,000 of 6 per cent secured notes of a new authorized issue of $2,000,000 of the West Virginia Traction & Electric Company. The proceeds will be used to retire the two-year 6 per cent collateral gold notes of the company, due on June 1, 1917. It is expected that a public offering of the notes will be made in the near future.

Dividends Declared

American Railways, Philadelphia, Pa., quarterly, 1¾ per cent, preferred.

Bangor Railway & Electric Company, Bangor, Me., quarterly, one-half of 1 per cent, common.

Bristol & Plainville Tramway, Bristol, Conn., quarterly, 2 per cent.

Connecticut Railway & Lighting Company, Bridgeport, Conn., quarterly, 1 per cent, preferred; quarterly, 1 per cent, common.

East St. Louis & Suburban Company, East St. Louis, Ill., quarterly, three-quarters of 1 per cent, preferred.

Illinois Traction Company, Champaign, Ill., quarterly, three-quarters of 1 per cent, common.

Electric Railway Monthly Earnings

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
ATLANTIC SHORE RAILWAY, SANFORD, ME.						
1m., Mar.,	'17	$25,739	*$23,449	$2,290	......	......
1 " "	'16	23,473	*22,283	1,190	......	......
CITIES SERVICE COMPANY, NEW YORK, N. Y.						
1m., Mar.,	17	$1,721,480	$31,312	$1,690,168	$225	$1,689,943
1 " "	'16	639,780	19,079	620,701	44,716	575,985
12 " "	'17	13,391,411	268,593	13,122,818	127,917	12,994,901
12 " "	'16	5,295,093	190,217	5,104,876	499,368	4,605,508
FEDERAL LIGHT & TRACTION COMPANY, NEW YORK, N. Y.						
1m., Mar.,	'17	$239,235	*$156,831	$82,404	$49,925	$32,479
1 " "	'16	216,914	*144,538	72,376	49,280	23,096
3 " "	'17	712,926	*455,341	257,585	148,861	108,724
3 " "	'16	658,614	*439,756	218,858	146,672	72,186
HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.						
1m., Mar.,	'17	$544,365	*$244,614	$299,751	$218,865	$80,886
1 " "	'16	510,203	*225,376	284,827	213,161	71,666
3 " "	'17	1,583,460	*710,273	873,187	651,299	221,888
3 " "	'16	1,478,022	*647,526	830,496	639,865	190,631
KANSAS CITY (MO.) RAILWAYS						
1m., Feb.,	'17	$564,260	*$380,509	$183,751	$131,159	††$39,805
1 " "	'16	545,435	*361,513	183,922	115,333	††43,078
8 " "	'17	4,917,264	*3,286,364	1,631,278	1,041,340	††309,515
8 " "	'16	**				
LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.						
1m., Mar.,	'17	$218,467	*$147,615	$70,852	$51,429	‡$31,128
1 " "	'16	192,104	*119,661	72,441	51,923	‡31,105
12 " "	'17	2,584,929	*1,655,329	929,600	626,387	‡452,457
12 " "	'16	2,205,377	*1,300,807	904,570	650,159	‡393,273
NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO						
1m., Mar.,	'17	$524,703	$324,501	$200,202	$78,751	$121,451
1 " "	'16	392,206	189,547	202,659	106,375	96,284
3 " "	'17	1,492,088	904,552	587,536	245,439	342,097
3 " "	'16	1,118,751	533,974	584,777	293,550	291,227
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.						
1m., Feb.,	'17	$158,578	*$96,565	$62,013	$29,114	$32,899
1 " "	'16	141,880	*88,509	53,371	28,725	24,646
12 " "	'17	1,967,490	*1,175,735	791,755	347,465	444,290
12 " "	'16	1,739,749	*1,070,285	669,464	334,159	335,305
REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO						
1m., Mar.,	'17	$376,822	*$245,765	$131,057	$78,347	‡$53,842
1 " "	'16	330,046	*198,688	131,358	65,995	‡67,385
12 " "	'17	4,143,045	*2,514,630	1,628,415	868,735	‡778,566
12 " "	'16	3,355,280	*1,982,024	1,373,256	717,657	‡662,127
TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.						
1m., Mar.,	'17	$916,605	$610,439	$306,166	$150,094	$156,072
1 " "	'16	850,282	542,924	307,358	145,586	161,772
3 " "	'17	2,641,912	1,799,459	842,453	435,069	407,384
3 " "	'16	2,490,985	1,609,174	881,811	427,882	453,929

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*Includes taxes. ††Includes addition of miscellaneous income and deduction of Kansas City surplus reinvested in plant. **During the fiscal year to Feb. 14, 1916, the property was operated by the receivers under the old securities, and the figures for this period, being without value in a comparative statement, are not shown here. ‡Includes non-operating income.

Traffic and Transportation

Employees War on Jitneys

Committee of Los Angeles Railway Employees' Co-operative Association Successfully Circulates Anti-Jitney Initiative Ordinance

Owing to the ineffectiveness of the present jitney ordinance, the Los Angeles (Cal.) Railway has prepared an initiative ordinance to be submitted to the voters of Los Angeles on June 5. The salient features of the proposed ordinance, in addition to the present license, the Board of Public Utilities control and $10,000 bond requirements, are that "each bus must be operated from 6 a. m. to 12 o'clock midnight" and that "no bus shall be operated in the congested district of the city."

This ordinance, an abstract of its main features and a statement of the attitude of the Los Angeles Railway employees, are being circulated for signatures on the initiative petition by a committee of 100 from the Co-operative Association of the Los Angeles Railway employees, assisted by all the wives of the members. These delegates on April 21 began a house-to-house canvass of the entire city. Although only 4800 bona-fide signatures of voters are required on an initiative petition, more than 10,000 signatures were obtained on the Saturday half-holiday, April 21, and on Monday, April 23. The delegates have met with the most encouraging reception everywhere. The abstract of the petition as circulated by the committee of employees read, in part, as follows:

THE MEN STATE THEIR POSITION

"Our whole body of men are feeling keenly the high cost of living, in common with the other wage earners of the country. We are, however, in the unfortunate position of having made application to our company for an increase of wages, but find it also is hard pressed to make both ends meet, owing to the unrestricted and unfair jitney competition.

"Our company pays annually to the State and to the city in the form of direct taxation and for paving and assessments practically $20 per seat of the maximum number of cars operated in the evening rush hour, while the jitneys pay about $3.50 per seat per annum, operate parallel to our lines, making the short runs and taking the straight 5-cent fares, absorbing the cream of the business and leaving the unprofitable portion for the company. Our hope is to restore the revenues of the company and thereby enable our employer to increase wages."

This initiative petition is the outgrowth of an employees' mass meeting called by the management to explain the financial status of the company. The men were so indignant at the unfair jitney competition that they wanted to make a direct appeal to the City Council; but after conference with the management the present plan of going to the voters with an initiative ordinance was adopted as more effective.

I. C. C. to Consider Freight Advance

The Interstate Commerce Commission has outlined its procedure in the hearing on the proposed 15 per cent increase in freight rates. The subject will be considered under seven heads, as follows:

The present emergency; war conditions; labor and wages; cost of fuel, material and supplies; recent changes in rates; the reasonableness of the proposed increased rates; and application to be made of the proposed increased revenue. Under the first head the commission will ask if an emergency affects all carriers alike, whether all require the same degree of relief, why that relief should take the form of a general percentage increase, and why the increase should be 15 per cent. The extent to which the Adamson law is responsible for the alleged emergency also is to be brought out.

Progress in Buffalo Survey

Construction of a Rapid Transit System and a Loading Terminal Are Recommended, Besides Several Rerouting Plans

The Chamber of Commerce of Buffalo, N. Y., is taking an unusual interest in the efforts of the two special traffic committees and the street railway officials to improve the local traffic conditions through the extensive survey now being made in that city. The International Railway has several rerouting plans under consideration. As soon as the Franklin Street franchise is approved by the Public Service Commission, tracks will be laid and many lines now using Main Street between The Terrace and Allen Street will use the Franklin Street line. Another plan calls for the removal from Washington Street of the cars of the heavily-patronized Broadway line, one of the largest traction arteries, to the east side. The special traffic committee of the Chamber of Commerce, which was appointed several months ago, has recommended the construction of a subway or an elevated system. M. S. Burns, chairman of the committee, did not indicate in his report which would be the better, but municipal authorities seem to favor the former.

Charles R. Barnes, electric railway inspector of the Public Service Commission for the Second District, who has been in Buffalo for two months investigating traffic conditions, will complete his report about June 1. R. G. Winans, assistant electric railway inspector, is aiding in the work, and several men in the employ of the railway are helping to make the traffic studies. Mr. Barnes is now investigating the present shortage of power.

Capt. George H. Norton, city engineer of Buffalo, has recommended the construction of a loading terminal on the site acquired by the company several years ago. At that time the company proposed to construct a large interurban terminal and office building on Pearl Street, in the heart of the downtown business section. Captain Norton has suggested that a loading terminal with separate tracks for the North Main Street, Riverside and West Side lines would facilitate the movement of traffic during the rush hours. He also favors the construction of a subway through the congested district.

Copper-Fare Zones Authorized

Small Massachusetts Road Will Charge 2 Cents per Mile, with a Minimum Rate of 6 Cents

The Public Service Commission of Massachusetts has granted to the Concord, Maynard & Hudson Street Railway, Maynard, Mass., a subsidiary of the Massachusetts Consolidated Railways, authority to establish a copper-zone system of fares on a 6-cent basis. The hearing was held on April 18. The case was the first the Massachusetts Commission has had which involved a copper-fare zone system proposed by a street railway. The company will charge 2 cents per mile for the distance actually traveled with a minimum charge of 6 cents. The road will be divided into 1-mile zones, indicated by mile posts, and a passenger may ride any distance within three consecutive zones for 6 cents with a charge of 2 cents for each additional mile or fraction thereof. The company proposed the new system in order to meet increasing operating expenses, chief of which is for coal, which now costs $10.50 per ton as compared with $3.50 per ton in 1914. Quotations for future deliveries promise no relief.

The company's line is 18 miles long and runs from Concord Center through Acton, Maynard and Stow to Hudson Center, with a 4-mile branch from Maynard Center to West Acton. The average capitalization per mile is $26,102 compared with $52,111 for all Massachusetts street railways except the Boston Elevated. The dividend rate has averaged 1 per cent in the sixteen years the company has been operating. The net earnings in 1916 were $27,568, a decrease in that year of 9 per cent as compared with those of 1912. Taxes increased 34.9 per cent since 1912, the operating expenses 19.41 per cent, while the net divisible income decreased 27.41 per cent. R. H. Holt, counsel for the company, stated that the cost of power per car-mile was 5.57

cents in 1916 while the average for Massachusetts companies was 3.13 cents. The present fare on the main line is 6 cents with zones from 3 to 4 miles in length and a 5-cent fare is charged on the West Acton branch.

The company anticipates no difficulties in fare collection on closed cars and expects to apply the new system to open-car service by cutting an aisle through the open cars. The estimated cost of remodeling the cars is about $250 each. It is proposed to accept transfers from connecting roads at each end for a ride within a 1-mile zone.

Chicago to Enforce Traffic Rules

The two ordinances relative to "loading zones" and vehicle parking, in Chicago, Ill., became effective on May 1. They were passed by the City Council on March 12, as reported in the issue of the ELECTRIC RAILWAY JOURNAL of March 17, page 521. In order to accelerate these campaigns the city authorities, prior to May 1 sent to all garage owners, teaming concerns, etc., notices to remind drivers of the new law. The so-called "loading zones" in the downtown districts have been marked off with 7-ft. standards placed on the sidewalk near the curb. The notice sent out to owners and drivers of vehicles was in the form of a 21-in. x 28-in. poster and read as follows:

"'Loading zones,' or spaces, to allow passengers to board street cars are established on various downtown streets by city ordinance, effective on May 1, 1917. These 'loading zones' will be designated by appropriate signs, placed on sidewalks near the curb. Vehicles shall not be permitted to stop within 'loading zones' except upon the signal of a police officer, provided, however, that one vehicle at a time shall be permitted to stop within certain zones for the purpose of loading, or unloading merchandise received from or delivered to, occupants of buildings fronting on certain zones. Vehicles shall pass through loading zones in conformity with the traffic officer's signal and in single file, and shall keep as close as possible to the right-hand curb.

"After May 1, 1917, between the hours of 7 and 10 a. m. and between 4 and 7 p. m., no vehicle shall be permitted to stand on any public street on which street cars are operated within the district bounded on the north by the north line of Lake Street, on the east side by the east line of Wabash Avenue, on the south by the south line of Van Buren Street and on the west by the west line of Market Street, for a longer period than necessary for such vehicle to load or unload its occupants, baggage or merchandise.

"Violators of either of the foregoing ordinances may be punished by a fine not to exceed $100 for each offense."

Dallas Jitney Ordinance Opposed

A temporary injunction against enforcement of the initiative ordinances, including a jitney ordinance, recently adopted in Dallas, Tex., subject to approval in the city election, has been granted by Judge Foree of the District Court of Dallas County. The initiative jitney ordinance was approved by the voters, and was to have become effective after a few days. It required owners of jitney buses in Dallas to make up an indemnity fund of $5,000, or more, to protect the public against injury or property damage. Prospective jitney operators had complied with its provisions, 103 jitney owners having subscribed $50 each to this fund, and it was believed that 100 more would place cars in service after the ordinance went into effect.

The injunction was granted on petition of the Dallas Consolidated Electric Street Railway, the Rapid Transit Railway, and the Metropolitan Electric Street Railway, all of Dallas. It stated that the ordinance was invalid because it had not been printed and sent out to the voters in conformity with the law prior to the election. It was also alleged that it destroys the safeguards of the rights of the people as contained in the previous ordinance of Jan. 5, and that it operates to reduce the possible revenues of the city through licenses. Operation of motor buses under the ordinance would deprive the plaintiffs of gross revenue of about $1,200 a day, it is stated, and would interfere with street car schedules. It is further claimed that the motor bus operators are irresponsible.

One-Man Cars for Fargo, N. D.—The Northern States Power Company is contemplating the substitution of fifteen one-man cars for twelve cars now in service on its street railway system in Fargo, N. D.

Jitney Operator Loses Amount of Bond.—The sum of $2,500, the full amount of the bonds of August Olson of Seattle, Wash., driver of a jitney bus, was awarded by a jury recently to Mrs. Henry Price, in the King County Superior Court. Mrs. Price was run down by a jitney operated by Olson on Sept. 31, 1915. Suit was brought against Olson and John C. Lynch, as ancillary receiver of the Pacific Coast Casualty Company.

Conductor Directs His Passengers.—A safety-first suggestion made by H. K. Stith, a conductor on the Louisville (Ky.) Railway, follows: "I think many accidents would be prevented if conductors would ask passengers who have boarded a car just before it rounds a curve not to walk in to take seats until the car has made the curve. Many times they are thrown against seats or doors and are often hurt. I find it to be a great help on single-truck cars."

Children Rewarded for Safety Suggestions.—As a result of the safety-first contest in the campaign which the Arkansas Valley Railway, Light & Power Company, Pueblo, Col., has been conducting for several months, unusual interest has been manifested by the school children in the company's territory. The company offered five prizes of $2 each for the five best suggestions on the prevention of accidents, and received a large number of excellent replies.

Universal Transfer Plan for Cincinnati.—The Council Committee on street railways has been informed by the Cincinnati (Ohio) Traction Company that a plan for universal transfers is being prepared under the terms of the rapid-transit ordinance, and that it will be submitted to Mayor Puchta for approval before May 15. The plan will go into effect as soon as it is approved. Until a street railway commissioner is appointed the Mayor will act in that capacity.

Another Company Opposes Rowdyism.—The Philadelphia & West Chester Traction Company, Upper Darby, Pa., has placed officers on its interurban cars with instructions that all men who show the least sign of intoxication be put off the cars, or, if their condition is detected, they should not be allowed transportation. Officials of West Chester hail the move with approval, and the work will be continued until the riding is made safer and more comfortable for desirable patrons.

Spokane Jitneys Refuse to Obtain Bonds.—About fifty members of the Individual Auto Owners' & Chauffeurs' Union of Spokane, Wash., have secured a temporary injunction in the Superior Court, which prevents officials from arresting them for operating jitneys without bonds. It is alleged that bonds cannot be secured, but the jitney men are willing to carry liability insurance. In all 100 jitneys are operated in that city without bonds. It is declared that the bond requirement would destroy the business of the jitneys, as all the bonds expire during the next four months. The Spokane jitneys have carried 12,000 passengers daily for two years.

Would-Be Jitney Operators Ignored.—The Public Utilities Commission of the District of Columbia has received applications from more than 250 operators of motor vehicles for permission to operate over periods varying from one round trip a day to regular and frequent trips, and in many cases paralleling the routes of street railways. The commission felt that the large number of applications resulted from the conditions incident to the strike of trainmen of the Washington Railway & Electric Company, Washington, D. C., which was declared on March 12. It was thought probable that these operators would not establish permanent routes, and no action was taken. The commission held that the applicants should be required to secure the usual licenses to operate vehicles for hire.

"Famous Stops" Condemned.—In a recent efficiency talk addressed to car men, G. B. Powell, superintendent of employment of the Louisville (Ky.) Railway, denounced the practice of stopping unnecessarily at carhouses. Mr. Powell said: "The stop at the carhouse is not only famous but has become notorious. To be sure, you must have coal, sand, change, transfers, etc., but why not see that you have a supply of all these things before you start out? In fact, you are required to do so. One minute seems ten to passengers when the stop is made at the carhouse, and especially is this so when the minute drags into two or three while the members of the relief crew finish a game of checkers, put on their coats, comb their hair, brush their shoes, and finally arrive on the street where they should have been when the car was due."

Patrons Object to Tariff.—A complaint signed by more than 150 residents of the vicinity of Horseheads against the Elmira Water, Light & Railroad Company, Elmira, N. Y., has been received by the Public Service Commission for the Second District of New York which asks for the establishment of a 5-cent fare between Horseheads and Elmira, for a fifteen-minute schedule between those places from 5 to 6 p. m., and that the company be compelled to restore the use of ticket books. The tariff under which the ticket books were withdrawn went into effect on Feb. 15, after the regular thirty-days' notice, the effect of which was to increase the fare between Horseheads and Elmira from 7.14 cents to 10 cents. The complainants have been informed that the tariff must remain in effect pending investigation. The complaint has been served on the company and a hearing will undoubtedly follow.

Discontinuance of Crossing Tenders Permitted—The Public Service Commission of Massachusetts has authorized the Bay State Street Railway, Boston, Mass., to discontinue the services of special crossing tenders at the Main Street crossing of the Boston & Maine Railroad, in Wilmington, and at the Central Street crossing of the New Haven road in East Bridgewater. About fourteen trains a day pass these crossing at low speed, and the railroad companies also protect each with a flagman from about 6 a. m. to 7 p. m. The board will require the company to install a wire trolley guard over each crossing, and to make a regular stop within 100 ft. of the track, the conductor to signal the motorman and remain on the track until the car has passed. The board denied the company permission to discontinue a special crossing tender in Winchester on account of the large amount of traffic concerned.

Fare Controversy in Duluth.—The City Council of Duluth, Minn., has proposed that the Duluth Street Railway be compelled to reduce street car fares in that city, since the Public Affairs Committee granted the company permission to double the present 5-cent fare on its Morgan Park line. The agreement was that the line would be extended from Morgan Park to New Duluth, a distance of about 3 miles. With the extension of the system the outlying districts would no doubt be built up and be a source of greater revenue, but the company's financial condition was such that it could not undertake the work on a single-fare basis. The City Council opposed the measure and adopted unanimously a resolution requesting the railway to limit its fares on all lines to 5 cents. On April 16 City Attorney Samuelson, after investigating the company's franchise, stated that in his opinion the Council had no authority over the fares outside the city limits. The only recourse left to the city was to exercise its authority to regulate the city fare and proposed to have it reduced to 3 or 4 cents.

Buses Operate Pending Decision.—Until the Supreme Court of Washington hands down a decision in a case now pending, the Ferry Line Auto Bus Company, operating in West Seattle, will do business without a license, and the injunction granted recently by Judge Everett Smith in the Superior Court, as noted in the ELECTRIC RAILWAY JOURNAL for April 28, page 802, prevents the State and county authorities from interfering. The company refused to pay the annual fee charged auto stage lines on the ground that it is not a stage line. It had offered to pay the fee for operating vehicles for hire, but this was not accepted. The company was fined $50 in the Justice Court for operating without a license and on appeal to the Superior Court it was fined $150. The case then went to the Supreme Court, to determine whether, under the laws of 1915, the line is a stage line. The 1917 law specifically states that bus lines, operated within city limits, do not come under the classification of stage lines, but this law will not be in effect until June 12.

Legal Notes

ALABAMA.—*Company Not Responsible for Collision with Trailer.*

A motorcycle rider, whose machine was not struck by the motor car of a two-car train but by the trailer, could not recover, since he, and not the car, must have brought about the accident. (Hamilton v. Birmingham Railway, Light & Power Co., 72 Southern Rep., 950.)

MAINE.—*Shipper's Employee on Top of Car—Trespasser or Licensee.*

In an action against a railroad for death of the employee of a potato growers' association, fitting a car for the shipment of potatoes, who came in contact with the road's trolley wire when he climbed to the top of the car to release the brake, evidence held to show that at the time of the accident deceased was either a trespasser or a mere licensee, toward whom the road was guilty of no breach of duty. (Allen v. Aroostook Valley R. R., 98 Atlantic Rep., 1027.)

MARYLAND.—*Injury to Passenger When Car Starts.*

To start an electric car while a passenger is in the act of stepping from the rear platform into the car is not negligence, in the absence of any unusual circumstance or condition. (Brocato v. United Railways & Electric Co., 99 Atlantic Rep., 792.)

NEW JERSEY.—*Inviolability of Fare Contract.*

When a traction company organized under the general traction act of 1893 (P. L. page 302; Comp. St. 1910, page 5021), accepts from a municipality an ordinance granting a location of street railway tracks, a regulation of the rate of fares contained therein, if lawful and reasonable, constitutes a contract between the company and the municipality which during the life of the franchise remains inviolable, and it is incompetent for the board of public utility commissioners or the municipality to impose upon the company an additional burden in violation of such contract respecting fares. (Atlantic Coast Electric Railway v. Board of Public Utility Commissioners, 99 Atl. Rep. 395.)

NEW JERSEY.—*Provisions of Traffic Act Not Applicable to Electric Car at Crossing.*

The provisions of paragraph 1 of section 4 of the Traffic act of 1915 (P. L. p. 285), requiring every driver of a vehicle approaching the intersection of a street or public road to grant the right of way at such intersection to any "vehicle" coming from the right, does not impose this duty upon the motorman of a street car. (Reed v. Public Service Ry., 99 Atlantic Rep., 100.)

NEW YORK.—*"Refusal" Must Be Actual Denial.*

A carrier, whose conductor through inadvertence and mistake during a busy time punched the wrong expiration time on a transfer issued to a passenger, does not thereby become liable for the penalty imposed by Public Service Commissions Law (Consol. Laws, chap. 48, sec. 49, subd. 7), for the refusal to comply with the requirements of that section as to the issuance of transfers, since to "refuse" connotes something affirmative, to deny, to decline, to reject, not merely negatively to fail. (Osborn v. International Ry., 161 New York Sup., 1042.)

OHIO.—*Duty of County Commissioners to Maintain City Bridge.*

Where a franchise to construct and operate an electric railway on a free turnpike is granted by a board of county commissioners, one of the conditions of which is that the railway shall maintain and repair all the bridges over the route at its own expense, and under the direction of the county engineer and commissioners, the fact that territory embracing a portion of the turnpike, which includes a bridge theretofore erected by the county commissioners, is duly annexed to a city, does not relieve the commissioners of their duty to maintain the bridge nor serve to transfer to the city authorities any of the rights or benefits accruing to the commissioners under such contract. (Interurban Railway & Terminal Company v. City of Cincinnati, 114 Northeastern Rep., 258.)

Personal Mention

Charles S. Hervey has been reappointed to serve another term on the Public Service Commission of the First District of New York.

Alfred S. March, of New Brunswick, on May 1 succeeded John J. Treacy as a member of the Board of Public Utility Commissioners of New Jersey.

O. R. Sturzinger has resigned as superintendent of the Northwestern Ohio Railway & Power Company, Toledo, Ohio, which office was abolished.

J. B. Ledlie, assistant electrical engineer for the Northern Texas Traction Company, Fort Worth, Tex., has been promoted to succeed E. E. Nelson as electrical engineer.

W. H. Douglass has resigned as superintendent of the Northern Ohio Traction & Light Company, Akron, Ohio, to become general superintendent of the Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio.

John H. Cain, assistant superintendent of transportation of the Rochester Lines of the New York State Railways, has been appointed superintendent of the employment bureau, succeeding George Lawson, resigned.

Arnold Swain has been appointed assistant treasurer of the Key West (Fla.) Electric Company, to succeed R. C. Shepard, who was transferred to the office of the treasurer of the Stone & Webster Management Association, Boston, Mass.

Edward Flad, consulting engineer, St. Louis, has been appointed to succeed John Kennish on the Public Service Commission of Missouri. Mr. Kennish will resume the practice of law in Kansas City after a few months of traveling in the West.

Roydan Douglas and **V. K. Irion,** members of the Public Utilities Commission of New Orleans, La., have been appointed members of the special commission to investigate transportation conditions in that city. All the members of the board are now on the special commission.

Noah W. Simpson, secretary to the Governor of Missouri, has been made successor to Howard B. Shaw on the Public Service Commission of that State. Mr. Simpson was formerly prosecuting attorney of Lewis County, and served one term as representative in the State Legislature.

Newton M. Hudson has been appointed receiver of the Central Park, North & East River Railway, succeeding John Beaver, deceased, and not of the Second Avenue Railroad, New York, N. Y., as reported last week. Mr. Hudson is auditor of the latter road and continues in that capacity.

J. J. Chisholm has been appointed superintendent of power of the New Orleans Railway & Light Company, New Orleans, La., to succeed E. B. McKinney, who had been with the company more than twenty years. Mr. Chisholm was formerly superintendent of power of the Tennessee Coal & Iron Company in Birmingham.

F. S. Richards has been appointed cashier and assistant treasurer of the Brooklyn (N. Y.) Rapid Transit Company, succeeding W. J. O'Neill, deceased. Mr. Richards began his services with the Brooklyn company as clerk in the treasurer's department in 1898, and four years later was made assistant cashier, the position he has just resigned.

Charles Whiting Baker has retired from the position of editor of *Engineering News-Record* and has become consulting editor of the paper. Frederick E. Schmitt, who was associate editor of *Engineering News* from 1902 until its consolidation with *Engineering Record* as *Engineering News-Record* a few weeks ago, succeeds Mr. Baker as editor.

George H. Ross, Jr., has resigned as superintendent of the railway and gas departments of the Trinidad Electric Transmission Railway & Gas Company, Trinidad, Col., to accept a government position in the engineering department of the Newport News Shipbuilding & Dry Dock Company, Newport News, Va., for the period of the war. Mr. Ross intends to return to electric railway work.

E. E. Nelson, for the last eleven years electrical engineer for the Northern Texas Traction Company, Fort Worth, Tex., has entered the service of the Adirondack Electric Power Corporation at Utica, N. Y. Before his departure a banquet was tendered him by officials and employees of the company, who presented him with a gold watch and chain as a token of their esteem.

George Carson, claim agent of the Fifth Avenue Coach Company, operating buses on Fifth Avenue, New York, N. Y., was the subject of a complimentary sketch in the April number of *Bus Lines*, that company's publication. Mr. Carson is an expert in safety and accident-prevention work, having been one of the first to originate safety committee organizations as applied to electric railways.

R. R. Hadsell has been appointed assistant superintendent of transportation of the New York State Railways, Rochester Lines. Mr. Hadsell was formerly division superintendent of the United Traction Company, Albany, N. Y. He started his electric railway career as a conductor for the International Railway, Buffalo, N. Y., in 1901, and remained with that company for three years, when he resigned to become inspector of city lines for the Schenectady (N. Y.) Railway. In 1913 he entered the service of the United Traction Company in the position which he has just relinquished.

H. C. Morris, general manager Dallas (Tex.) Gas Company, was elected president of the Southwestern Electrical & Gas Association at its annual meeting in Dallas, held on April 26-28. Mr. Morris was born in Detroit in 1879, and entered the service of the Detroit City Gas Company in 1898. For two years following 1902 he was superintendent of the Saginaw (Mich.) City Gas Company, and thereafter until 1908 he acted as assistant general manager of the Bay City Gas Company and the Bay City Traction & Electric Company. He then went to Dallas as superintendent of the Dallas Gas Company, with which he is now connected, and was later made general manager.

John O. Wiegel has been appointed acting general superintendent of the International Railway, Buffalo, N. Y., to succeed Nelson H. Brown, resigned. Mr. Wiegel went to Buffalo several months ago to become superintendent of schedules, having resigned as chief of the time-table department of the Brooklyn (N. Y.) Rapid Transit Company. His twenty years of electric railway work were begun in Brooklyn in the shops and he steadily worked up through the ranks to his last position. Scientific schedule making was early adopted on the Brooklyn Rapid Transit System and was inaugurated under Mr. Wiegel's supervision with marked results. He has already effected changes in the service of the International Railway to relieve the present traffic situation in Buffalo.

William F. Stanton, who was formerly assistant to the general manager of the Schenectady (N. Y.) Railway, has accepted a position as assistant to James F. Hamilton, general manager of the New York State Railways, Rochester Lines, who was until recently general manager of the former road. Mr. Stanton began his railway career in 1904 with the Schenectady Railway. After three years of service in various capacities in the clerical department he held the position of secretary to the general manager for several years. Mr. Stanton is secretary-treasurer of the New York Electric Railway Association. He was elected to that office in 1915 well qualified for its responsibilities, as he had been for a few years previously secretary to two presidents of the association, Messrs. Peck and Hamilton. By reason of his central location and familiarity with the New York association he has served it in addition to his other duties and has shown an unusual interest in its affairs.

J. F. Uffert, formerly master mechanic of the United Traction Company, Albany, N. Y., has accepted a similar position with the New York State Railways, Rochester Lines, succeeding G. M. Cameron. Mr. Uffert was born in Newark, N. J., in 1880 and began railway work with the Consolidated Traction Company of that city, now a part of the Public Service Railway. He then served as shop foreman a few years for the Union Railway, New York, after which he went West to become assistant superintendent of equipment for the Tacoma Railway & Power Company and the Puget Sound

Electric Railway of Tacoma, Wash. Mr. Uffert became master mechanic of the United Traction Company in 1912 after serving for one year in that capacity for the Hudson Valley Railway, Glens Falls, N. Y., both subsidiaries of the Delaware & Hudson Railroad.

J. B. Stewart, Jr., has been appointed assistant to the general manager of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. Mr. Stewart is a graduate of the High School at Newton, Mass., and the Massachusetts Institute of Technology. He entered the railway field as an engineer for the Middlesex & Boston Street Railway, Newtonville, Mass., and left that company to accept a position as assistant to the general manager of the Buffalo & Lake Erie Traction Company at Erie, Pa. In 1910 he was engaged on the construction of the Corning division of the Elmira, Corning & Waverly Railroad, Waverly, N. Y., later becoming superintendent. Two years later Mr. Stewart joined the organization of the Lehigh Valley Transit Company, Allentown, Pa., as park manager and acted as assistant to the traffic manager. He has been with the company which now employs him since 1913, serving in the capacities of safety and efficiency engineer and superintendent of freight, and just previous to his recent appointment he was superintendent of equipment and traffic.

Nelson H. Brown has been transferred from his position as general superintendent of transportation of the International Railway, Buffalo, N. Y., to that of manager of the electric railway properties of the New Orleans Railway & Light Company, New Orleans, La., both subsidiaries of the United Gas & Electric Corporation. In appreciation of his services and as an expression of the esteem in which he is held by officials and department heads of the International Railway, he was presented with a diamond ring and a set of diamond cuff links. Mr. Brown began his service with that company four years ago and was successively assistant superintendent and superintendent of the Buffalo division and finally general superintendent of the company. He has had a wide and varied experience in railway service, which he began in the mechanical department, and later as a fireman for the New York Central Railroad. Other lines with which he has been connected are the Consolidated Street Railway, Syracuse, N. Y., and its successors, the Syracuse Rapid Transit Company, the Worcester (Mass.) Consolidated Street Railway, the Worcester & Southbridge Street Railway and the Albany (N. Y.) Southern Railway. Many changes and improvements in the International Railway can be credited largely to Mr. Brown's able management.

N. H. BROWN

Obituary

Mark Lowd, southwestern manager of the Stone & Webster Engineering Corporation, died of pneumonia at his home in Dallas, Tex., on April 27. Mr. Lowd was born in Salem, Mass., in 1870. After completing the Salem High School course he spent three years in the United States Naval Training School at Newport. He then took a course with the Thomson-Houston Electric Company, and several years later became associated with C. E. Hubbard in Boston, Mass., on the work of perfecting the third-rail system. He next entered the employ of the Narragansett Electric Light Company at Providence, R. I., and in 1902 became associated with Stone & Webster as chief engineer and superintendent of construction for the Seattle (Wash.) Electric Company. Mr. Lowd had been Southwestern manager for the Stone & Webster Engineering Corporation since 1907, with the exception of two years, when he was transferred to Galveston to supervise the construction of the Galveston-Houston interurban.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***South Florida Interurban Railway, St. Cloud, Fla.**—This company, organized under the laws of Arizona, has filed a charter with the Secretary of State of Florida for the purpose of constructing an electric railway from Melbourne west to Haines City, north to St. Cloud, Orlando and Sanford, thence west through Marion, Lake and Citrus Counties on the west coast, entering Tampa from the north and finally completing the loop at Haines City. Headquarters are at St. Cloud. Officers: Charles D. Brenner, president; John H. Bowlin, vice-president; Frederic B. Stanley, treasurer, and William Hall, secretary.

***Charleston-Gauley Electric Railway, Charleston, W. Va.**—Incorporated in West Virginia to construct a line from Charleston along the north bank of the Kanawha River to Gauley bridge, about 35 miles. Capital stock, $100,000. Charles C. Dickinson, president. Incorporators: George P. Alderson, George B. Brooks, John Y. Arter, B. T. Clayton and J. H. Nash, all of Charleston.

FRANCHISES

Little Rock, Ark.—The Little Rock Railway & Electric Company has received a franchise from the City Council to double-track its Pulaski Heights line on Prospect Avenue from Lee Avenue to I Street.

Victoria, B. C.—The British Columbia Electric Railway Company, Ltd., has asked the City Council for a franchise to double-track part of its line on Esquimalt Road.

Evanston, Ill.—The Evanston West Side Railway has asked the City Council for a franchise to construct a double-track line on Howard Street to Asbury Avenue, north on Asbury Avenue to Crain Street, west on Crain Street to Ashland Avenue and north on Ashland Avenue to Church Street; also two cross-town branches, one on Main Street to the western city limits, and one on Church Street to the western city limits. Clement C. Smith, president of the Evanston Railways, is the promoter of the new road. [Feb. 17, '17.]

Wilmette, Ill.—The voters of Wilmette, at a recent election, defeated the ordinance passed by the village board granting the Chicago, North Shore & Milwaukee Electric Railroad a twenty-year extension of its franchise. The company's present franchise has six years more to run.

Ithaca, N. Y.—Looking toward the most important improvements for the city of Ithaca that have been undertaken in recent years, the Common Council by a vote of eight to two, recently granted two franchises to the Central New York Southern Railroad and the Ithaca Traction Corporation. The two franchises include one permitting the Central New York Southern Railroad to enter the city of Ithaca by a new route in the northwestern section and another granting to the Ithaca Traction Corporation the privilege to operate its cars over the Central Southern lines within the city limits. The two railway corporations plan to expend several hundred thousands of dollars in improvements.

New York, N. Y.—The Union Railway has received a franchise from the Board of Estimate and Apportionment to construct and operate a trolley line connecting with its present system at the 207th Street bridge and continuing along Amsterdam and Nagle Avenues to the Dyckman Street ferry. Construction on the new line will be begun at once, and it is expected that operation will be begun by June 15.

Salt Lake City, Utah.—The Salt Lake & Utah Railroad has asked the City Commission for a franchise to construct a line on Seventh West Street from South Temple Street to the south limits of the city.

Tacoma, Wash.—The Tacoma Railway & Power Company has asked the County Commissioners for an extension of its franchise so as to include Browns Point and practically all the territory between Tacoma and the King County line.

Tacoma, Wash.—The City Council of Tacoma, Wash., recently voted to ask Pierce County for a twenty-five-year franchise, giving the city the right to lay and maintain a single or double track with proper sidings and to operate an electric railway on South Eleventh Street from Sitcum Avenue to Commencement Bay Boulevard, thence to Lincoln Avenue; along Lincoln Avenue to Twenty-first Street; thence on Twenty-first Street to the city limits; also along the proposed street when opened between South Eleventh Street and Lincoln Avenue, near the Hylebos Creek Waterway.

TRACK AND ROADWAY

***Cascade Scenic Railway, Banff, Alta.**—Work will probably be begun this year by the Cascade Scenic Railway on the construction of a railway up the mountain near Banff. Harold Johnson, engineer.

Edmonton, Alta.—A communication from the Delta Copper Company, Edmonton, states that the company does not contemplate the construction of an electric railway, as reported in the ELECTRIC RAILWAY JOURNAL for March 24.

Visalia Electric Railroad, Exeter, Cal.—A contract has been let by the Visalia Electric Railroad to O. Ford, Riverside, for 6 miles of roadbed about 4 miles southeast of Portersville, 4½ miles of which will be main line and 1½ miles a branch line to rock quarry.

Pacific Gas & Electric Company, Sacramento, Cal.—It is reported that the Pacific Gas & Electric Company will reconstruct its entire system in Folsom.

West Coast Electric Railway, Sarasota, Fla.—This company's proposed line from Tampa to Venice will be built via either Bayshore or Parish. Three steel bridges will be built in connection with the line. Construction bids will be asked immediately after local work is finished. It is reported that the line will be operated with Edison storage-battery cars. E. M. Raymond, 1323 Land Title Building, Philadelphia, Pa., president, and A. E. Townsend, Sarasota, Fla., general manager and chief engineer. [Feb. 3, '17.]

Tampa & Eastern Traction Company, Tampa, Fla.—Work on this company's electric line between Tampa and Lakeland has been temporarily discontinued, according to E. J. Binford, vice-president of the road, because of the war situation. Much filling and grading have been done on the right-of-way and some of the ties for the road have been laid, although no tracks have been put down as yet. [Oct. 28, '16.]

Caldwell (Idaho) Traction Company.—Walter R. Sebree, president of the Caldwell Traction Company, reports that the company plans the bonding of its properties for $100,000 for the purpose of electrifying its Wilder branch and extending the present lines. The construction of a loop extending through the Gem District and connecting the Lake Lowell branch of the system with the Wilder branch, the latter crossing the Snake River near Homedale, is planned.

Fort Wayne & Decatur Traction Company, Fort Wayne, Ind.—This company has petitioned the Public Service Commission of Indiana for permission to issue $100,000 in bonds, part of the proceeds of which will be used for extensions and improvements.

Arkansas Valley Interurban Railway, Wichita, Kan.—Rails have been delivered and ties ordered for an extension to be built this summer by the Arkansas Valley Interurban Railway. Negotiations are now under way to construct industrial tracks to various points now being built and work is being done on right-of-way that will change the route of the cars through the city of Wichita. Instead of passing through the city on the main street, as now, the extension planned will route the cars west of the town to a connection with the Midland Valley Railroad. The passenger cars will reach the union station over tracks of the Wichita Railway & Power Company, and will loop back by the site of a projected $1,000,000 hotel.

***Wichita-Walnut Valley Interurban Railway, Wichita, Kan.**—This company has been organized at Wichita with an initial capital stock of $1,000,000 to construct an electric railway from Wichita to the oil fields of Butler County, about 35 miles. Two routes are under consideration, one from Wichita to El Dorado, via Augusta; the other through Andover, Benton and Towanda to El Dorado. Regular passenger and freight service will be established. It is expected that construction work will be begun early in the summer. Temporary officers were elected as follows: J. H. Butts, president; T. C. Coffman, secretary, and L. S. Naftzger, treasurer.

Ashland, Ky.—Powell & Clarke, Ashland, have been engaged as engineers for the proposed electric railway to be built from Ashland to Russell, about 5 miles. The Vaughan Construction Company, Shawsville, Va., has the contract for the construction of the road. The line may be extended to Greenup, 10 miles distant. [April 7, '17.]

Paducah (Ky.) Traction Company.—Work has been begun by the Paducah Traction Company double-tracking its line from Eleventh to Seventeenth Street on Broadway.

Detroit (Mich.) United Railway.—Grading has been begun by the Detroit United Railway on its extension from Highland Park to Royal Oak. The line will extend out on Oakland Avenue, and the entrance into Royal Oak is planned to be on Fourth Avenue.

Billings (Mont.) Traction Company.—A company headed by several local bankers and capitalists has been formed at Billings with a capital stock of $500,000 to take over the property of the Billings Traction Company. The present system will be electrified and the lines extended.

Woodbury, N. J.—It is reported that right-of-way has been obtained for the construction of an electric railway from Woodbury to Paulsboro. It is proposed to build the line out West Center Street, across the Bell tract and strike the Crown Point road in a direct line. A committee has been appointed by the City Council to work in conjunction with the Board of Trade. [Dec. 2, '16.]

New York State Railways, Utica, N. Y.—The Public Service Commission for the Second District of New York has ordered the New York State Railways to rebuild its track in Main Street, Whitesboro. The order of the commission requires that one-half of the work be done during 1917 and the remainder next year, and that pending the completion of the new track the old track must be kept in a condition adequately safe for the operation of cars.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.—Judge Phillips, of the Common Pleas Court, recently rendered a decision giving the Cleveland, Southwestern & Columbus Railway the right to build its track across land leased from the West Cuyahoga County Agricultural Society. The County Commissioners brought suit to enjoin the company from using the land. This will enable the company to complete construction of its tracks around the village of Berea, where it was refused a renewal of franchise unless a reduction of fare was made between that point and Cleveland.

Lake Shore Electric Railway, Cleveland, Ohio.—Application has been made by the Lake Shore Electric Railway to the Public Utilities Commission of Ohio for authority to issue $51,000 in bonds, the proceeds to be used for improvements, etc.

Springfield (Ohio) Railway.—H. J. Crowley, general manager of the American Railways Company, which controls the Springfield Railway, has announced that an extension will be built to the Northern Heights addition this year. It was stated that other extensions planned for this year would probably not be made, owing to the steel shortage.

Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio.—This company has petitioned the Public Utilities Commission of Ohio for permission to issue $68,000 in bonds, the proceeds to be used for extensions and improvements to its system.

Youngstown & Suburban Railway, Youngstown, Ohio.—The Municipal Service Corporation, Philadelphia, which recently purchased the Youngstown & Suburban Railway, plans a number of improvements in the line.

Tulsa (Okla.) Street Railway.—Work will be begun at once by the Tulsa Street Railway double-tracking a large part of its system in Tulsa.

London & Port Stanley Railway, London, Ont.—Bids will soon be asked by the London & Port Stanley Railway for 30 tons of 80-lb. rail for switching lines. J. E. Richards, London, manager.

***Klamath Falls, Ore.**—The City Council of Klamath Falls has asked for bids for the construction of a municipal railway to extend from Second Street and Klamath Avenue to a point near Dairy, 20 miles east of Klamath.

Philadelphia, Pa.—Bids were opened by the Department of City Transit on May 1 for foundation work on the Frankford elevated line. Edwin H. Vare presented a substitute bid for work upon which he bid $17,700 about a year ago. Two weeks ago he informed transit officials that the figures were far too low in view of advanced prices and asked permission to submit a new bid. This he did, the figures reported on May 1 being $37,750.

Dallas Northwestern Traction Company, Dallas, Tex.—A charter has been granted by the State Department to the Standard Utilities Construction Company, which is organized for the purpose of constructing the proposed electric railway of the Dallas Northwestern Traction Company from Dallas to Slidell, via Denton, about 58 miles. Capital stock, $100,000. Incorporators: M. W. Deavenport and H. Rowe, Denton; Ira E. Cornelius, Muskogee, Okla., and C. F. Hopkins, Tulsa, Okla. [April 14, '17.]

Northern Texas Traction Company, Dallas, Tex.—This company has been ordered by the City Commission of Dallas to reconstruct its tracks on Tyler Street between Seventh and Tenth Streets, and on Seventh Street between Bishop and Tyler Streets. Heavier ties laid on concrete foundation in connection with the laying of pavement on these streets are ordered.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—This company will construct an extension of its East Union Street line from Twenty-ninth Avenue to a connection with the Madrona Park line at Thirty-fourth Avenue.

Appalachian Power Company, Bluefield, W. Va.—It is reported that this company contemplates the extension of its line from Bluefield to neighboring sections, including about 40 towns, covering a distance of about 50 miles.

SHOPS AND BUILDINGS

Indiana Railways & Light Company, Kokomo, Ind.—The first move toward a larger terminal station in Kokomo has been made with the sale of the present station building of this company to T. C. Rapp, president of the American Trust Company. It is reported that George J. Marott, president of the Indiana Railways & Light Company, has acquired title to the ground at the southwest corner of Union and Superior Streets. The construction of the new station is in keeping with a line of improvements which will involve the expenditure of $150,000. New machinery for the power plant, most of which has already been purchased, extensions to the city street car line in Kokomo and electric light improvements are parts of the program.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—Work has been begun by this company on its new passenger and freight station at Brocton.

Ithaca (N. Y.) Traction Corporation.—A new station to cost about $50,000 will be erected by the Ithaca Traction Corporation and the Central New York Southern Railroad at the corner of State and Meadow streets.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York is advertising for bids to be received by May 16 for the construction of station finish on the nine stations on the new subway lines in Flatbush Avenue and Eastern Parkway, Brooklyn. One of the nine stations, that at Seventh and Flatbush Avenues, will be operated by the New York Municipal Railway Corporation, as it is located on the line of the connection now being constructed between the Brighton Beach line and the Fourth Avenue subway. The remaining eight stations are all on the subway line to be operated by the Interborough Rapid Transit Company in Flatbush Avenue and Eastern Parkway. The structure in Flatbush Avenue is six tracks in width, four of which are for operation by the Interborough Rapid Transit Company and two by the New York Municipal Railway. The commission has also awarded to John B. Roberts, New York City, a contract for the construction of station finish for three stations on the Manhattan portion of the Park Place, William and Clark Street subway. The contract price for the work was $139,919.

Philadelphia, Pa.—Director Twining, of the Department of City Transit, Philadelphia, rejected as too high the bid of the McClintock-Marshall Company resubmitted on May 1 for the construction of a steel station at Huntingdon Street. Sealed proposals for this station will be received by the Department of City Transit until May 15.

Jefferson County Traction Company, Port Arthur, Tex.—A contract has been awarded by the Jefferson County Traction Company, owned by the Eastern Texas Electric Company, to the Secrist Construction Company, for the construction of a brick and tile interurban station.

POWER HOUSES AND SUBSTATIONS

Edmonton (Alta.) Radial Railway.—The installation of a motor generator set by the Edmonton Radial Railway, to cost $6,100, has been recommended by J. H. Moir, traffic manager.

Fort Smith Light & Traction Company, Fort Smith, Ark.—This company will construct a 30-mile transmission line to supply Huntington and Greenwood from its Fort Smith plant. All contracts for material have been closed.

Pacific Gas & Electric Company, Sacramento, Cal.—This company is reconstructing the substation on the Marysville Road, Oroville, which was destroyed about two years ago. Work has also been begun by the company on the reconstruction of its plant at the foot of Huntoon Street. The lighting equipment in the business section of Oroville will be replaced with a modern system.

Georgia Railway & Power Company, Atlanta, Ga.—This company is erecting a new 110,000/38,000-volt substation at Norcross to feed the Stone Mountain line. The line from Norcross to Stone Mountain will be 10 miles long. The station will be equipped with two banks of three 1000-kva. General Electric transformers, with one spare for each bank.

Illinois Northern Utilities Company, Freeport, Ill.—Contracts have been awarded by the Illinois Northern Utilities Company for the erection of a new $70,000 steam power plant in Dixon. The Adams Construction Company, Chicago, received the contract for the substructure and superstructure at $45,000, and the Lakeside Bridge & Iron Company, Milwaukee, received the contract for the structural steel work at $23,000.

Springfield (Mass.) Street Railway.—Arrangements have been made by the Springfield Street Railway under which power for its entire system will be secured from the Turners Falls Power & Electric Company. The engine-driven plant in Springfield will be shut down and a modern substation system provided. As announced in the ELECTRIC RAILWAY JOURNAL of April 21, page 748, President Cabot of the Turners Falls company has stated that within the next two or three years about $3,000,000 will be expended in the extension of the generating and transmission facilities of that company.

Interborough Rapid Transit Company, New York, N. Y.—Improvements are contemplated by the Interborough Rapid Transit Company to its substation on Nineteenth Street, to cost about $15,000.

Sand Springs Railway, Tulsa, Okla.—This company has purchased from the Westinghouse Electric & Manufacturing Company a 3125-kva. turbine unit, a duplicate of the one now being installed. The company now has three units, a total of 7500 kva.

Lehigh Valley Transit Company, Allentown, Pa.—A new 15,000-hp. turbine for the Lehigh Valley Transit Company's plant in Allentown has been completed by the Westinghouse Electric & Manufacturing Company and this will bring the capacity of the plant up to 45,000 hp. It is reported that increased demand from the electric railway and from industrial establishments in the Lehigh region will absorb all the added power.

Harrisburg (Pa.) Railways.—Extensions and improvements in its power plants are being considered by the Harrisburg Railways.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Helping to Reduce Selling Costs

Economizing Time of the Purchasing Agent and the Salesman—Old-Fashioned Salesmen Being Supplanted Rapidly

BY W. V. C. BUCKELEY
Purchasing Agent Columbus Railway, Power & Light Company

I have read the article by L. W. Horne in the issue of the ELECTRIC RAILWAY JOURNAL for April 14, and agree with him absolutely that the consumers must pay all selling expenses. When salesmen are delayed, the selling expenses are increased, and this necessarily increases the cost of the article sold.

I make it a practice to save as much of a salesman's time as possible, by having definite office hours printed on my letterhead, stating the time at which I shall see all salesmen that come into the office. Inasmuch as my duties take me from the office every afternoon, this saves the salesmen the time that otherwise would be lost at finding me absent. In cases where it is necessary to give any particular attention to an order, I make an appointment for the afternoon. This clears the way for other salesmen whom we can interview quickly during the morning office hours.

I have no hesitancy in turning down a salesman flatly and offering him absolutely no encouragement in case his product does not appeal to me. I have noticed that there are a number of salesmen, in fact, quite a large number, who have the idea that the purchasing agent is all wrong if he does not buy their particular goods inasmuch as they represent the very best in that particular line, etc. Conversation of this sort unnecessarily takes up the time of both the salesman and the purchasing agent. The manufacturing concerns are realizing that the snappy, up-to-the-minute salesman, although he may cost more in the way of salary, is really most efficient in the end. This type of salesman helps to reduce the selling cost, as he gives the purchasing agent more time to himself which, in turn, will insure that he can give the salesmen more prompt attention.

Another method by which I exert an effort to reduce selling costs is through the forwarding of a bid form for products that I buy to the different manufacturing concerns on my list. A 2-cent stamp placed on the envelop to return this bid form to me is just as efficient and reliable as the call of the salesmen, and in some cases more so. I do not under any consideration accept a second price from any one competitor without giving the same chance to all other competitors, and a second price is not accepted unless the market conditions warrant such change. I feel that when salesmen know that they have but one chance to figure on an order, they will submit their best price first, and this, of course, saves considerable time, both on the part of the buyer and seller.

Steel Pole Prices Make History

Even at Top Notch Prices Inquiries Are Frequent for Large Lots—Range of Prices Given for Twenty-two Years

Very few tubular steel poles are now available for purchase. The manufacturers of skelp suitable for steel poles are in the midst of the most congested period of the steel industry and hesitate to make any promises for future delivery. Also, the government has indicated to some manufacturers that it may require part or all of their productive capacity, and this prevents the manufacturers from contracting for any orders which might interfere with government requisitions. The makers of steel poles are now beset with prospective purchasers of flagpoles. These poles are made from the large size tubing such as is used for the manufacture of trolley poles.

PRICES CONTINUE TO CLIMB

The exact situation is clearly indicated by the fact that some manufacturers have been forced to refuse orders for steel poles in lots of 500 or more from single purchasers. This is in spite of the high cost of pole steel, which is $6.50 per 100 lb. The need for placing purchases early, even at present prices, is evident from the statement of one large pole manufacturer, who, with single poles at from $85 to $90, has issued quotations on more than his available stock. Steel poles are now being quoted at the highest prices ever reached, and owing to the general steel market situation no manufacturer is in a position to make quotations except for immediate acceptance.

Through the courtesy of A. L. Johnston, sales manager of the Electrical Engineers Equipment Company, Cincinnati, Ohio, this paper has been supplied with the accompanying statement of this company's average yearly selling prices on standard-weight tubular steel poles for each year since 1895. These prices are reproduced here because of their value for appraisal purposes and to show how present prices are far in excess of any in previous years. The quotations are for standard-weight poles per 100 lb.:

1895....	$2.40	1900....	$3.50	1905....	$2.70	1910....	$2.35
1896....	2.30	1901....	3.25	1906....	2.80	1911....	2.30
1897....	2.00	1902....	3.50	1907....	3.25	1912....	2.30
1898....	1.90	1903....	3.20	1908....	3.00	1913....	2.40
1899....	4.00	1904....	2.85	1909....	2.40	1914....	2.20

For the year 1915 the price averaged $2.35 per 100 lb. until Nov. 17 and then rose to $2.40. And for 1917 prices ranged from $2.40 in January to $3.65 in April and later to $5 for stock shipments. This price ruled for January, February and March, 1917, for such stock as the manufacturer had in hand. The price now is about $6.50, and no quotations can be made for the future.

Regulating Coal Prices

Philadelphia Paper, Recognizing Plight of Some Utilities, Suggests Compulsory Standardization of Coal Prices

The problem that confronts the electric railways in securing a continuous supply of steam coal at reasonable prices was recently called to the attention of the readers of the ELECTRIC RAILWAY JOURNAL in an interview which appeared on page 623 of the March 31 issue by Frank J. Petura, purchasing engineer of the Doherty Operating Company, New York. The first difficulty that the electric railways experienced in connection with their coal supply was that growing out of the car shortage last fall. At that time some companies in the Middle West were compelled to go out into the open market and purchase coal at prices two or three times greater than those normally obtaining under long-time contracts. Another company with a contract which expired recently succeeded in renewing its contract, but at prices considerably in advance of those that prevailed before. Last week mention was made in these pages of four interurban roads in Indiana combining in self-defense to finance a coal-mining proposition. These roads are the Terre Haute, Indianapolis & Eastern Traction Company, the Indianapolis Traction & Terminal Company, the Union Traction Company of Indiana, and the Fort Wayne & Northern Indiana Traction Company. Only the week before the W. S. Barstow & Co. interests announced the incorporation of a company to acquire a coal-operating property in West Virginia, the output to be available almost immediately for use by subsidiaries of the General Gas & Electric Company and the Eastern Power & Light Corporation at the contract price in effect last October. Few companies, however, are so organized that the alternative is possible of mining coal for themselves. The following suggestion for a possible way to obtain a measure of relief in the future was contained in the financial letter of the Philadelphia *Public Ledger* on April 28:

"Each day brings out further evidence of the difficulties under which the public utility companies are now operating. Reporting for March, the Northern Ohio Electric Corporation shows a gain of 33.54 per cent in gross earnings, but an increase of 70.10 per cent in operating expenses. Abnormally high prices for coal caused increases in expenses of $51,439 for the month, and for three months of this year the high cost of coal has added $193,017 to this company's costs. For March the Republic Railway & Light Company shows a gain of 14.17 per cent in gross, but an increase of 23.69 per cent in operating costs. Of the increased expenses, $26,338 went for coal at abnormally enlarged prices. The subject is rapidly crystallizing to a point where the public utility managers will have to get together and go before the various state commissions for relief. They may very properly use the argument that, if their companies are to be regulated as to rates, the fuel companies from which they buy should also be compelled to standardize fuel prices."

Standard Sizes of Catalogs

Technical Publicity Association, Which Includes Prominent Manufacturers in Its Membership, Adopted Four Sizes as Standard More Than Three Years Ago

In 1913 the Technical Publicity Association, through its standard size catalog committee, made a careful investigation of the various sizes of catalogs in use, and after considerable correspondence with paper manufacturers, with machinery and supply houses, and with a number of technical societies and associations, adopted 3½ in. x 6 in. for postal cards and envelop inclosures, 8 in. x 10½ in. for bulletins, and 6 in. x 9 in. and 8½ in. x 11 in. for catalogs. As the association includes many of the largest manufacturers in the electric railway industry, such as the General Electric Company, Westinghouse Electric & Manufacturing Company, Western Electric Company, H. W. Johns-Manville Company, Crouse-Hinds Company, the Texas Company, the Ingersoll-Rand Company, the C. W. Hunt Company, the Goldschmidt Thermit Company, the J. G. Brill Company, the Cutler-Hammer Manufacturing Company, and many others, it is interesting to note the progress made by these various firms in regard to following out the standards as prescribed by the T. P. A.

The J. G. Brill Company, through its publicity manager, S. M. Wilson, recently said: "It is undoubtedly very desirable to have all publications standardized for the convenience of those who must file large numbers for reference purposes, and we have endeavored to follow standard dimensions in all possible cases. The Brill magazine, which serves as a bulletin or running catalog of our products, as well as having a magazine character, has been 6 in. x 9 in. throughout the ten years of its existence. For the last year or two we have been issuing bulletins covering individual types of trucks, classes of cars, and special features. These are made 8 in. x 10½ in., which is the standard bulletin size, to enable them to be inserted in 8½-in. x 11-in. binders. As a member of the T. P. A. I voted for these standards, and can assure you that technical publicity managers everywhere are heartily in favor of them not only because of the convenience in filing by the users of such literature, but because they enable paper stock to be cut with less waste."

According to W. D. Lindsey, assistant advertising manager of the Western Electric Company, one exception to the standards of the T. P. A. has been employed. He said: "We have practically adopted for postal cards and envelop inclosures the size 3½ in. x 6 in., but when it comes to catalogs, we are compelled to adopt a size 6½ in. x 9½ in. for our annual book, because the size of our type page, of which we had a thousand or more in standing form, was 5½ in. x 8½ in.—in other words, too large to set on a leaf 6 in. x 9 in. In order to save the enormous expense of resetting all these pages, we chose the 6½-in. x 9½-in. size book. We want to follow the T. P. A. standards, but it so happened that we could not do it at that time, nor can we as yet, because pages set up since have been made to correspond with the old standard, namely, 5½ in. x 8½ in. for the printed matter."

H. M. Davis, manager of the advertising department of the Sprague Electric Works of the General Electric Company, says: "Our publications have been standardized to the following dimensions: Small envelop size, 3½ in. x 6 in.; large envelop size, 4 in. x 9 in., and bulletin size, 8 in. x 10½ in. When we publish an elaborate bulletin or catalog bound with a hang-over cover, the dimensions have exceeded by ¼ in to ½ in. the 8 in. x 10½ in. size."

Another company that deviates from the T. P. A. standards in one instance is the Cutler-Hammer Manufacturing Company. George J. Kirchgasser, its advertising manager, writes: "Some time ago the catalog covering our products was changed so that we now have what we call price and data bulletins which measure 4 in. x 7 in., and contain condensed information, while our descriptive literature is all in the 8½-in. x 11-in. size. The small folders that we use for envelop inclosure are usually 3⅝ in. x 6 in. We have had some trouble in supplying sheets to electrical supply jobbers because of the fact that the size of their catalog is about 8½ in. x 10 in."

C. W. Hunt Company, Inc., through George K. Jenckes of the advertising department, says: "Our standard catalog size for some time has been 6 in. x 9 in., and our postal cards and envelop inclosures 3¼ in. x 5½ in. We expect to use these sizes in all of our work wherever possible."

Lastly, Charles A. Hirschberg, publicity manager of the Ingersoll-Rand Company, who has recently been elected president of the T. P. A., says: "The writer has for some years subscribed to the resolution of the standard sizes for catalogs and advertising literature. All of this company's literature is in accordance with the T. P. A. standards."

Decrease in Exports for February

Exports of electrical goods were less in value in February than in any month since last July. The February exports amounted to $3,526,269, or about $1,400,000 less than in January. In comparison with February, 1916, however, there was an increase of $1,000,000.

For the eight months ended February, 1917, the exports of electrical goods totaled $31,744,237, in comparison with $18,151,223 for the corresponding period ended February, 1916, and $12,205,421 for that a year previous.

The total exports for the first two months of the current year amounted to $8,439,193, as compared with $5,163,433, for the first two months of 1916. Should the exports for the remainder of the year keep up at this rate, the 1917 figures will total over $50,000,000.

G. E. Appoints Sales Manager

J. R. Lovejoy, vice-president of the General Electric Company, has announced the appointment of John G. Barry as general sales manager of the company. Mr. Barry entered the employ of the company in the production department of the Thomson-Houston Company, at the Lynn Works. He then became connected with the Boston District office, and later was transferred to the general office in New York City. He went to Schenectady at the time the general offices were moved to that city. He has held the positions of assistant manager of the railway department, superintendent of construction, and manager of the railway department. Mr. Barry has been a resident of Schenectady for the past twenty years and his host of friends will be glad to learn of his advancement and increased responsibilities. Mr. Barry continues his present duties as manager of the railway department.

National Defense Committee Reports

Under date of April 30 the American Electric Railway Association's special committee on national defense issued a notice in which it said that the steam railroads of the United States had been ordered to give iron ore and coal preference over all other traffic. The committee explained that the reserve stocks of coal in many sections of the country had become depleted owing to an unprecedented consumption during the past year and it recognized the paramount need of the largest possible movement of coal to every part of the country during the coming warm months. The rule states that gondola and hopper cars when made empty must be sent loaded or emptied to or in the direction of the home road. Every movement of the car must be in the interest of apparent return to the home road; if necessary short-routing empty cars without charge.

NEW YORK METAL MARKET PRICES

	March 31	May 3
Prime Lake, cents per lb	35	31
Electrolytic, cents per lb	35½	31
Copper wire base, cents per lb	42	36
Lead, cents per lb	9½	9⅞
Nickel, cents per lb	50	50
Spelter, cents per lb	10¾	9½
Tin, Straits, cents per lb	55⅞	58½
Aluminum, 98 to 99 per cent, cents per lb	55	60

OLD METAL PRICES

	March 31	May 3
Heavy copper, cents per lb	29	24½
Light copper, cents per lb	24¾	21½
Red brass, cents per lb	20	18½
Yellow brass, cents per lb	19	17½
Lead, heavy, cents per lb	8	7¾
Zinc, cents per lb	8	7
Steel car axles, Chicago, per net ton	$38	$41.50
Iron car wheels, Chicago, per gross ton	$22	$24
Steel rail (scrap), Chicago, per gross ton	$27.50	$31.50
Steel rail (relaying), Chicago, per gross ton	$34	$39
Machine shop turnings, Chicago, per net ton	$9.50	$11.00

CURRENT PRICES FOR MATERIALS

	March 31	May 3
Rubber-covered wire base, New York, cents per lb.	42	36½
No. 0000 feeder cable (bare), New York, cents per lb.	42	36½
No. 0000 feeder cable stranded, New York, cents per lb.	39¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	39½	33
No. 6 copper wire (bare), New York, cents per lb.	42	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40	$40
Rails, heavy Bessemer, Pittsburgh, per gross ton	$38	$38
Wire nails, Pittsburgh, per 100 lb.	$3.20	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.65	$3.85
Steel bars, Pittsburgh, per 100 lb.	$3.75	$4.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$4.85	$6.35
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$6.55	$7.55
I-beams over 15 in., Pittsburgh, cents per lb.	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	4.05	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.85	4.15
Cement (carload lots), New York, per bbl	$2.02	$2.12
Cement (carload lots), Chicago, per bbl	$2.06	$2.16
Cement (carload lots), Seattle, per bbl	$2.60	$2.60
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.11	$1.21
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.02	$1.22
White lead (100 lb. keg), New York, cents per lb.	10¼	10¾
Turpentine (bbl. lots), New York, cents per gal.	45	52

ROLLING STOCK

Utah Light & Traction Company, Salt Lake City, Utah, is reported to be considering the purchase of cars.

Southern Pacific Company, San Francisco, Cal., is reported to have purchased six one-man cars for its San José lines.

Georgia Railway & Power Company, Atlanta, Ga., expects to build ten new pay-as-you-enter cars of the latest type. The estimated cost of these cars is $55,000.

Springfield Street Railway and the Worcester Consolidated Street Railway, Springfield, Mass., are reported to be in the market for twenty-two cars.

Twin State Gas & Electric Company, Brattleboro, Vt., has ordered three single-truck cars from the Wason Manufacturing Company.

United Gas & Electric Corporation, New York, N. Y., noted in the April 7 issue as being in the market for sixty-five cars, has placed an order with the J. G. Brill Company for thirty cars to be distributed as follows: Twelve, Knoxville; twelve, Little Rock, and six, Birmingham. An option for the purchase of the remaining thirty-five cars for the New Orleans properties was included in the agreement.

Interborough Rapid Transit Company, New York, N. Y., noted on page 766 of the April 21 issue of the ELECTRIC RAILWAY JOURNAL as giving the details of equipment of the 477 steel subway cars ordered from the Pullman Company, specified Westinghouse control equipments for all of these cars. This detail was in error, as the order was divided equally between the General Electric and the Westinghouse companies. The General Electric Company will furnish 238 equipments of Sprague-General Electric PC-10 multiple-unit control.

Oklahoma City (Okla.) Railway, noted in the April 21 issue as ordering ten single-truck cars from the American Car Company, has specified the following details for these cars:

Number of cars ordered	10
Type	Closed motor car
Seating capacity	32
Length over bumpers	32 ft. 4 in.
Length over vestibule	31 ft. 4 in.
Width over all	8 ft. 5 in.
Rail to trolley base	10 ft. 9¼ in.
Body	Semi-steel
Interior trim	Dark bronze finish
Headlining	Agasote
Roof	Arch
Axles	Brill
Bumpers	American Car—Channel iron
Car trimmings	Brill
Curtain fixtures	Curtain Supply
Curtain material	Pantasote
Door mechanism	Safety Car Devices Co., air operated
Paint	To be painted by railway
Hand brakes	Furnished and installed by railway
Headlights	Furnished and installed by railway
Journal boxes	Brill
Sanders	Brill Dumpit at diagonal corners
Sash fixtures	O. M. Edwards
Seats	12 Brill Winner reversible and 4 stationary
Seating material	Birch wood
Springs	Brill
Step treads	Feralun
Trucks, type	Brill 21-E
Ventilators	Six Brill exhaust per car
Wheels	33 in.

Puget Sound Traction, Light & Power Company, Bellingham, Wash., noted in the issue of March 24 as ordering ten light-weight cars from the St. Louis Car Company, has specified the following details for this equipment:

Number of cars ordered	10
Builder	St. Louis Car
Type	Light-Safety
Seating capacity	30
Weight (total)	13,000 lb.
Length over bumpers	27 ft. 9½ in.
Length over vestibule	26 ft. 9½ in.
Width over all	7 ft. 10 in.
Body	Semi-steel
Interior trim	Mahogany
Headlining	Carline finish
Roof	Plain arch
Air brakes	Westinghouse
Car trimmings	St. Louis Car
Control	Type GE, K-10
Couplers	Bar type, St. Louis Car
Curtain fixtures	National Lock Washer
Curtain material	Pantasote
Designation signs	Hunter
Door mechanism	Safety Car Devices Co. air operated
Fenders or wheelguards	H. B.
Hand brakes	Blackhall drop handle
Heaters	Peter Smith electric truss plank
Headlights	Golden Glow
Journal boxes	3 in. by 6 in. plain bearing
Motors	Two GE 258-A
Motors	Inside hung
Paint	Painted and varnished
Registers	International
Sanders	Nichols-Lintern
Sash fixtures	O. M. Edwards
Seats	St. Louis Car Co.'s light-weight stationary
Seating material	Rattan inserts
Step treads	Feralun
Retrievers	Ohio Brass
Trucks	St. Louis Car lightweight solid forged, single
Ventilators	Utility
Wheels	24 in. chilled iron

Northern Texas Traction Company, Fort Worth, Tex., has specified the following details for fifteen double-end pay-as-you-enter one-man safety motor cars, which are being built by the American Car Company:

Number of cars ordered	15
Type	One-man safety car
Seating capacity	34
Length over bumpers	27′ 9½″
Length over vestibule	26′ 9½″
Width over all	8′ 0″
Rail to trolley base	12′ 6″
Body	Semi-steel
Interior trim	Statuary bronze
Headlining	None, rafter finish
Roof	Arch
Air brakes	Safety Car Devices Co.
Axles	Brill
Bumpers	American Car-channel iron
Car trimmings	Brill
Couplers	None—Pull bars used
Curtain material	Pantasote
Designation signs	Hunter
Door mechanism	Safety Car Devices Co., air operated
Hand brakes	American Car with Pittsburgh ratchet drop handle
Headlights	Golden Glow S-M-95
Journal boxes	Brill
Sanders	Keystone air sanders
Sash fixtures	O. M. Edwards
Seats, style	Heywood Bros. & Wakefields 57-S-P
Seating material	Mahogany wood, steel and canvas-lined rattan
Springs	Brill
Step treads	Feralun
Trolley catchers	Keystone
Trucks, type	Brill 78-M-1 Special
Ventilators	Utility
Wheels	24 in. diam., 2½ in. tread, ⅝ in. flange
Special devices	Faraday high voltage push button system

Tacoma Railway & Power Company, Tacoma, Wash., noted in the April 28 issue, page 809, as giving the details of equipment for twenty-eight single-end, one-man cars, specified American Car Company's door-operating mechanism instead of Safety Car Devices Company's air-operated mechanism.

TRADE NOTES

National Conduit & Cable Company, New York, N. Y., has changed the location of its Chicago office from 72 West Adams Street to the Rookery.

Charles M. Crofoot has been transferred from the post of district sales manager of the Cincinnati office to the New York City office of the Crouse-Hinds Company.

Atlantic Insulated Wire & Cable Company, New York, N. Y., announces the removal of its general sales office from 120 Liberty Street to the Vanderbilt Concourse, 52 Vanderbilt Avenue, New York City.

Verne W. Shear & Company, Akron, Ohio, sales engineers, have established a branch office in the Illuminating Building, Cleveland, Ohio, in charge of Bon J. Ballard, formerly with the H. W. Johns-Manville Company.

Safety Car Devices Company, St. Louis, Mo., has received an order for two sets of its air-brake and safety control equipment from the Massachusetts Consolidated Railways, Greenfield, Mass.

Railway Improvement Company, New York, N. Y., announce that its coasting recorders are being installed on all of the cars of the Houghton County Traction Company, Houghton, Mich., and the Cape Breton Electric Company, Ltd., Sydney (N. S.) Canada.

H. A. Howard, for many years connected with the C. & C. Electric Company, and until recently associated with the Diehl Manufacturing Company, has been appointed manager of the New England office of the C. & C. Electric & Manufacturing Company.

John C. Dolph Company, Newark, N. J., manufacturer of insulating varnishes, announces that the Dolph Manufacturing Corporation of 39 Cortlandt Street, New York City, has been appointed general sales representative of the company and all sales will be handled through this corporation hereafter.

Dr. W. F. M. Goss has resigned as dean of the College of Engineering, University of Illinois, to take up the duties of president of the Railway Car Manufacturers' Association. Temporarily he will be located at the office of the association, 1120 Frick Building, Pittsburgh, Pa.

C. H. Holden has been made central district manager for Edwards & Company, Inc., New York City, and has established a sales office at 9 Clinton Street, Chicago, Ill. Mr. Holden was formerly sales manager for the PR Manufacturing Company, and has had long experience in the sale of electrical specialties.

T. F. Webster, for twenty-five years associated with the Link-Belt Company and for the last twelve years manager of its Pittsburgh office, has resigned to become vice-president of the R. H. Beaumont Company, Philadelphia, builder of conveying and hoisting systems. Mr. Webster will be identified with the sales department.

Barron G. Collier, of Barron C. Collier, Inc., on behalf of the street car advertising operators, has offered to Secretary of the Treasury McAdoo the free use of one card in a campaign which will cover the whole United States. This offers an opportunity for the government to use without expense excellent advertising space in more than 35,000 cars throughout the country for the display of notices in regard to the sale of the new bonds or any other purpose desired by the government.

C. W. Forbrich, Western manager of the *Electrical Review and Western Electrician* since 1908, has resigned his position and formed the Forbrich-Burton Advertising Service, Inc., Monadnock Block, Chicago, Ill. J. H. Burton, who was formerly connected with the *Western Electrician*, has been in charge of the service department of *Practical Engineer* for the last few years.

Underwriters' Laboratories, New York, N. Y., announces that on May 1, 1917, the New York office and testing station of the Underwriters' Laboratories will be moved from 135 William Street and 92 Vandam Street to the twelfth floor of the Evening Mail Building at 25 City Hall Place, where increased space and the location of offices and laboratories in the same building will afford improved facilities for the conduct of its work.

ADVERTISING LITERATURE

National Lamp Works of the General Electric Company, Cleveland, Ohio, is distributing bulletin 28, descriptive of show window lighting.

Diamond Power Specialty Company, Detroit, Mich., has issued bulletin 125 on the application of its Diamond soot blowers to the boilers of the Babcock & Wilcox Company.

Westinghouse Church Kerr & Company, New York, N. Y., are distributing a bulletin, "Only a Week's Interruption by Fire," in which the ability of this organization to meet unexpected emergencies is illustrated.

Gold Car Heating & Lighting Company, New York, N. Y., is distributing a booklet on its thermostatic heat regulating systems. This method is described and a chart showing the even temperature obtained by its use is given.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has prepared leaflet No. 3978, descriptive of its type HB overhead relays. These relays are designed for use on high-voltage circuits, and are for indoor use, offering ample protection and sufficiently accurate time element for ordinary service.

American Steam Conveyor Corporation, Chicago, Ill., has issued a thirty-two page booklet giving a general description of American steam jet conveyors showing detailed views of the fittings used in this system, blueprints illustrating the system installed in different parts of power plants, and photographs of numerous central station and industrial plant installations of the system.

General Electric Company, Schenectady, N. Y., has issued bulletin 58329A on frame parts and grids for type IG resistors. It has also issued bulletin 44406A on GE-247 ventilated commutating pole railway motor. This 40-hp. motor is built in forms suitable for trucks with wheels 24 in. in diameter and is, therefore, well adapted both in characteristics and design for low-floor cars and for a considerable range in types of light and moderate-weight cars operating under all conditions of city service.

Electric Service Supplies Company, Philadelphia, Pa., has just issued a new and very comprehensive catalog on "Golden Glow" railway headlights and projectors. This catalog includes a complete line of dimming and main resistances, switches and other headlight accessories necessary for use in connection with railway headlights. This is a sixty-four-page book printed in two colors, and in producing it much effort has been expended in duplicating in appearance the different headlights. It was found particularly difficult to illustrate with printers' ink the "Golden Glow" reflector, which is of a greenish-yellow color.

Canton Culvert & Silo Company, Canton, Ohio, has recently issued a pamphlet containing abstracts from the company's files that indicate the popularity and adaptability of the company's nestable corrugated No-Co-Ro metal culverts. A feature of the pamphlet is a letter from the Union Traction Company of Indiana in which it is said that the results obtained with these culverts during three years of use indicate that deterioration is not likely to commence for many years. Another letter from the Kanawha Traction & Electric Company, Parkersburg, W. Va., states that culverts of this type installed during the summer of 1909 showed no signs of corrosion or failure in November, 1916.

New Publications

Government Telephones. By James Mavor. Moffat, Yard & Company, New York, N. Y. 176 pages. Cloth, $1 net.

In this book Mr. Mavor, who is professor of political economy in the University of Toronto, relates in detail the fatal weaknesses of government ownership as illustrated by the experience of the Province of Manitoba with telephones. The author charges that the management has been uneconomical, the enterprise handicapped by political intrigue, the finances unsoundly administered and the obligations of the public increased without adequate compensatory advantages. The book seems to be a careful attempt to uncover the facts of an interesting experiment, and as such is a valuable contribution to the general discussion on government ownership.

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HIGHER FARES ARE NOW NECESSARY

"How do the public service corporations manage to maintain the old prices when the ice man, the coal dealer, the dairy man, the doctor, lawyer, merchant and chief all are boosting the prices of their own wares?" In the face of the admitted increase in public utility expenses, it is no wonder that the St. Joseph (Mo.) *Gazette* recently asked editorially the foregoing question. The paper did not present any answer, but only one would have been possible. Continuously rising costs, with prices rigidly fixed, can be met only by forcing economies beyond the demands of efficiency and suppressing development below the demands of the public. That is how the electric railway industry has been able up to this time to continue operation under the old price of a nickel. But with all costs still on the upward march, a limit has been reached, and the present seems logically the time to increase fares. The issue came to the front in New York this week through publication that at least one electric railway company in New York City had held informal discussions with the Public Service Commission, First District, in regard to higher fares and also through an address on the subject by President Loree to the stockholders of the Delaware & Hudson Company at the annual meeting of that corporation. In this address Mr. Loree, in referring to the situation on the trolley roads owned by that company, said that an abolition of the pavement charges would help greatly, but he also suggested as the two main methods of increasing revenue, a charge for transfers, and a 6-cent fare. We are inclined to favor the last-named method as a general solution, for we feel that the popular idea of having the nickel as a fare limit should be thoroughly killed. The problem is big, and it demands a big solution.

WOMEN CONDUCTORS A POSSIBILITY?

Even if we had not the experience of Canada as well as of the European countries to guide us, it would be possible to say with certainty that, if the United States Government is ever able to stop talking and get the country on a war footing, a distinct shortage of labor will confront the electric railway industry. To meet this the most obvious possibility in the train service seems now to be the employment of women conductors. Clearly enough, the plan, according to experience in Great Britain, is practical and, as a means for releasing men for other services in case that necessity arises, is unquestionably effective. Of course there are difficulties in the way, such as the conservatism of the public and the necessary reorganization of the service and operating practice to make provision for woman's inferior strength and endurance. Nevertheless, this latter feature is not of great import where modern prepayment features and fully-inclosed vestibules are installed on the cars, and since opposition to such a change cannot be insurmountable where a real need for it exists, we feel that the experiment might well be tried out where existing circumstances permit a reasonable chance for its success. Certainly the conductor on a modern car is little more than a change clerk, and it seems only logical that women, whose adaptability for this kind of work has been amply demonstrated in other businesses, should be employed for the purpose by electric railways.

TRUCK GARDENS ON RIGHT-OF-WAY INVOLVE RISK

In the present general movement to lease out railway right-of-way for truck gardening purposes, certain risks are involved which should be guarded against by the companies granting the lease right. Basically, the movement is a most commendable one and in harmony with the war-made necessity for increasing our production of foodstuffs. The railways are doing well to grant this privilege with as few restrictions as practicable. However, the practice does tend to reduce the railway's control of its right-of-way, since it encourages trespassing—an always dangerous and wisely-prohibited act. Hence, while we believe in railways acting in accord with patriotic incentive, they should also protect themselves against the possibility of any resulting serious accidents which would incur a liability to the company and a loss to the community entirely incommensurate with the good to be gained. Precaution should be made against this danger by a clause, prominently inserted in the lease, calling attention to the risks involved by proximity to railway track and absolving the company from responsibility should the lessee meet with personal injury or property damage in the course of his agricultural pursuits. In addition it would be well to follow the example of those railways which have required that no corn or high-growing plants shall be permitted at any point where the view of motormen might be obscured and that no children be permitted to attend gardens located along the right-of-way. With these precautions there is nothing particularly radical about the procedure. It has been in use for a number of years by electric railways on the Pacific Coast, notably in the fertile Sacramento Valley, where the plan of leasing sections of the right-of-way at a nominal rental to farmers along the line was adopted as a substitute for planting grass to keep down dust or unsightly growths of weeds, and here it seems to have worked out satisfactorily to all concerned.

THE REAL AMERICAN AUTOCRACY

We had to smile at the ridiculous analogy which the *New Republic,* in its issue of April 28, drew between the European War and the recent street railway strike in Washington, D. C. In its opinion, the supremacy of autocracy or democracy was the issue in the capital city, as it is in the present world conflict. You wonder how! Listen. The Washington Railway & Electric Company, confronted with a demand from its Amalgamated Association employees for a "closed shop," dared so far forget American democratic principles as to offer attractive individual contracts to its loyal employees. This awful display of autocratic power, which has resulted in normal operation under a partly new but wholly satisfied organization, is "an outrage," it is said, "a vital blow to the future of industrial democracy."

Now, liberty and democracy are glorious words, but we insist that they ought not to be used to justify the unbridled license which destroys freedom—in other words, that license which robs some of their freedom to use their capital in a legitimate business enterprise; others of their freedom to ride at their convenience on a public carrier, and still others of their freedom to work and make individual contracts. There are many people in this country who do not yet fully realize that individual liberty does not mean liberty to tyrannize over others. Labor leaders especially are blind to the fact that others have rights as well as themselves, and some of them, with the arrogance that betrays the real autocratic leader, have loudly insisted that they belong to a privileged class. Yet all such penny imitators of the Kaiser may well pause and ponder, for world events now show, as never before, that privileged classes must go.

The *New Republic* alleges that the power of the Washington company to enforce its autocratic will against its disorganized employees is absolute, "for any attempt at collective action on the part of the men, for the redress of any grievance whatsoever, would not only make them liable to immediate discharge for insubordination, but would also expose them to legal prosecution." The fact is, however, that the individual agreement signed by the Washington employees provides for an "open-shop" and for the presentation of grievances on stated days to the superintendent, with an appeal to the president and finally to the Public Service Commission. The matter of discharges can also be carried up similarly to the commission for final determination. The only restrictions are that the men shall present complaints in person or through a committee of employees, and that there shall be no strike action, although single employees may leave the service peaceably.

These provisions constitute no attack upon personal freedom in so far as it is compatible with public welfare. The company retains the right of discipline, which is necessary for efficient operation. On the other hand, the employees are protected from discharge without cause; they can approach the company collectively, through their own committees, and they can seek other employment, if they as individuals so desire. But, and to the *New Republic* this seems the unpardonable sin—they agree not to suspend service collectively in disregard of the paramount public interest.

"For the sake of decent and harmonious industrial relationships, which have such critical importance to the nation at this time," to use the magazine's own words, we hope that our contemporary will read the Adamson decision and then devote a little energy toward helping labor to see that it is part of the public, and not *vice versa.* We do not look upon the individual working agreement as a perfect instrument for bringing industrial peace, but it is useful means to a worthy end. For it is quite possible that its wider use may put labor in a more receptive mood for wage fixing by scientific methods rather than by brute force.

SELECTING LINE INSULATORS

As line voltages have increased with the development of electrical transmission the insulator has been the element of greatest weakness and has, therefore, been the cause of greatest anxiety on the part of manufacturers and operators. The end is not yet in sight, either, but progress is being made. The "liveness" of the subject is indicated by the attention being given to it by the electrical engineers. A whole session of the coming convention of the A. I. E. E., to be held at Hot Springs, Ark., will be devoted to four papers on high-tension insulators and the accompanying discussion. Two of these appear in the May issue of the *Proceedings,* and show clearly what the present problems are in general and in detail. An important paper on insulator testing was read at the December meeting of the same association.

In the pioneer days of power transmission development selecting line insulators was very much like buying hats at a cross-roads general store. If the desired style and size were available everyone was happy. If not, the purchaser did the next best thing and took what he could get. The selection was perforce easy. Since that time, however, the duty of the insulator has been made the subject of scientific investigation, and equally careful studies have been made as to the methods of selecting the proper type of insulator for a given duty. Tests have been devised for the purpose of detecting faulty parts while the insulator is in process of manufacture and also for the purpose of determining the relative efficiency of different types or designs. Various technical societies have done notable work both in carrying on active investigations and in securing the co-operation of experts in the insulator field. They have proposed standard specifications which are valuable as a guide in the selection of new insulators for a given service.

The selection problem, as it interests the electric railways, is to a great extent that of selecting new insulators for replacing broken down or otherwise defective ones. While not as simple as it once was, the whole process has been placed upon a more scientific basis, and properly selected new insulators should give much better service than did the old ones which they replace. The selection process itself, in most cases, is somewhat simplified by the fact that the line supports admit of the use only of the pin-type insulator. With the physical and electrical characteristics of the line known the mechanical and electrical stresses which the insulators must withstand can be pretty definitely predetermined. Climatic conditions usually have much to do with the choice of petticoat shapes. With these conditions known, and the desired electrical and mechanical characteristics either calculated or determined by actual test, the final process in the problem is the mating of these requirements with a commercial type of insulator. The very complete data furnished nowadays by reputable insulator manufacturers relative to their various types of insulators greatly facilitate the mating process.

In making replacements there seems to be considerable tendency to use better insulators than were those being replaced. It is quite true that the promiscuous mixing of the newer and stronger insulators with the older ones may hasten the retirement of the latter. Despite this fact, however, we believe that the policy of using a higher grade of insulators for replacement work is, at least as far as the older types are concerned, a good one, for on a live railway both the duty imposed on insulators and the demands as regards standards of service are increasing.

RETIRING THE VETERAN POWER PLANTS

We are giving a prominent position and much space in this issue to a new power plant of small immediate size because it is typical of the metamorphosis through which the power plant, considered as a species, is going at the present time. The old-time, slow-going but sturdy engine is giving place to the humming turbine, much to the benefit of the coal pile. At the same time improved condensers, boilers, furnaces and auxiliaries are being substituted for less efficient types, while labor-eliminating devices are producing savings commensurate with those accomplished along the lines of fuel and water saving. All of these things are illustrated in the New Haven plant under discussion this week.

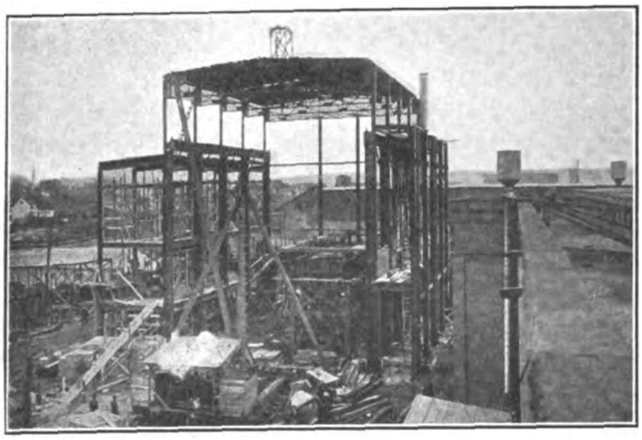
This station is also of unusual interest as an example of what can be done in the way of rapid construction, even in times of slow delivery, when the utmost is made of available resources. So rapid has been the progress in turbine and auxiliary design that the installation of second-hand equipment is economical only under unusual conditions. In this the minimum steam consumption is about 16 lb. per kilowatt-hour whereas a modern turbine would use, say, 20 per cent less steam. To offset this difference, however, there is the lower cost of the unit and the promptness with which it could be obtained. Tests already made in the new plant indicate a unit coal consumption of about 2.5 lb. per kilowatt-hour, the coal running from 14,000 to 14,200 B.t.u. per pound. As 1 B.t.u. is the equivalent of 0.293 watt-hour this 2.5 lb. would produce from 10.2 to 10.4 kw.-hr. if there were no loss in transformation. The efficiency of the plant from coal pile to switchboard is, then, about 9¾ per cent, or in round numbers 10 per cent. This will be recognized as a creditable showing when one considers that the turbines and condensers are far from modern, that the generating unit is not yet economically loaded, and that the plant as a whole is new.

TACT NEEDED IN INTRODUCING ONE-MAN CARS

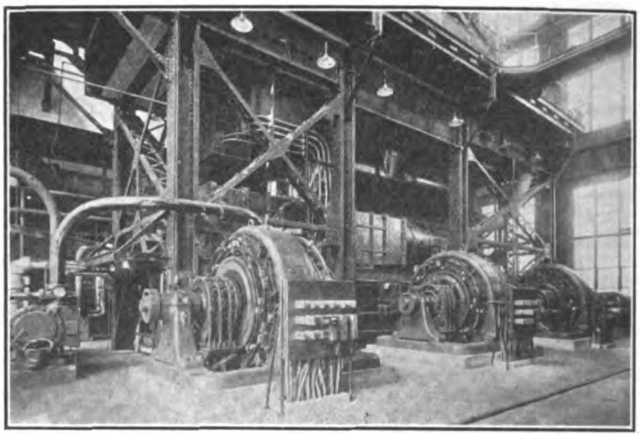
The experience of some operating companies in the introduction of one-man cars emphasizes the importance of bringing forward such equipment in a tactful way with respect to all interested parties. The design of the one-man or "safety" car, as it has well been called, appears radical to some municipal authorities and has been known to arouse an entirely unjustified opposition on the part of the public when reports have been spread abroad in the daily press that a revolution in rolling stock is under contemplation. Labor interests, too, have come forward in some cases to oppose the introduction of one-man cars on the ground that their use threatens the permanency of employment of the men on the existing transportation payroll.

Within certain fields, which are well understood by many operating men, this type of car is definitely proving its usefulness. But in such places it has been more successful when used primarily to increase the gross receipts by giving a more frequent service rather than to decrease the operating expenses through a reduction of the transportation force. For war conditions, it is true, when additional labor is difficult to obtain, the one-man car would appear to be exceptionally well adapted for moderate or light traffic routes, but in most cases the natural growth of traffic should banish fear on the part of the trainmen that their tenure of employment will be jeopardized. The situation is not unlike that in the central station field when the tungsten lamp first made its appearance in that the new product greatly increased the popularity of electric service in competition with older forms of illumination and resulted in a largely increased use, despite the early and ungrounded fears of some central station managers that only the same amount of light would be used.

Since the exact field of usefulness of the one-man car on many properties must be demonstrated by experience, the installation of such units in small groups without elaborate advance publicity appears a wise policy. Many critics of the one-man car have never seen it in service, much less ridden in one. To acquaint the public officials with actual service performance in neighboring cities or towns will prove helpful through personal demonstration when such a course is feasible, as thereby opposition will be disarmed well in advance of the appearance of a few trial units on the streets. Such opposition may be aroused by present hostility based upon entirely mistaken notions that the introduction of the new service means less service for the public. Let the one-man car tactfully feel its way, and we are convinced that it will become increasingly popular in the field of its economic usefulness.



CONNECTICUT COMPANY POWER PLANT—CONSTRUCTION VIEW SHOWING FRAMING OF BUILDING AND TURBINE FOUNDATION



CONNECTICUT COMPANY POWER PLANT—VIEW IN TURBINE ROOM SHOWING TURBINE SUPPORT, CONDENSERS AND ROTARY CONVERTERS

Connecticut Company's Power Plant

The New Grand Avenue Plant Is Being Superimposed on the Old One Without Interruption to Service—The Design Has Been Complicated by Market Conditions Which Have Made Necessary the Adaptation of Some Second-Hand Equipment

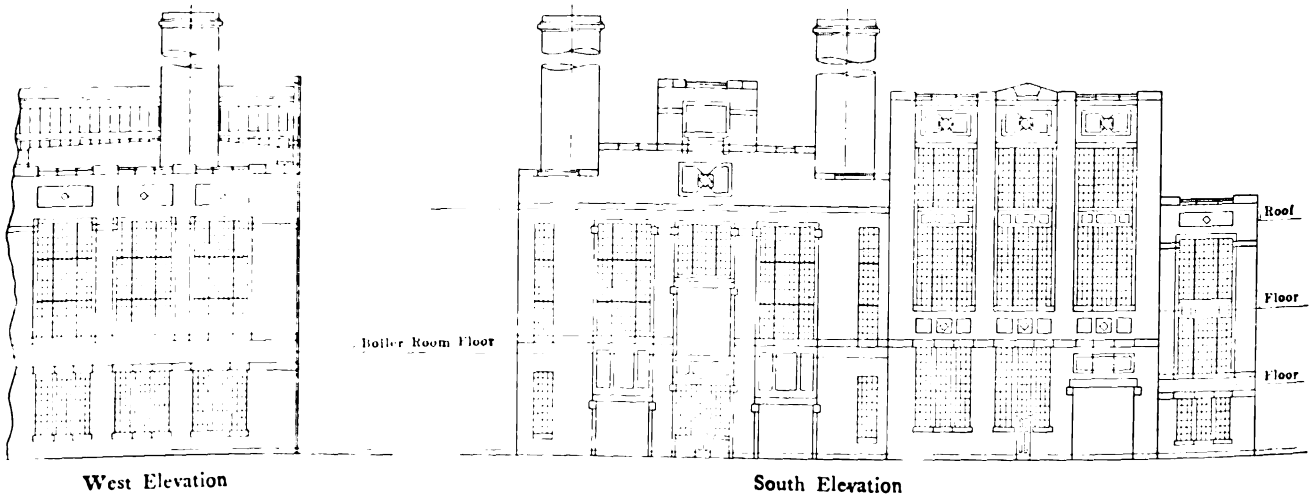
FINDING itself short of power, particularly for the needs of the New Haven division at the moment, the Connecticut Company decided a year or more ago to remodel its Grand Avenue steam plant in New Haven. It would be more accurate to say that it was decided to retire the old plant as rapidly as possible, substituting for it one of modern design and using only such of the existing equipment as was strictly modern. As the engineering staff of the company was fully occupied with its operating problems, unduly heavy on account of the extra traffic due to the munitions business in its territory, the J. G. White Engineering Corporation was called in to design and supervise the construction of the first unit of the new plant. The design and construction were pushed rapidly during the summer, fall and winter, and the work is now practically completed.

SOME SECOND-HAND EQUIPMENT HAD TO BE USED

On account of market conditions it was necessary to purchase some second-hand equipment and to work this into the scheme so that eventually it could be replaced with larger and more modern apparatus without interfering with the logical development of the plant. While providing for immediate power requirements, the new plant was designed as one section of a power station of 100,000-kw. capacity or more, laid out economically to use the entire available site. The layout of the complete plant as tentatively outlined is shown in an accompanying simplified drawing, on which the first unit is indicated by solid lines. To avoid confusion the parts of the original plant which will be retained for the present are omitted. The earlier plant formed the basis of an illustrated article in the issue of the ELECTRIC RAILWAY JOURNAL for March 3, 1906, page 338. At that time it had been in operation for about twelve years, but since the article was published there have been some additions to the equipment, particularly in the boiler room. In the present article, however, attention will be focussed on the new part of the plant.

THE COMPANY IS LOOKING TO THE FUTURE

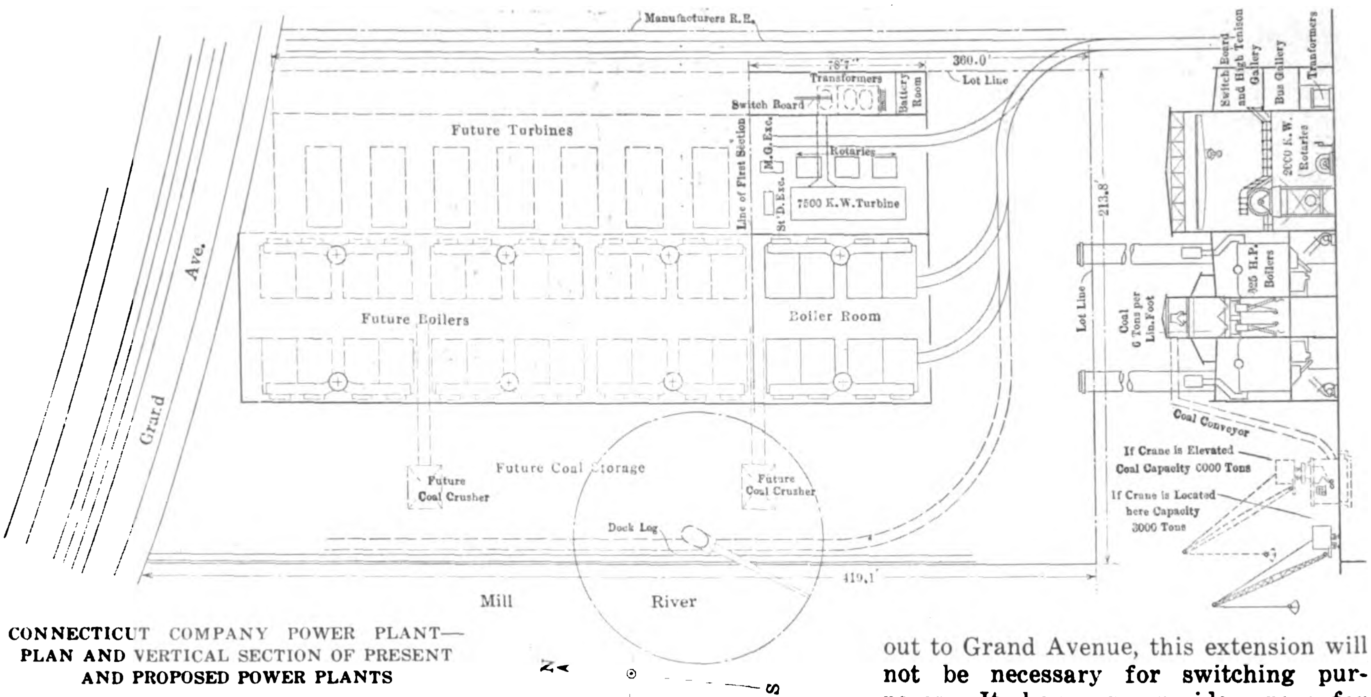
In a study of this plant, as projected and as already completed, it must be borne in mind that the problem



West Elevation

South Elevation

CONNECTICUT COMPANY POWER PLANT—ELEVATIONS OF BUILDING, SHOWING GENERAL ARCHITECTURAL TREATMENT OF DETAILS


Manufacturers R.R.
78'7"
300.0'
Transformers
Battery Room
Lot Line
Switch Board
Future Turbines
Line of First Section
M.G. Exc.
St'D. Exc.
Rotaries
7500 K.W. Turbine
213.8'
Future Boilers
Boiler Room
Grand Ave.
Future Coal Storage
Future Coal Crusher
Future Coal Crusher
Dock Log
Mill River
419.1'
N
S
Lot Line
Coal 6 Tons per Lin. Foot
Switch Board and High Tension Gallery
Bus Gallery
Transformers
2000 K.W. Rotaries
525 H.P. Boilers
Coal Conveyor
If Crane is Elevated Coal Capacity 6000 Tons
If Crane is Located here Capacity 3000 Tons

CONNECTICUT COMPANY POWER PLANT—PLAN AND VERTICAL SECTION OF PRESENT AND PROPOSED POWER PLANTS

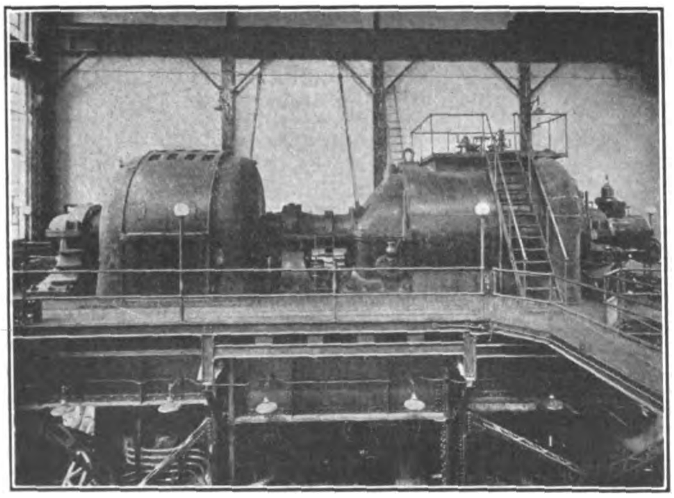
was to provide an immediate power supply, and at the same time to allow for future expansion at minimum expense. The first unit was also to contain a substation for local demands for direct current. The ultimate plant, of course, will furnish power over a large territory, so that the first unit was designed to tie in with a general distribution and generating system.

The proposed complete plant layout shows the first unit to differ considerably in plan from those which are to follow. The reasons for this are as follows: The second-hand 7500-kw. Westinghouse turbine purchased for this unit is longer than more modern turbines even of much greater capacity; hence it was placed lengthwise with the building. It was considered probable, also, that it would be desirable to replace this machine with a 30,000-kw. unit as local demands for power increased, and the supporting structure was designed to this end. Further, the longitudinal arrangement of the turbine provided a convenient spacing of the rotary converters, which will not be required in the later units. This arrangement of turbine and rotaries permitted the laying of a railroad track into and through the turbine room, greatly facilitating construction and repair. The switchboard bay containing three galleries is a feature of the first unit, and, while the plan shows it extended out to Grand Avenue, this extension will not be necessary for switching purposes. It, however, provides space for larger turbines than those shown in case changes in plan make the use of such turbines desirable, and for transformers which may be required for stepping up the voltage for power transmission to distant points.

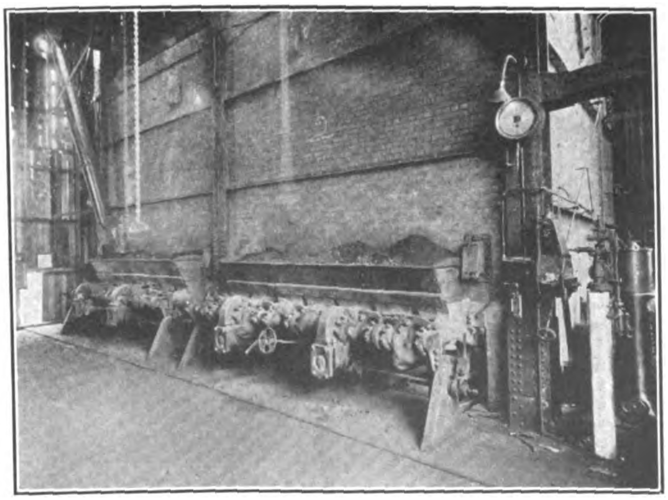
ACCESSIBILITY IS CONSPICUOUS IN THE TURBINE ROOM

On entering the turbine room one is struck by the location of the turbine high in the air, its base being 27 ft. above the floor. It was so located to permit all accessories to be practically above floor level, and to provide space for a much larger future condenser. The steel turbine foundation consists of an eight-column, diagonally braced frame carrying deep plate girders at the top. It is strong enough for a modern 30,000-kw. unit. This, of course, would not be proportionately heavier than the present 7500-kw., 25-cycle, 750-r.p.m. machine, which weighs about 715,000 lb., as it would be of higher speed and modern design. The turbine is now running on its elevated support with very little vibration, which is least at heaviest load.

A walkway around the base of the machine is bracket supported and floored with checkered steel plate. It connects by a bridge with the switchboard gallery and will ultimately join on the same level the walkway around

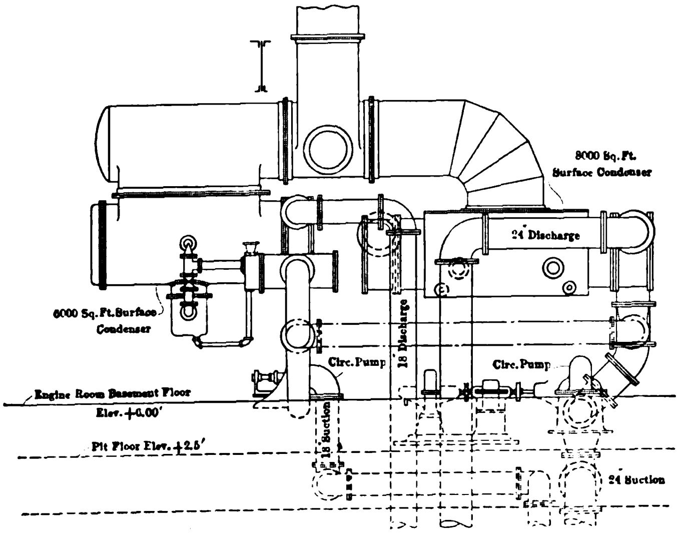


CONNECTICUT COMPANY POWER PLANT—7500-KW. TURBINE AND GENERATOR



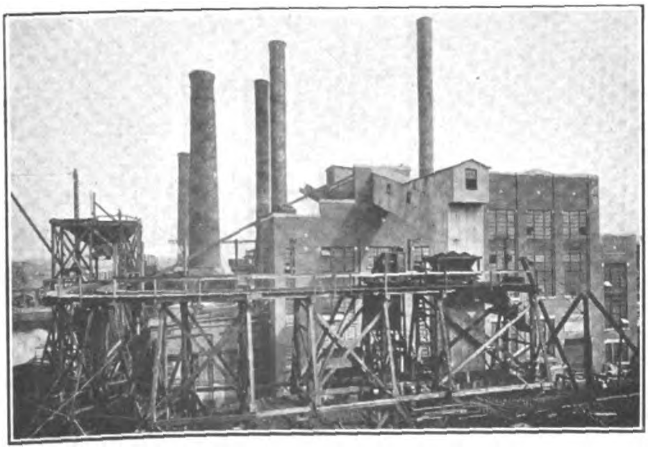
CONNECTICUT COMPANY POWER PLANT—BOILER FRONTS WITH STOKERS AND SPOUT LEADING FROM WEIGHING LARRY the contiguous turbine unit. The bridge was made removable to provide clearance in moving heavy pieces. In the turbine room is a 50-ton, motor operated Shaw crane, powerful enough to handle any part of the present or prospective equipment safely and expeditiously.

At present two condensers are used for the one turbine, a temporary expedient due to the impossibility of obtaining a single condenser in reasonable time. Both condensers are of the surface type, Worthington make, one having 8000 sq. ft. and the other 6000 sq. ft. of condensing surface. A drawing is reproduced to show how the piping arrangements were worked out for this unusual case. Like the turbine, the condensers were purchased second hand. The larger one was originally a four-pass base condenser and it was changed to two-pass; the other was of the side-bottom inlet type, but in adapting it to the present location the shell was turned, making a side-top arrangement. The exhaust connections were made of steel plate because cast iron could not be procured in reasonable time.

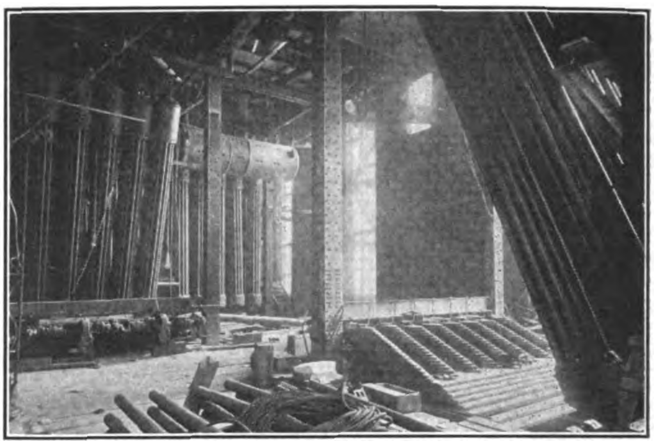


CONNECTICUT COMPANY POWER PLANT—ELEVATION OF CONDENSERS AND PIPING

The turbine foundation rests upon the 2-ft. wall of the intake-discharge tunnel structure, which is 16 ft. wide outside. This structure provides a 6-ft. x 12-ft. discharge tunnel above and an intake tunnel of the same size below. It in turn rests on a pile-supported, heavy concrete cap. The soil is light in texture and is saturated with water below tide level, necessitating unusually substantial footings. In this case wood is used for the piles, as they are continuously below tide water. In other parts of the building Raymond concrete piles are used wherever the piles project above low-water level.



CONNECTICUT COMPANY POWER PLANT—SOUTH AND WEST SIDES OF BUILDING, SHOWING TEMPORARY COAL-HANDLING EQUIPMENT

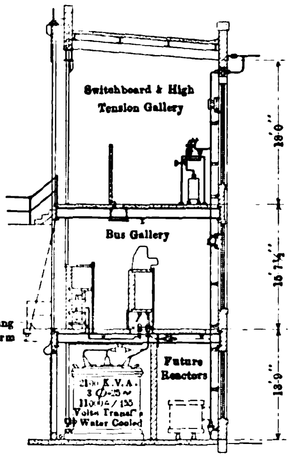


CONNECTICUT COMPANY POWER PLANT—CONSTRUCTION VIEW IN BOILER ROOM

BOILER ACCESSORIES ARE LARGELY IN THE TURBINE ROOM

In space projecting under the boiler room and opening into the turbine room are located most of the turbine and boiler auxiliaries, including the two steam-driven stoker fans, the feed-water heaters, the dry vacuum pump and the boiler feed pumps. This arrangement places all of the steam machinery of the plant together and within easy reach of the turbine-room attendants. The boiler-room auxiliaries are thus away from the dust of the boiler room, and can have better attention than would be possible otherwise. At the same time these auxiliaries are as close to the boilers as they could well be placed. The feed-water heaters mentioned above are of National make, two in number, each large enough for the present plant capacity. They are equipped with Bailey V-notch meters, which with the coal-weighing larry, referred to later, permit the keeping of accurate boiler-room records.

The boiler section of the new plant contains eight Hornsby-Biglow boilers, set high enough above ground level to permit railroad cars to be pushed directly under the ash hoppers. The boilers are rated at 625 hp. and they are furnished with Taylor stokers to permit forcing to 250 per cent of rating. In each is a superheater of a size to produce 100 deg. Fahr. superheat at maximum load. Air is furnished by the two steam-driven blowers already mentioned and a motor-driven



CONNECTICUT COMPANY POWER PLANT—CROSS-SECTION OF TRANSFORMER AND CONTROL GALLERIES IN TURBINE ROOM one on the side of the boiler house away from the turbine room. A cross-section of the boiler room is reproduced, which, with the accompanying halftones, will serve to show its salient features.

The stokers have the new steam-operated dumping plates by means of which the ashes can be dumped in a half minute or less, without affecting the boiler pressure. The plates are controlled by levers at the side of the boiler, so placed that a full view of the dump plates can be had during the dumping operation if this is desired.

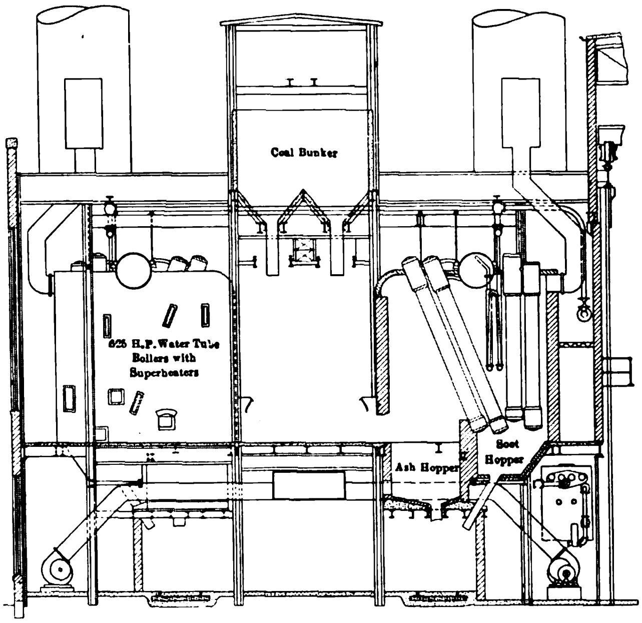
For the present the steel stacks of the old plant are being used, but each battery of four boilers will eventually have its own steel stack, of 13 ft. 8 in. internal diameter, the flue diameter inside the brick lining being 9 ft. 10 in. These with the flue breechings will rest on the roof, with risers from each boiler passing upward through the roof.

PRESENT AND FUTURE PROVISIONS FOR COAL HANDLING

The coal and ashes handling problem in this plant is a comparatively simple one, owing to the ideal location of the site with respect to steam railroad and water connections. The details of this matter for the complete plant have not yet been worked out, but suggested plans are shown in the drawing first referred to. That shows a locomotive crane traveling on a track along the Mill River dock, either skirting the edge of a storage pile to occupy the space between the power house and the dock, or on an elevated structure above the storage space. The track will connect with the Manufacturers' Railroad, which in turn furnishes connection with the New Haven Railroad. Eventually there will probably be two elevator conveyors which will take the coal from storage to the overhead bunkers.

For some time, however, the very satisfactory, although temporary, coal-handling equipment which appears in one of the accompanying halftones will continue to be used. It consists of a short and considerably elevated track on a light timber trestle connecting a point on the dock with one opposite the end of the boiler room. At the dock end is an elevated hopper served with a derrick by means of which coal is transferred to it from the barges. A coal car of design special for this work has been built, as has also a simple electric locomotive for use in carrying the coal from the overhead hopper to a conveyor, which distributes it to the boiler room bunkers.

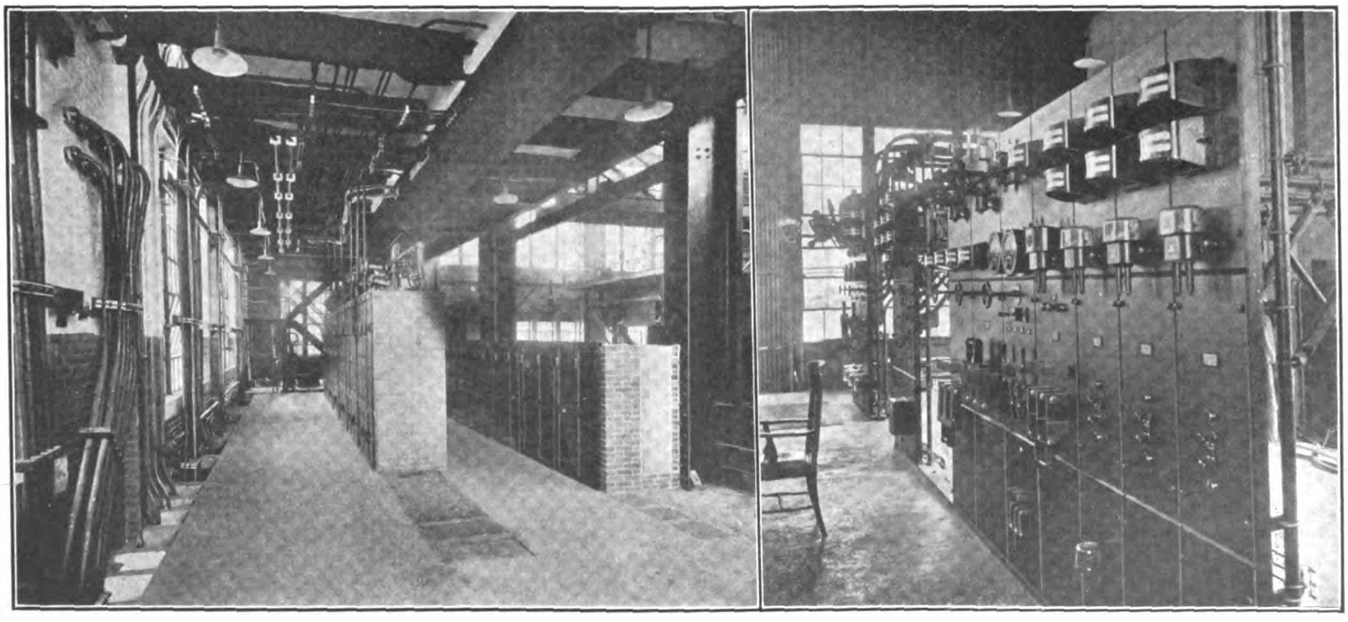
These bunkers are designed for 6 tons of coal per foot of length, the total capacity being 450 tons for the original eight boilers. Below them is a traveling weighing larry from which the coal is spouted to the stoker hoppers.



CONNECTICUT COMPANY POWER PLANT—CROSS-SECTION OF BOILER HOUSE

ELECTRICAL EQUIPMENT IS PRACTICALLY STANDARD

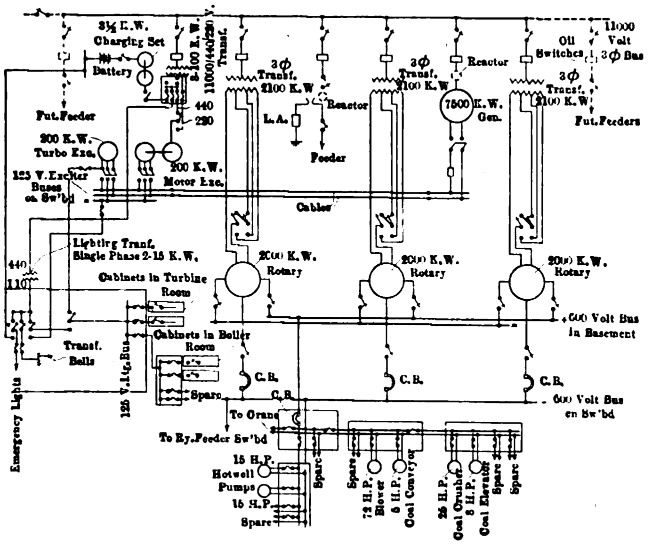
The interesting features of the electrical end of the new plant are shown in a cross-section of the gallery side of the turbine room. On the ground floor is a row of three three-phase, 11,000:445-volt, water-cooled transformers, behind which will later be placed a set of reactance coils (one of which is shown in dash lines in the drawing). Immediately over the transformers at the front are the compartments containing the flat busbars, and at the rear the motor-operated oil switches. These



CONNECTICUT COMPANY POWER PLANT—OIL SWITCH AND BUSBAR COMPARTMENTS ON MIDDLE GALLERY—ALTERNATING-CURRENT AND DIRECT-CURRENT OPERATING PANELS ON TOP GALLERY IN TURBINE ROOM are of the GE-H3 type. This arrangement provides very simple high-tension wiring on these two galleries.

The uppermost gallery contains the switchboard and horn gaps and electrolytic lightning arresters for an 11,000-volt alternating current circuit, and from it also the direct current feeders pass through bushed holes in the wall to the overhead line. The switchboard is so placed as to command a view of the entire turbine room and it is conveniently reached by the bridge from the turbine walkway.

The electrical features of the plant are summarized in the accompanying circuit diagram. On this it will be noted that, in addition to the items already mentioned, there is double provision for excitation from a 200-kw. turbine set and a 200-kw. motor set. A storage battery supplies current for oil-switch operation and emergency lighting, charged from a 3½-kw. motor-generator set. The whole plant is brilliantly lighted by tungsten lamps, and partly for decorative purposes the turbine is surrounded by lamps mounted on simple pipe standards.


3½ K.W. Charging Set
Battery
100 K.W. 11000/440/220 Transf.
440
220
Fut. Feeder
200 K.W. Turbo Exc.
200 K.W. Motor Exc.
125 V. Exciter Buses on Sw'bd
3φ Transf. 2100 K.W
L.A.
Reactor
Feeder
3φ Transf. 2100 K.W
Reactor
7500 K.W. Gen.
Oil Switches
11000 Volt 3φ Bus
3φ Transf. 2100 K.W
Fut. Feeders
Cables
Lighting Transf. Single Phase 2-15 K.W.
440
110
Cabinets in Turbine Room
2000 K.W. Rotary
2000 K.W. Rotary
2000 K.W. Rotary
600 Volt Bus in Basement
Cabinets in Boiler Room
Transf.
Bells
Emergency Lights
125 V. Ltg. Bus
C.B.
C.B.
C.B.
C.B.
Spare
600 Volt Bus on Sw'bd
To Crane
To Ry. Feeder Sw'bd
15 H.P. Hotwell Pumps
15 H.P.
Spare
Spare
Spare
72 H.P. Blower
5 H.P. Coal Conveyor
25 H.P. Coal Crusher
8 H.P. Coal Elevator
Spare
Spare

CONNECTICUT COMPANY POWER PLANT—DIAGRAM OF ELECTRIC CIRCUITS IN POWER HOUSE

As is customary in modern plants this one is supplied with many of the minor conveniences and safeguards which increase the safety and comfort of the employees or warn of abnormal operating conditions. A well-equipped wash-room with shower bath, railings at all dangerous places, stairways with wide treads, etc., are examples of this feature. An eight-station Western Electric interphone system connects all important points, a Klaxon horn being used to attract attention to a call. A soundproof booth with Klaxon signal is used in connection with outside calls. Bell signals are also provided to indicate opening of a.c. and d.c. circuit breakers, excess temperature or defective water circulation in transformers, and high and low level in the sump well.

The operation of the Rouen (France) Tramways during 1916 was characterized by two important facts—the large increase in traffic, due essentially to the economic and industrial development around Rouen, and the still greater increase in operating expenses. The increase in the price of coal alone caused an additional expense of $50,000. The operating receipts in 1916 were $877,715, as compared to $720,817 in 1915, and the total receipts in the two years were $890,348 and $740,399 respectively. The operating expenses increased from $410,078 in 1915 to $584,024 in 1916. The gross profit for 1916 was $306.324.

Committees of the Southwestern Association

In the report of the meeting of the Southwestern Electrical and Gas Association published last week the names were given of the officers elected at the meeting at Dallas. In addition, the following committees were also elected:

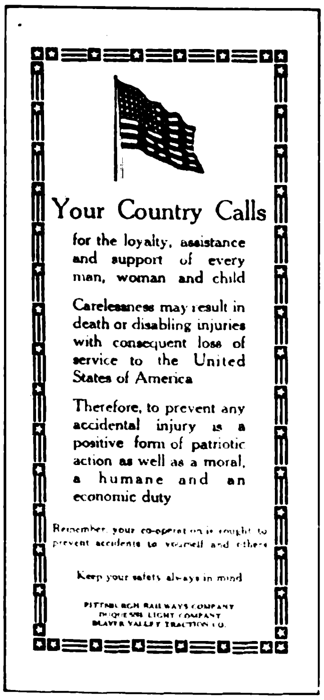
Executive committee: F. R. Slater, H. C. Morris, Burr Martin and H. S. Cooper, Dallas; D. A. Hegarty, Houston, and W. A. Sullivan, Shreveport, La. These will compose the committee with the following hold-over members; G. H. Clifford, Fort Worth; W. B. Tuttle, San Antonio; F. J. Storm, Amarillo; W. B. Head, E. S. Fletcher and R. Meriwether, Dallas; J. C. Kennedy, Brenham, and S. R. Bertron, Houston.

Advisory committee: B. F. Cherry, Weatherford; A. Patterson, Texarkana; W. W. Holden and R. C. Jones, San Antonio; F. D. Murphy and C. A. Newning, Houston; Alba H. Warren and F. M. Lege, Jr., Galveston; D. G. Fisher, James P. Griffin, R. C. Brooks, R. G. Soper, R. W. Van Valkenburgh, C. W. Davis, H. E. Hobson and F. G. Kune, Dallas; F. H. Matthes and A. V. Wainright, Abilene; R. J. Irvine, San Angelo; H. S. Potter, El Paso; J. W. Carpenter, Corsicana; J. E. Cowles, Shreveport, La.; F. N. Lawton, Wichita Falls; P. A. Rogers, Denison, and V. W. Berry, Fort Worth.

Finance committee: C. E. Calder, R. J. Soper and D. G. Fisher, all of Dallas.

Section chairmen: Light and power section, A. V. Wainright, Abilene; street and interurban railway section, Burr Martin, Dallas; gas section, K. L. Simons, El Paso.

Patriotism and Accidents



Your Country Calls

for the loyalty, assistance and support of every man, woman and child

Carelessness may result in death or disabling injuries with consequent loss of service to the United States of America

Therefore, to prevent any accidental injury is a positive form of patriotic action as well as a moral, a humane and an economic duty

Remember, your co-operation is sought to prevent accidents to yourself and others

Keep your safety always in mind

PITTSBURGH RAILWAYS COMPANY
DUQUESNE LIGHT COMPANY
BEAVER VALLEY TRACTION CO.

PATRIOTIC AND SAFETY-FIRST PAMPHLET, PITTSBURGH RAILWAYS

As a convenient record of important state papers and as a reminder that patriotism and safety-first have something in common, the Associated Bureaus of the Pittsburgh (Pa.) Railways and its affiliated companies have issued to the public the attractive twenty-four-page pamphlet (4 in. x 8½ in.) shown in the accompanying illustration.

This pamphlet contains the complete text of President Wilson's address before the joint session of Congress, when he called for the acceptance of the gage of battle with Germany. It also contains his appeal to the American people to "speak, act and serve together," and the text of his proclamation defining treason and the penalties therefor.

The cover of the pamphlet, which carries the personal application, emphasizes the fact that the prevention of accidental injuries is a patriotic action as well as a moral, humane and economic duty. A note was placed in the pamphlet to the effect that copies may be secured by addressing the Associated Bureaus.

Principles in Computing Depreciation of Plant

British Engineers Prefer Sinking-Fund to Straight-Line Method—Summary of the Conclusions Reached by the Authors

A RECENT issue of the *Journal* of the Institution of Electrical Engineers contains a paper on "Principles Involved in Computing the Depreciation of Plant," by F. Gill and W. W. Cook. This paper is an attempt to get at a first principle sufficiently sound to be worthy of general adoption for British companies, and as such will be of interest to electric railway officials in this country.

To avoid misunderstandings, the authors define "depreciation" at the outset. They interpret it as: "(1), Provision for the diminution in value of plant in place and working (that is, its loss in value to the owner as a continuing plant), by reason of causes outside his control, such as age, wear and accidents; this provision is called 'renewals.' (2) Provision to enable the owner to take plant out of commission before its physical life is exhausted in cases where, from either progress of the art or growth of the business, it is economically advisable to do so (that is, by reason of causes within his control); this provision is called 'improvements.'"

The various methods of computing depreciation charges are discussed in detail, tabular and other information being presented for each one. The following conclusions are reached:

METHODS OF COMPUTING DEPRECIATION CHARGES

"There is only one common method for the financier, the accountant, and the engineer. This common method is the best studied in the annual charges for plant, determined in advance of construction. To determine the amount in the annual charges for depreciation it is necessary to estimate the first cost, residual values, and the physical and economic lives of the various classes of plant. It is also necessary to fix the treatment of the capital account and to estimate the charge for return on capital. The interest to be earned by the reserve funds must be credited to its source.

"The reserves are preferably handled by means of two funds, as follows: (a) A renewals fund for providing the necessary money at the end of the physical life; that is, the end of the period during which the plant will give its service satisfactorily under all conditions outside the owner's control. (b) An improvements fund for providing sufficient additional money to enable the plant to be taken out of commission for reasons within the owner's control, and while it is still giving its service satisfactorily.

"The calculation of the amounts to be contributed to these two funds must include the interest which should be earned by the money before it is required at the end of the life. The amount, calculated as above, which should be in the renewals fund, gives the correct diminution in value, when considering the value to the owner, of the plant in place and working at any period in its history. The amounts, calculated as above, which should annually be put to the two funds, renewals and improvements, determine the correct depreciation charge against the undertaking for the purpose of assessing profits, fixing rates and, under certain conditions, assessing the value of an undertaking as a going concern.

"The sinking fund method fulfills all the requirements. The straight-line method does not. All estimates, such as first cost, physical and economic lives, and interest earned by funds, will require revision from time to time, either as a result of experience or of changes in conditions."

Forecast Traffic at Duluth, Minn.

Studies Reveal Influences of Precipitation, Wind, Temperature and Cloudiness on Traffic

INVESTIGATIONS undertaken at Duluth, Minn., with a hope of merely demonstrating positively that weather conditions influence passenger traffic to a greater degree than ordinarily supposed have revealed the fact that traffic may be forecast within a reasonable degree of accuracy. The methods employed and the results obtained are described by Eugene Van Cleef in the issue of the *Geological Review* for February, 1917. Duluth was selected for this study, as many people walk to and from work and because the writer was familiar with that city.

The weather during 1914 was not unusual; no strikes occurred and the "jitney" had not been developed. It was decided to base the comparisons on temperature, precipitation, wind, velocity and cloudiness. Humidity combined with excessive heat or cold winds is uncommon in the locality where the study was made and was not taken into consideration.

Average conditions for both morning and afternoon were recorded and, in the case of temperature, figures were taken at times when the traffic is heaviest, namely, 7 a. m., 12 noon, and 6 p. m. These conditions were plotted to scale and grouped according to similar days of the week. The average number of passengers for similar week days were also recorded, the year being divided into four divisions commencing with the months December-January-February. From the collected data, 100 forecasts were made covering a period from March to July, 1914, inclusive, 79 per cent of which involved an error of less than 5 per cent.

From an analytical study of the statistics and charts, the various factors assume the following order in degree of magnitude for reducing traffic: (1) Precipitation accompanied by wind; (2) precipitation alone, except light snow; (3) a considerable drop in temperature accompanied by a moderate to strong wind; (4) a strong wind, but most effective when in combination; (5) a decided drop in temperature regardless of other elements.

Projected Electric Tramway in Australia

A report by a firm of consulting engineers on the proposed electric tramway from Toorak road, South Yarra, to Clifton Hill Railway station, gave the estimated cost at $844,298; estimated revenue, $204,686; estimated expenditure, $195,550, and surplus revenue over expenditure, $9,152, according to the *Melbourne (Australia) Age*. The approximate length of track is 3.9 miles. The permanent way and overhead construction would be similar to that adopted by the Prahran-Malvern and Hawthorn tramway trusts. Power would be obtained from the Melbourne Electric Supply Company. Provision is made for ten single-truck and ten bogie cars capable of carrying forty and sixty passengers, respectively, and these would be housed at the Hawthorn Tramway Trust's depot, Hawthorn. An approximate population of 46,700 would be served by the tramway. The engineers expressed the opinion that the proposed tramway would supply a great public need, and set down the cost to each municipality as follows: Prahran, $202,704; Richmond, $320,543, and Collingwood, $321,050. Among the items of estimated expenditure are: New bridge over Yarra, $137,895; construction of double track, $234,374; altering water mains, $82,890; overhead construction, $43,655; cars, equipment, etc., $276,789.

Electric Railways in War Time

Further Comments on Canadian Activities and Experiences Are Presented, Together with Notes on Conditions in the United States, Where the Movement Toward Increased Agricultural Production Is Growing—Women Conductors Are Being Seriously Considered in Many Cases

IN the rapidly-moving series of events which the war has brought before the electric railway industry two features stand out most prominently at the present time. The more important of these is the wide extent to which electric railways have entered into the national movement for increased production of foodstuffs, and to this end a great variety of methods appear to have been adopted. These range from the mere granting of permission for employees to cultivate unused land owned by the company, through different co-operative arrangements whereby the company supplies seed or does the plowing, and include cases of the railways themselves doing all the work of cultivation with the idea of selling the produce to employees at cost. In all accounts of such plans the need for prompt action is sounded—obviously because the time available for planting garden truck for this summer's crop is growing very short.

The other feature that has assumed particular prominence in the recent developments has been the interest displayed in employment of women conductors. In no case, of course, has this reached the point where women have actually been thus placed upon electric railway cars in this country, and as a matter of fact it has hardly gone far enough to warrant any certain prediction that women conductors will be introduced in the near future. But the number of companies giving serious consideration to the possibility makes the subject worthy of serious thought. As described in the ELECTRIC RAILWAY JOURNAL for May 5, women conductors have been successfully introduced in Canada, according to the report of one company operating north of the border, and it must be remembered that Canadian practice and operating conditions are very similar to those obtaining on the electric railways of the United States.

COMMENTS ON THE WAR FROM CANADA

Among the other reports on war-time conditions that were received from electric railways of Canada in connection with last week's article was one from Wilford Phillips, manager Winnipeg Electric Railway, who made extended comments of special interest on the general situation in the large Western city of Winnipeg. These comments are published in part herewith as an additional means for visualizing the progressive results of the Great War upon a country that is, like ourselves, far removed from the actual front:

"I have great pleasure in complying with your request for an outline of electric railway conditions in Canada since the war, and trust that the experience of this company may be of some assistance to our allies in the United States.

"When war was first declared in August, 1914, the Winnipeg Electric Railway Company was in a prosperous condition; its men were efficient and well satisfied. Our first step after the declaration of war was to place armed guards at our own expense at strategic points on the company's system, guarding the power houses, gas works, etc., to prevent any alien enemy from interfering with our operations. These guards are still on duty, and up to the present time we have had no trouble in this connection.

"Almost immediately after war was declared the governments of France and Great Britain called their reservists to the colors, and a large number of our oldest and best men left us, practically without notice, to take

RECRUITING CAR. 80TH Batt
FALL IN! WITH OTTAWA BOYS AT BELLEVILLE.
HELP US ENGE Cavell
80th Batt

RECRUTING CAR OF OTTAWA ELECTRIC RAILWAY WITH RECRUITS OBTAINED DURING ONE SUNDAY AFTERNOON TRIP their places at the front. Volunteer battalions were formed, and the company did everything in its power to assist recruiting among its employees. When we compiled our Honor Roll recently we found that more than 30 per cent of our men had left us for active service, coming from all departments of the company. [This Honor Roll as of March 31, 1917, contains 560 names, of which 517 had been accepted by the government. About 220 of the men were in battalions formed early in the war and have seen much active service, and of these twenty-six have been killed in action or have died of wounds; thirty-eight have suffered disabling wounds or shell shock, while five have returned because of sickness or injury. Only three out of the 220 men have been taken prisoner!—EDS.]

"An efficient provincial organization was formed for the purpose of taking care of soldiers' dependents during their absence at the front. This company and its employees during the first twelve months of war supplied approximately $20,000 to the Manitoba Patriotic Fund, and since then have subscribed additional large sums from time to time. The fund is now in a splendid financial condition, and finds practically no difficulty in doing its work satisfactorily.

"The following table showing revenue passengers carried and car-miles operated by this company for the month of March for each of the past five years will show the progressive effect of the war upon our traffic:

	Revenue Passengers	Car-Miles
Month of March, 1913........	4,884,609	698,505
Month of March, 1914........	4,992,593	706,617
Month of March, 1915........	4,419,031	833,808
Month of March, 1916........	5,291,960	906,960
Month of March, 1917........	5,120,533	873,466

"Immediately after war was declared many large industries, owing to their inability to obtain funds, were obliged to close down. Construction of almost every kind ceased entirely, as it was thought that every available cent should be devoted to the prosecution of the war. I believe that more than 20,000 men out of a total population of approximately 200,000 have left the city of Winnipeg. In many cases these men have been followed by their families, or their families have moved away to other places. Although there is a natural increase in the population, and new people are continually coming in, we find there is an actual large net decrease and this naturally has its effect on traffic.

"Large numbers of soldiers during the winters of 1914-1915 and 1915-1916 were, of course, in barracks in Winnipeg, and this caused an increase in traffic. But all went into camp in the summer months, and the sudden withdrawal of large numbers of men from the city caused a decided depression in business and consequently in our receipts.

"The advent of the jitneys has also had an effect, and a very substantial one, on our traffic. Had it not been for the war we are strongly of the opinion that many of the jitney drivers would have been able to find more profitable employment and would not have gone into the jitney business. But owing to the war and the general depression which followed it, many large industries ceased construction work, as stated above, through inability to procure new capital, and many men were thrown out of employment. These men, together with real estate agents and other local men whose employment ceased because of war conditions, became jitney drivers and were licensed by the city.

"Naturally the increase in the number of automobiles operating on the streets in the city caused a very large increase in our automobile accidents.

"Our motormen and conductors are paid a graduated wage scale, and we have noticed a steady rise in the average wage per man-hour. This we attribute to the fact that men enter our service, stay with us a few months or a year, and then enlist, while those married men with families, or men who for personal reasons did not wish to enlist, stayed with the company because they were unable to find as reliable and profitable employment elsewhere. At the present time more than 60 per cent of our man-hours are worked by the men who have been with the company more than three years.

"I feel honored by your request for advice for the electric railways of the United States. If I could offer any remark to this end, it would be that the electric railways go to war with all their might and place every cent of their resources and every man in their employment at the disposal of the authorities until such time as the war is successfully concluded. If this is done, we need have no fear for the future, as that will take care of itself."

RETRAINING DISABLED SOLDIERS IN CANADA

A feature of another report, which was sent to this paper by A. G. Graves, Commissioner of Public Utilities, City of Calgary, Canada, was an explanation of the means taken by the Canadian government for providing returned soldiers with occupations. In part Mr. Graves states: "I might mention that the military authorities have about 200 men in the Ogden Military Hospital which has been established at the end of one of our car lines, some 4 miles from the center of the city. These men have been wounded at the front and have returned, being now in all stages of convalescence. Many of them are entirely unfitted to follow their former occupations. Consequently the provincial government has established a school of technology and art in the city of Calgary, and all returned soldiers who desire it are being taught some trade or calling so as to enable them to become self-supporting. The street railway transports these men to the hospital and school and return at the price of one fare.

"Furnishing occupations for returned soldiers is probably one of the greatest after-the-war problems that this or any country will have to face. In Canada it was soon found that from 10 per cent to 30 per cent of the soldiers that returned from the front, owing to wounds or illness contracted in the service, could not take up their previous callings. Consequently, in each province of the Dominion a committee composed of leading business men was formed to make provision for examining and training these men in new vocations. At the present time about 200 soldiers, or say 10 per cent of the total number from this province who have returned from the front, are being trained in about twenty different occupations. These include office work, wood carving, poultry raising and gardening. There is also a school of agriculture for those who have shown a preference for farming. The bulk of the training is being carried on at the Provincial Institute of Technology and Art, which started operations in September, 1916. Here the soldiers are given shop work involving repairing and handling of machines and engines, as well as instruction in electricity, chemistry, mathematics and business correspondence. The course lasts for eight months and the soldier and his family are kept by the government for that time. At the end of this course each man is practically guaranteed a position in his chosen occupation.

"The employment of the returned soldier is not a serious problem at present, but as soon as peace is declared and demobilization begins, a more serious problem will confront the Dominion. Fortunately many of the firms will provide positions for those who return, and the government will probably begin large undertakings, such as permanent roads, building of docks, etc., which will absorb a great deal of labor. At the present time plans are on foot to provide each returned soldier who wishes to go on the land with 320 acres and a loan of $1,500. If land can be procured adjacent to railway facilities, there is no doubt that many veterans will take advantage of it."

In connection with the percentage of enlistments of electric railway employees, figures have been received from L. A. Thornton, city commissioner, City of Regina, Canada, which show that the withdrawals of the employees from the service of the local municipal railway through enlistment was 35.5 per cent—apparently a maximum for the Dominion. Of these withdrawals, 37.8 per cent were conductors and motormen, while 28 per cent came from the other classes of electric railway employees. These figures apply to enlistments only. Mr. Thornton states that, for replacements, men have been employed at the lowest rates in the schedule, and this has somewhat compensated for the loss in efficiency due to the inexperience of the newer men. He advances the interesting theory, however, that all of the railway employees have increased in efficiency since the beginning of the war. This is because there has been a universal tendency to take more interest in serious matters, and fortunately that attitude has been generally extended to the details of daily work.

STIMULATING AGRICULTURE

The movement on the part of the electric railways in the United States to assign unused land, especially that along the right of way, to employees for the purpose of cultivation has, as previously remarked, gained strength during the past week, and in other ways also the railway industry is exhibiting a very definite interest in the vitally-important matter of increasing our food production. The Pennsylvania Railroad has had a booklet printed under the title "Raise Potatoes and Help Win the War," and is about to distribute it to farmers and to residents in towns and suburbs along its line. The booklet, which is in vest-pocket size, is most interestingly arranged and illustrated. It is a condensation of a special bulletin on potato culture that has been issued by the department of agriculture of the commonwealth of Pennsylvania, and it sets forth the most approved methods followed by scientists and practical growers for successfully producing this crop.

In its introduction the booklet states: "Potatoes are eaten universally. They are healthful, sustaining and satisfying. They have the very great advantage that, if proper methods of cultivation are followed, enormous yields are obtainable from a given area of ground. From 300 bushels to 500 bushels can be raised from a single acre by care and skill. Potatoes are, therefore, particularly adapted to meeting the emergency created by the scarcity of food resultant upon the war. All Americans who can should raise potatoes this summer. Every potato produced before next fall will be more effective in the cause of the United States and her allies than a bullet."

The booklet is being distributed to station agents and to the freight traffic department of the Pennsylvania Railroad at Broad Street Station, Philadelphia, Pa.

Among the interurban railways of the Middle West, the St. Joseph Railway Light & Power Company, St. Joseph, Mo., has undertaken the plan of entering, itself, the business of raising garden truck. Recently the company began work with four teams and plows to prepare the soil on its Savannah interurban right-of-way for the planting of potatoes. About 50 acres will be available for cultivation on the length of the line, and the company may even rent an equal acreage, and plant this also with potatoes. The crop will be sold to the employees of the company at the cost of labor and seed, the company itself handling all farming operations.

On the Waterloo, Cedar Falls and Northern Railway, the employees have been asked to make application to the superintendent for any of the company's land that they may desire to cultivate. This opportunity has been limited to the period prior to May 15, and employees are not allowed to request ground unless they or the immediate members of their families desire to use it. The practice of requesting ground and assigning it to another not an employee of the company, either with or without payment, is positively prohibited. The company also is sending to each employee a pamphlet on scientific gardening. This was furnished through the courtesy of W. L. Clark, vice-president, Illinois Central Railroad, who is greatly interested in the movement for increased food production and is doing everything in his power to accelerate it.

The Northern States Power Company of Faribault, Minn., has entered the movement by donating seed and several acres of land to employees. The company will do the plowing and otherwise aid the movement in every possible way. Similarly the Union Traction Company of Indiana, which holds a very considerable amount of land in Anderson in addition to its right-of-way, is strongly encouraging the movement and all of this ground is to be apportioned out at once to employees who wish to cultivate it. The company has also donated forty-four city lots, to which it holds title, to the Chamber of Commerce of the city of Anderson, and already nearly 100 citizens have made application for pieces of this ground for truck-gardening purposes.

Officials of the Tri-City Railway & Light Company, operating in one of the rich agricultural districts of the State of Iowa, estimate that the yield of potatoes from the sections of the right-of-way that are now under cultivation will be nearly 7000 bu. for the year. Practically all of the ground adjoining the tracks from Muscatine to Clinton, a stretch of approximately 70 miles, is to be utilized except where the tracks pass through towns or where crops cannot be raised.

About 100 employees of the Public Service Commission for the First District, New York, have leased 35 acres of land on Long Island, and each member of the group has volunteered to devote at least one week of his vacation period to the putting in and harvesting of the crops upon this farm.

REVIVES PLAN FOR HANDLING FREIGHT IN CITY STREETS

Managers of the various traction properties of the Cities Service Company have been instructed to investigate the possibility of hauling freight at night by electric railways as a means for reducing the cost of living. H. L. Doherty, president of the company, recently returned from extended visits to Toledo, Kansas City and other middle western points convinced of the feasibility of this plan. He considered that a primary move to make the idea a success would be the starting of an extensive educational advertising campaign in each city, which would tend to show the public the benefits of the innovation and consequently pave the way for legislation necessary to amend franchises not now permitting this form of traffic. A serious duplication of handling small loads and consequent waste exists in the facilities for handling food supplies, and it is believed that the hauling of freight at night on street car tracks will not only eliminate the congestion on city streets, but will carry the corporation out to the farmer so that it buys from him on the spot and so eliminate the intermediate toll of delay and waste.

Night freight hauling by electric lines need not be limited to food, according to Mr. Doherty, as it could also include such commodities as coal. In many instances coal dealers must haul coal from distant pockets to the consumer during the day, which increases traffic congestion on the streets. The location of coal pockets near the distributing centers would do much to eliminate this wasteful procedure, as the coal could then be served to consumers as needed in their immediate neighborhoods.

The public utility properties operated by the Doherty interests already have nearly 2000 acres of potatoes and other food products under cultivation, with the idea of selling the products to employees at cost. This, it is thought, will net a larger production than is necessary for the employees, and plans are now being drawn for the general marketing of the surplus products.

WOMEN CONDUCTORS SERIOUSLY CONSIDERED BY SEVERAL ROADS

Since the recent announcement of the Boston Elevated Railway that it was likely to make use of women conductors as a means for replacing the platform men who may be drafted into military service, no less than fifty women have applied for such positions. However, the company has no definite plans for hiring women conductors at present, and all that the road's employment office has done has been to take the names and addresses of the applicants, pending further developments in the situation. Most of the applications have come in by mail, but a few young women have applied personally.

Two roads have definitely announced that applications were desired from women to act as conductors. One of these is the Corning (N. Y.) & Painted Post Street Railway. One-man car operation was tried on this line recently but was discontinued owing to the opposition of the public. The company is now planning to secure women to serve as conductors upon four runs during off hours for the purpose of determining how the plan will work out in practice.

Another company which has definitely solicited applications from women is the Beaver Valley Traction Company, New Brighton, Pa. While it is not the intention to instal women immediately, the company has announced that the shortage of labor and the desire of the company to avoid a tie-up of the transportation facilities of the Beaver Valley have made it advisable to have applications from women for this service on file.

MISCELLANEOUS NOTES

In recent issues of *Electric Railway Service* and *The Electrogram,* published respectively by the Detroit United Railway and the Puget Sound Traction, Light & Power Company, there have appeared appeals for recruits for service with the colors. These include statements from local recruiting officers for the army, navy and the marine corps, calling attention to the opportunities offered in the way of adventure or advancement to be obtained in the various arms. In addition these publications printed an appeal from the Red Cross organization.

Plans for reinstatement of employees drafted into the army have been decided on by the Waterloo, Cedar Falls & Northern Railway, and have been published in the following bulletin: "All employees of this company who enlist voluntarily in the army or navy of the United States or are drafted under the selective conscription plan are assured by this company that their seniority as employees will be preserved. At the termination of the period of their governmental service and when they are mustered out of such service they will be reinstated in their positions with this company, and their service with this company will be considered as continuous from the time they first entered its employment."

Owing to the imminent coal shortage that is faced by a number of electric railways, the recent establishment by the government of a national committee on coal production is of interest. F. S. Peabody, president Peabody Coal Company, Chicago, has been designated as chairman of the committee and has opened offices at the Interior Building at Eighteenth and F Streets in Washington, D. C.

Publication of bulletins outlining the work done by the steam railroads' special committee on national defense has been begun by the American Railway Association. The first bulletin describes how the railroads of the country will be operated during the war under the plan of pooling all railroad interests and placing the direction of the resulting continental railroad system in the hands of an executive committee composed of five railroad presidents, a member of the Council of National Defense and a member of the Interstate Commerce Commission. Fairfax Harrison of the Southern Railway System is chairman. This plan of operating the country's railroads covers all classes of service—that which is conducted on behalf of the public as well as that for the government.

Meeting of N. E. L. A. in New York

Electric Lighting and Power Men Hold Enthusiastic Gathering on Short Notice in Place of Usual Convention

THE National Electric Light Association held its fortieth annual convention in New York City on May 9 and 10. It has been customary to hold the meeting in June, but on the outbreak of the war it was decided not to hold a meeting of the usual type but promptly to convene for the discussion of the pressing problems of the day.

In accordance with the purpose of the meeting the time was all taken up with addresses of patriotic import and the routine business essential to the proper working of the association. It was decided that the papers and reports which had been prepared for presentation at the June convention should be admitted to the proceedings after they had been passed upon by a special committee consisting of Secretary T. C. Martin and the chairmen of the several sections. The section chairmen were continued in office for the coming year. A summary of the reports which are of special interest to electric railway men will be abstracted in a later issue of the ELECTRIC RAILWAY JOURNAL.

The election of officers and members of the executive committee resulted as follows: President, J. W. Lieb, New York Edison Company; first vice-president, W. F. Wells, Edison Electric Illuminating Company of Brooklyn; second vice-president, R. H. Ballard, Southern California Edison Company; third vice-president, Samuel Scovil, Cleveland Electric Illuminating Company; fourth vice-president, D. H. McDougall, Toronto Power Company; treasurer, W. H. Atkins, Edison Electric Illuminating Company of Boston; executive committee, Paul Spencer, United Gas Improvement Company; Walter Neumuller, New York Edison Company, and E. W. Lloyd, Commonwealth Edison Company of Chicago.

SPIRIT OF THE MEETINGS

The addresses by some of the most eminent men in the industry reflected a splendid patriotic spirit. They showed that the men in the lighting and power field realize the responsibility resting upon them by virtue of their intimate relation to the every-day work of the nation. The addresses contained many statements to demonstrate that the companies are alive to the necessity for being ready to produce much greater outputs of reliable power, for placing their technical talent at the disposal of the government, and for furnishing their full quota of men at the front without unnecessary hardship to the employees' dependents. Typical of the spirit of the gathering were the remarks of one speaker who said: "The man who makes up his mind to lay down his life for his country wants all the encouragement to go to war that he can get. He goes because he considers it a duty to go, and I consider that every man who is allowed to stay at home should be thankful if he is in any way able to do anything, and he should consider it a great privilege that he is allowed to stay at home. Every man who is selected wants all the encouragement and enthusiasm put behind him that is possible, no matter how he is selected."

Traffic Notes from San Antonio

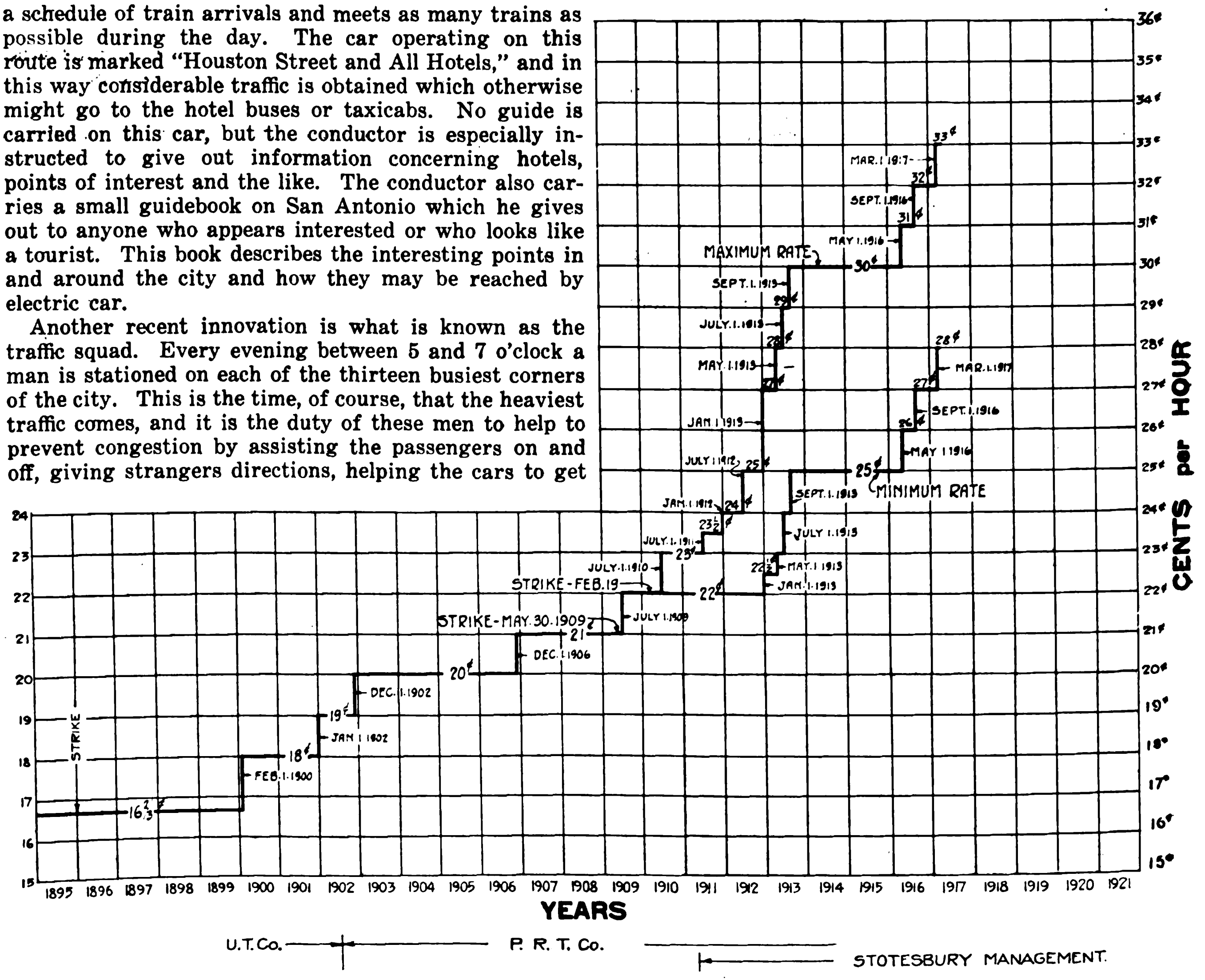
The San Antonio Traction Company has several methods for developing city traffic. One of these is the operation of a special car between the three railroad stations and the hotels in San Antonio. The crew has a schedule of train arrivals and meets as many trains as possible during the day. The car operating on this route is marked "Houston Street and All Hotels," and in this way considerable traffic is obtained which otherwise might go to the hotel buses or taxicabs. No guide is carried on this car, but the conductor is especially instructed to give out information concerning hotels, points of interest and the like. The conductor also carries a small guidebook on San Antonio which he gives out to anyone who appears interested or who looks like a tourist. This book describes the interesting points in and around the city and how they may be reached by electric car.

Another recent innovation is what is known as the traffic squad. Every evening between 5 and 7 o'clock a man is stationed on each of the thirteen busiest corners of the city. This is the time, of course, that the heaviest traffic comes, and it is the duty of these men to help to prevent congestion by assisting the passengers on and off, giving strangers directions, helping the cars to get away, assisting in case of accident, etc. At certain places also where there are no electric switches these men turn the switches and thus speed up the line. The plan has met with much favor, both with the public and with the regular car crews.

Increasing Labor Costs

IN the ELECTRIC RAILWAY JOURNAL of April 7, page 643, there was presented an abstract of Director W. S. Twining's analysis of the Philadelphia Rapid Transit Company proposal for the operation of new city-built high-speed lines in Philadelphia. In connection with this analysis Mr. Twining presented various reasons why the city should exercise caution in guaranteeing a preferential to the Philadelphia Rapid Transit Company for a long period.

One reason cited was the diminishing profits in the street railway business. During the last fifteen years, Mr. Twining said, the cost of street railway service per passenger has increased greatly. Wages, for example, now constitute 62 per cent of the operating expenses, and future wage scales are of the greatest importance. To illustrate how wages had increased, he presented the accompanying chart, which shows in a striking way the rise in trainmen's wages in Philadelphia since 1895.



MAXIMUM AND MINIMUM WAGE SCALES OF PHILADELPHIA RAPID TRANSIT SYSTEM FROM 1895
(ELEVATED MOTORMEN 3 CENTS PER HOUR MORE THAN ON THE SURFACE LINES)

Extension of London Underground System

Subway Equipment with Unusual Features of Body Design and Electric Control Is Operated Over an 8-Mile Section of the London & North Western Railway Tracks to Give Through Service Between the Suburbs and the Center of the City

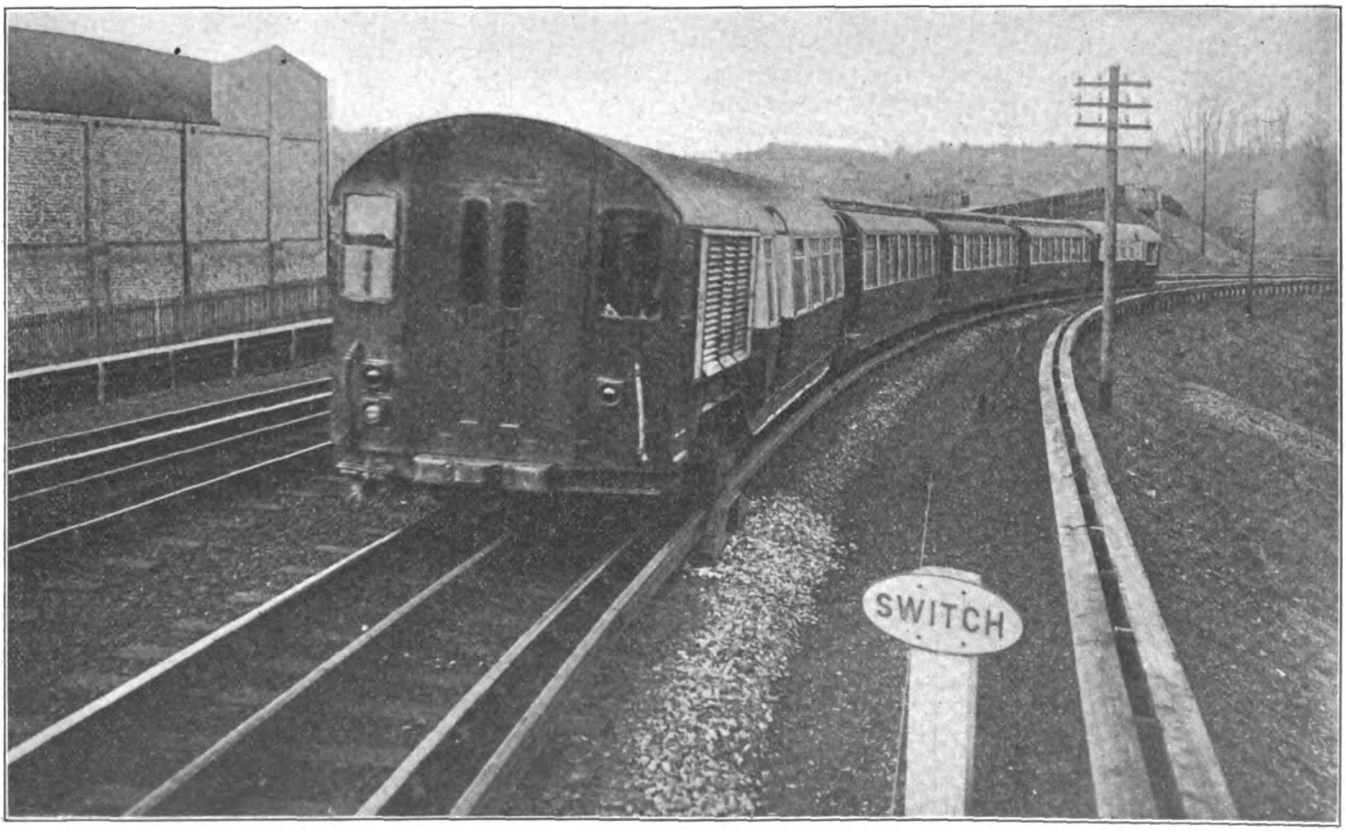
RECENTLY there has been placed in service an extension of the Bakerloo underground line in London, England, which will open up a large area of new countryside and residential districts, and will directly connect the northern suburbs with the central, west end and southeastern districts of the city. In part, the tracks of the London & North Western Railway are used, and this will give the passengers of this system a choice of some five terminal stations in town connecting with main-line railways. The new extension is about 8 miles in length. It runs above ground for this distance, although the cars to be used upon it are, of course, designed for subway service, since the remainder of the 20-mile route is underneath the surface. Power at 600 volts direct current will be supplied to the extension from the London & North Western power houses at Willesden.

CONTROL EQUIPMENT

As the route makes use, in part, of the tracks of different railway systems of which one employs an earth return while the other employs an insulated return consisting of a fourth rail, it has been necessary to modify the equipment of the motor cars accordingly. For this purpose two additional sets of shoes have been fitted on the motor trucks of the cars, one set on either side. On the trailing truck of the motor car insufficient clearance exists below the body to fit shoes for the fourth rail, so that these have had to be arranged on the truck of the adjoining trail car, connection being made to the motor car by means of jumpers.

For the conversion from earth to insulated return negative switches and fuses to the main circuit and to each of the auxiliary circuits have been provided. In doing this, care was taken to reproduce the standard wiring arrangement of the road that uses insulated return, so that, electrically, the difference between the two types of rolling stock is confined to the control equipment.

The control, which is supplied by the British Thomson-Houston Company, is of the relay automatic type, the contactors being picked up in their correct sequence by the current-limiting relays when the controller handle is placed on the operating point. The principle underlying this method of control is that, after a contactor has been picked up, its coil is immediately transferred, by means of interlocks, to another wire. Thus there are essentially two operating wires, the pick-up wire and the retaining wire, although other wires are introduced for forward and reverse, circuit breaker setting, etc. There are no main bus lines

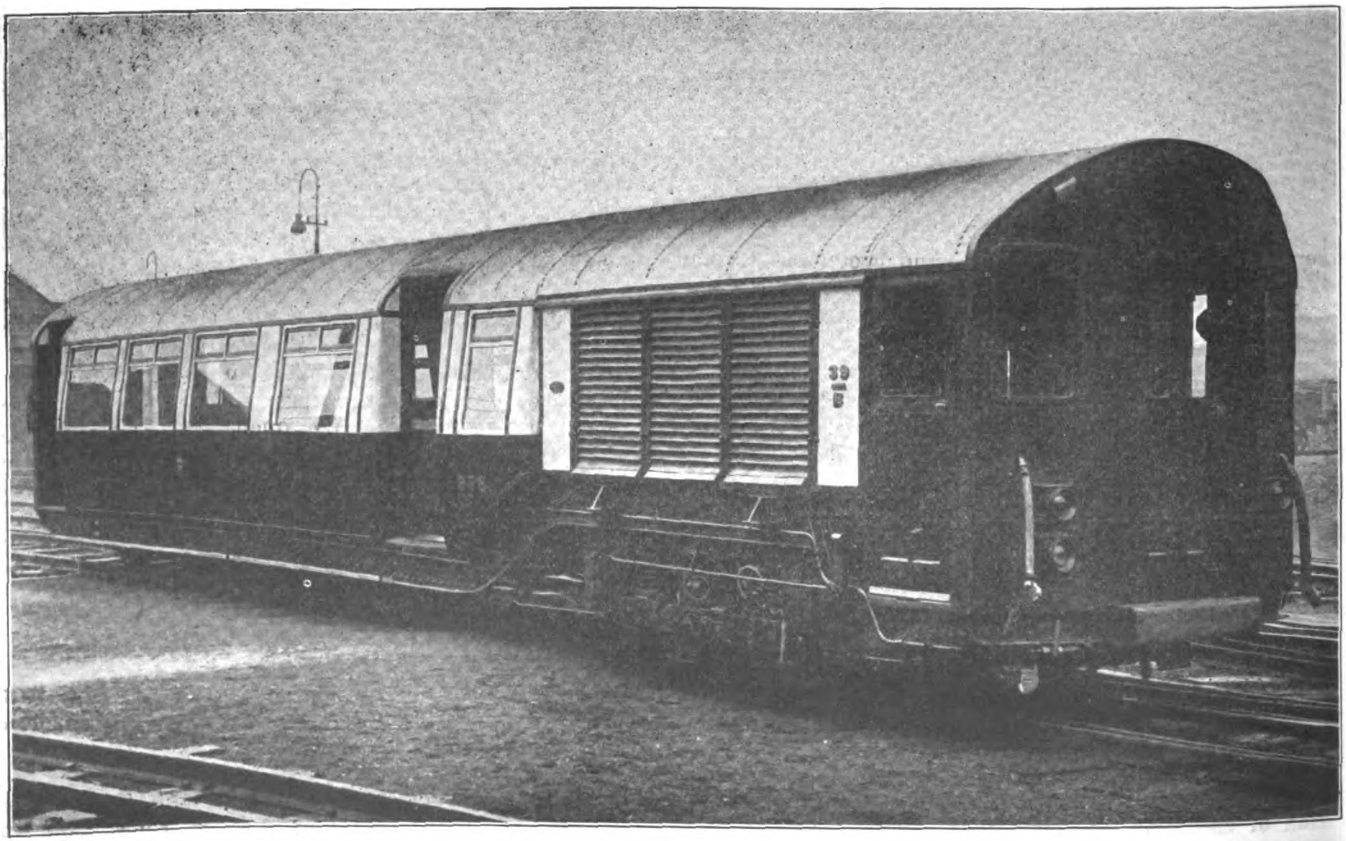


LONDON UNDERGROUND EXTENSION—FIVE-CAR SUBWAY TRAIN OPERATING OVER MAIN LINE RAILROAD TRACKS IN SUBURBS

LONDON UNDERGROUND EXTENSION—GROUP OF WOMEN GUARDS, OR GATE WOMEN, WHO OPERATE THE NEW SERVICE AND ARE SUBORDINATES OF THE MASCULINE OFFICIAL APPEARING AT THE LEFT OF THE ILLUSTRATION

through the train, which is composed of a motor car at the front and rear and three trailers between them. Consequently a potential relay is fitted on each motor car, and this drops all contactors on that car when the shoes lose current. This is necessary because, when no current passes through the main coil of the current-limit relay, it ceases to exercise its control over the rate of picking up contactors.

The controller has four forward points and two reverse points, of which Nos. 2 and 4 are running points where all resistance is cut out. A useful provision in the control is that, if in the course of the automatic notching-up the controller handle is brought back to the first or third notch, as the case may be, the automatic closing of contactors is stopped, but those already closed are kept up. Another feature is the operation of the safety button on the controller handle, which may be released except when at off position. But if the handle itself is let go it flies back to off position, instantly cutting off current and applying brakes throughout the train. Another safety device which is now a part of the standard London Electric Railway equipment is the control circuit governor. By interrupting the control circuit, this prevents the train from



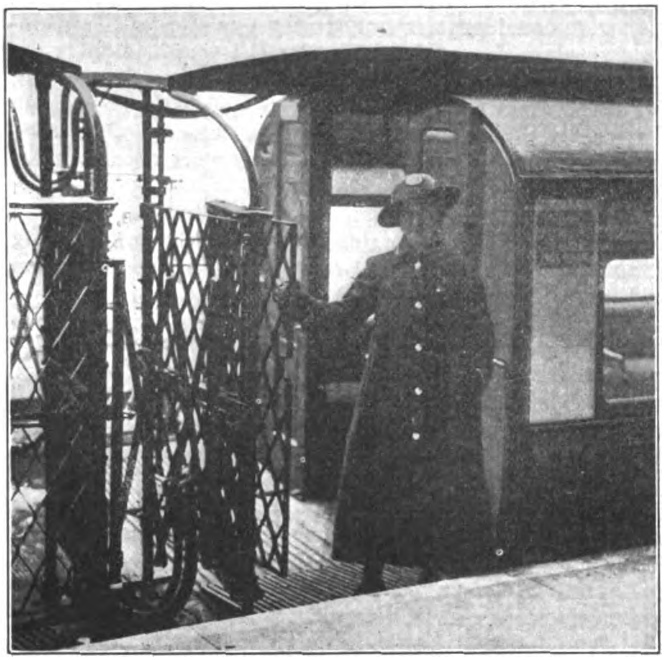
LONDON UNDERGROUND EXTENSION—MOTOR CAR WITH CONTROL EQUIPMENT COMPARTMENT ELEVATED TO CLEAR MOTOR TRUCK being moved forward unless the train pipe of the Westinghouse air brake is charged with air and the trip-cock is cut in.

Each motor car is fitted with two General Electric 212 motors of 240 hp., mounted on the same truck and geared for a free running speed of 35-40 m.p.h.

ROLLING STOCK

As mentioned above, each train consists of five cars, two motor cars and three trailers. The latter are standard London Electric Railway cars, while the motor cars were designed for a new extension over the Great Western Railway, whose opening has been postponed for the time being. The motor cars are provided with covered vestibules at the trailing ends, and they have center doors. They were described in the ELECTRIC RAILWAY JOURNAL for Feb. 7, 1914, page 298.

This is the first case wherein rolling stock designed for underground service has been run in passenger service on a main line railway, and provision has had to be made for passengers to get on or off at the stations on the London & North Western Railway, which have platforms of the standard main-line height—higher than that obtaining in the underground tubes. This has been accomplished on the trail cars by superimposing short ramps on either side of the existing platforms of these cars. It has been possible to do this without encroaching upon available headroom, owing to the open character of the gangways. But the closed vestibules on the motor cars have prevented any similar provision for this equipment.



LONDON UNDERGROUND EXTENSION—VIEW OF CAR PLATFORM AND GATE SHOWING RAMPS DESIGNED TO PROVIDE FOR VARIATIONS IN STATION PLATFORM HEIGHT

The number of seats on each motor car is thirty-two, and on each trailer fifty-two. Third-class accommodations only are provided. The car bodies are constructed of steel, with some wood interior finish. Ventilation is provided by an air duct with perforations which runs for the whole length of the car, and is open to the atmosphere at the ends. The prominent feature of difference from common practice in the United States is the installation of control equipment in a raised section of the body over the motor truck. This is done to save height.

General dimensions and weights of the motor cars are as follows:

Length over all	47 ft. 9 in.
Width over body	9 ft. 8 in.
Total height from rail	9 ft. 8 in.
From center to center of truck	29 ft. 6 in.
Diameter of motor wheels	36 in.
Diameter trailing wheels	29 in.
Weight on motor truck wheels	47,500 lb.
Weight on trailer truck wheels	20,200 lb.
Total weight of car completely equipped	67,800 lb.

The total weight of a five-car train without passengers is approximately 246,000 lb., and the seating capacity is 220 passengers.

New Plan of Pennsylvania Railroad to Secure Help

Under a new plan for handling applications for work, which is now being put into effect by the Pennsylvania Railroad, every one of the 1500 station agents on the lines east of Pittsburgh and Erie will become an employment agent. In connection with this change, what will virtually be an employment clearing house is to be established in the general manager's department at Broad Street Station, Philadelphia. The purpose of the new plan is to encourage the entrance into the service of the Pennsylvania Railroad of men who live in the neighborhood of its lines and shops. It has always been the policy of the company as far as possible, to offer the first opportunities for work to people who are its neighbors. It is the belief of the management that a number of men in the country districts, as well as in the towns, villages and cities through which its lines pass, would welcome the chance to make railroading their career, but in many cases do not know where to apply. The new employment arrangements will make it easy for anyone to make an application and to ascertain what lines of service are open and in what localities work for which he is fitted may be obtained.

Notices will be posted conspicuously at various points along the railroad, directing all persons seeking employment to apply to the station agent. The agent will interview each applicant, learn his capabilities as fully as possible and direct him to the nearest shop foreman, supervisor, trainmaster or road foreman of engines, who may have vacancies at his disposal. If there are no vacancies on the division where the application is made, it will be forwarded to the office of the general manager in Broad Street Station, where it will be handled through the clearing house plan which is to be established there. Under the clearing house plan, each general superintendent will forward, once a week, to the general manager a list showing the number of vacancies on his grand division for shop laborers, car repairmen, car cleaners, engine cleaners, brakemen, firemen, freight handlers, trackmen, etc. By this means every applicant for work can be promptly directed to the nearest point where labor is needed, in case no opportunity exists near his home. This arrangement, it is thought, will greatly aid in equalizing the distribution of labor and the opportunities for work in the railroad service.

Cough Drop in the Fare Box

The following note was on the trip card for March 28 of one of the conductors of the San Francisco-Oakland Terminal Railways:

"Deducted 10 cents from cash, account Mrs. .... of No. .... Avenue, who dropped a cough drop in fare box with her nickel. I took note of same, and the cough drop came through and registered 10 cents."

More Revenues Sought in New York

Third Avenue Railway Informally Suggests Transfer Change to Commission—Other Companies Considering Increases

RUMORS that the street railways in New York City were planning to increase their fares were confirmed on May 9 by the Public Service Commission for the First District. Although no formal application has yet been made, it appears that the Third Avenue Railway recently suggested to the commission in an informal way that owing to its need for increased revenues the commission might allow it to make a 1-cent charge for transfers.

None of the other companies in the Metropolitan district, it was said, had either formally or informally applied for a higher fare or a transfer charge. It is the opinion of commission representatives, however, that the question of securing larger revenues to meet increases in operating costs is "in the air" for all industries, and the other surface lines in the city will probably sooner or later apply for some form of financial relief. No increase would be granted, however, until the case had been threshed out in public hearings according to law, and until the regular procedure of the commission in rate cases had been followed.

THIRD AVENUE NEEDS MORE MONEY

The attitude of the Third Avenue Railway in regard to increased revenues is shown by a memorandum submitted to Chairman Straus on April 11 by E. A. Maher, Sr., president of the company. This memorandum followed a series of talks between Mr. Maher and members of the commission, in which Mr. Maher asserted that his system was not meeting its fixed charges and would have to find a means of increasing its revenues.

The memorandum, outlining in detail Mr. Maher's position on the subject, stated that there are four methods by which electric railways could hope to increase their income or, if present conditions continue, to prevent the accumulation of constantly increasing deficits. These are as follows: (1) Decreasing the cost of operation, (2) lowering the quality of service, (3) securing decreases in taxation and (4) securing additional allowances above the regular fare for transfers.

In Mr. Maher's opinion, it seemed impossible to make any substantial reduction in operating costs, in view of the increase in nearly all items connected with electric railway operation. Prices of all materials have shown enormous increases, labor has advanced materially and power costs have risen. In regard to lowering the quality of service, Mr. Maher said that there is no reason to suppose that any relief can be obtained in this way. The trend of public demand and of commission orders and recommendations is toward improved service. As for lower taxes, the tendency appears to be toward an increase rather than a decrease, and probably most forms of taxes, federal, state and municipal, will be made much heavier. One indirect form, the expense of paving renewals and replacements, might in all justice be reduced in large part, if not entirely suspended.

In discussing a transfer charge, which in the talks with the commission had been understood to be 1 cent, Mr. Maher said that under past conditions, in connection with service rendered, the 5-cent fare had been perhaps reasonable, but that the fare per passenger is no longer 5 cents. The transfer privilege has been extended so greatly that now the company is confronted with a situation whereby the carrying of more passengers means the loss of more money. Mr. Maher said that the Third Avenue Railway is facing a critical situation, being confronted as it is with constantly increasing costs of operation which it cannot control, and being unable to increase its revenues. It must in the near future spend large amounts for reconstruction and repair work on tracks, and its gross earnings are expected to be reduced, temporarily at least, when the new subway and elevated extensions are opened. In his opinion, therefore, the only relief that can be hoped for is an increase in earnings through a rearrangement of the transfer privilege or a reduction in taxation through the abatement of paving charges.

REPLY OF THE COMMISSION

The attitude of the commission in regard to Mr. Maher's informal memorandum is shown in the following letter of April 26, sent to him by James Blaine Walker, secretary of the commission:

"I am directed to acknowledge the receipt of your letter of April 11 addressed to Chairman Straus, submitting a memorandum dated April 6 on the question of devising means for increasing the revenue of the Third Avenue system.

"On any such question the commission can, under the law, give consideration only to the question of a reasonable return. If consideration by the commission is desired an application should be made formally, setting forth the facts fully, the remedy desired and the reason for such application and the desired remedy. The commission will then consider the matter as set forth under the provision of law."

It is reported that the Third Avenue Railway, in accordance with the foregoing letter, has been preparing a formal application for relief, but no confirmation of this has been issued.

ATTITUDE OF OTHER COMPANIES

Theodore P. Shonts, president New York Railways, states that the officers of the company have discussed means of increasing the operating revenues, but have not reached a decision. Continuing, he is quoted as saying:

"We have considered a 6-cent fare, a 1-cent transfer and a 2-cent transfer, but it would be premature for me to discuss any of these at this time. A serious situation exists and will have to be met by some means. We have had prepared a list of the increases in operating costs this year and they range from 70 to 1100 per cent.

"We know, after the financial survey just completed, that the surface lines are in actual danger unless some means is quickly provided for their relief. The subway and elevated lines are not to be affected. In fact, the 'preferential clauses' in our contracts with the city remove them from any possible connection with the present situation. The directors of the New York Railways are keeping in touch with the situation, but we have not discussed the matter either formally or informally with the commission."

H. A. Bullock, assistant to President T. S. Williams, Brooklyn Rapid Transit Company, expressed the attitude of his company as follows:

"The same situation confronts transportation companies all over the country, and there has been much talk among railroad men of raising the usual fare from 5 to 6 cents. B. R. T. officials have participated in these discussions and have considered it seriously. They have not yet taken up the subject with the Public Service Commission, however, either formally or informally, and there is no certainty as to what they will do about it."

NEW YORK ASSOCIATION MEETS

As this paper went to press on May 11 a meeting was being held at the Hotel Astor of the New York Electric Railway Association to consider the best means of securing relief.

COMMUNICATIONS

The Arch-Bar Truck in City Service

PITTSBURGH RAILWAYS COMPANY
PITTSBURGH, PA., May 9, 1917.

To the Editors:

Referring to S. A. Bullock's article in your April 21 issue on the question of truck equalization, it seems that all are agreed that proper equalization is a desirable feature of truck construction. We are not familiar, of course, with the data from which Mr. Bullock makes the deduction that the well-known arch-bar type of truck produces discomfort to passengers or unusual hammering on the track. The contrary of this statement becomes readily apparent when one takes the time to ride in a car equipped with this type of truck and then immediately afterwards rides in a car which is equipped with any other type of truck having wheels of large diameter.

The contrary of Mr. Bullock's view is also very apparent to those who have taken the trouble to observe equalizer-bar trucks with large-diameter wheels negotiating special work at intersections, either at low or high speed, as compared with a car equipped with the so-called arch-bar type of truck.

With regard to the question of bolster equalization, it may be said that the same system of bolster suspension is used in the equalizer-bar type of truck and the arch-bar type of truck, so there remains no difference in construction between the two types of trucks in this particular.

We take issue with Mr. Bullock in his assumption that the arch-bar truck produces more noise, is less flexible and has more box play than the design with equalizer bars. Practical experience in the use of the arch-bar truck over a period of some seven years proves the contrary to be the case, and this same situation obtains with regard to Mr. Bullock's assumption that this type of truck produces greater distress to the track, truck and body.

With regard to the equalization feature of the side frame, we are in accord with Mr. Bullock's statement that "efficient equalization requires a spring base (or point of support) less than the wheelbase and an equalizer which acts as a lever." If it is essential that the spring base (or point of support) be less than the wheelbase, with the equalizer acting as a lever, the natural inference is that the closer this spring base (or point of support) approaches the center line of the side frame, the more effective equalization is obtained. A maximum of side-frame equalization would be obtained if the bolster was supported on the side frames on knife edges, or if the pivotal point lay at the center line of the truck bolster. As a matter of fact, the so-called arch-bar truck contains this feature through the transom connections. The transoms connecting the side frames are, when properly designed, capable of producing and sustaining without injury the slight torsional movement necessary to produce the required amount of side-frame equalization. It is apparent that Mr. Bullock has overlooked this feature of the arch-bar truck.

On the Pittsburgh Railways we have observed, in practical operation for nearly two years, arch-bar trucks of the type described (with swing-link bolster construction) in high-speed interurban service. In the same service there are trucks of the equalizer-bar type illustrated in Fig. 4 of Mr. Bullock's article. The former truck operates with less noise and discomfort to the passengers than the latter type, and since the former is less than one-half the weight of the latter, it is reasonable to expect that the hammering on the rail joints because of the lighter weight will be less than that of the heavier type of truck. F. R. PHILLIPS,
Superintendent of Equipment.

EAST LIVERPOOL TRACTION & LIGHT COMPANY
EAST LIVERPOOL, OHIO, May 4, 1917.

To the Editors:

In his article on trucks, which appeared in the ELECTRIC RAILWAY JOURNAL for April 21, S. A. Bullock says that "it is desirable that all trucks be equalized," and since the writer's experience is in support of this statement, the following comments are submitted, these being confined to trucks of the arch-bar construction.

It seems that the use of arch-bar trucks in electric traction was brought about by the light weight made possible with this construction and by their adaptability for low-floor cars, and it is in such service that we are using them.

With the rigid type of construction which involves journal boxes bolted to the truck frame, the axles are parallel to each other so long as track conditions are perfect; but every electric traction line has more or less bad track with its low joints and irregular surface. It is evident that the two axles of a truck cannot remain parallel to each other in passing over such irregular surfaces, for if the truck frame were rigid enough to keep the axles parallel under such conditions one of the wheels would leave the rail when passing over a depression such as a low joint. Since there is no provision for meeting these conditions in the arch-bar type of truck, the truck frame is subjected to constant strain and torsion in order to permit the wheels to follow irregularities in the track.

This constant twisting and strain, together with the vibration transmitted from the wheels because there are no springs over the journal boxes, results in bolts working loose and bolt holes wearing, which means increased cost of maintenance.

We have found that, where trucks have side-frame equalizers, there is practically no trouble with truck frames working loose or wear of bolt holes. The frames of such trucks remain true to the position in which they were erected and require little attention as the flexibility secured by the equalization of both bolster and side frames relieves the truck frame of many of the strains to which it would otherwise be subjected.

We are convinced, therefore, that trucks without proper equalization do not successfully meet the requirements of electric passenger car service.

C. N. PITTENGER, Master Mechanic.

Employees' Service Periods in Iowa

The Ottumwa (Iowa) Railway & Light Company has compiled some interesting statistics relative to the number of years employees have been connected with the company. These records show that out of a total of 116 employees seventy have been with the company five years or more. The complete tabulation is as follows: Two men employed twenty-five years and over, six men employed twenty to twenty-five years, nine men employed fifteen to twenty years, nine men employed ten to fifteen years, forty-four men employed five to ten years, thirty-two men employed one to five years, fourteen men employed less than one year.

A copy of President Wilson's proclamation, calling upon all citizens to "do their bit" in helping to win the war, will be placed in the hands of every one of the 250,000 employees of the Pennsylvania Railroad system.

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Getting Rail-Head Contours

Home-made Scribing Machine for Recording Worn Rail Heads Proves Effective for Rapid Work

BY W. R. DUNHAM, JR.
Engineer Maintenance of Way The Connecticut Company, New Haven, Conn.

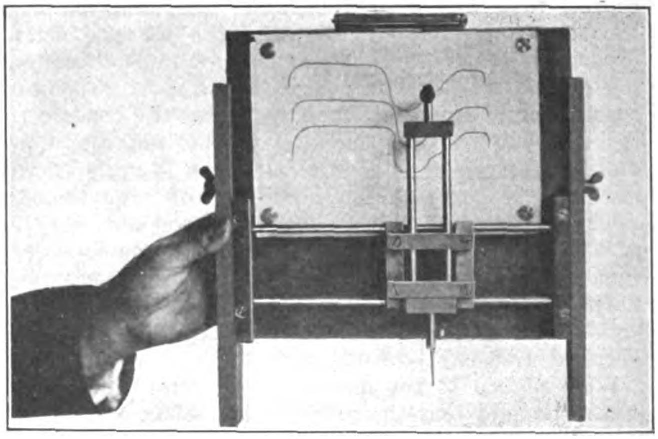
In connection with making scribings of rail heads in pavements to determine the average contour, the only method previously known to the writer before he had to cope with the problem was that of applying plaster of Paris. This seemed to be a slow method where scribings from a large number of rail heads were to be taken. He, therefore, designed and had built in the shops of the company a simple machine which worked out effectively and it seems as though this machine could be used to advantage by other members of the American Electric Railway Engineering Association in investigating not only rail heads but wheel contours.

Briefly, a piece of ½-in. board, 9 in. x 10 in., was used as a drawing board and set vertically with a spirit level on the top to insure the paralleling of the base of the rail and the base of the graph, on the assumption that the base of the rail was horizontal. On both edges were movable legs to permit the setting of the board with the top edge level across the rail to be scribed and to allow for variations in the pavement elevations on either side of the rail heads. At the base of the board two parallel brass rods were attached, these rods running lengthwise and placed ⅜ in. from the face of the board. The purpose of these rods was to furnish a guide for a brass frame moving across the board parallel with the top edge.

This carrier has two brass rods, placed vertically at right angles with the horizontal rods and free to move up and down. At the bottom of these rods provision was made for a long needle point for tracing the contour. The top of the carrier was provided with a pencil point for transferring the outline of the traced surface to a paper attached to the board. The four brace rods and carrier provide for horizontal and vertical movements, permitting accurate contours to be made in one or two minutes each.

A pencil line drawn parallel with the top edge and another near the left vertical edge furnish reference lines for setting the paper. For reference in making the contour, the back edge of the rail can be determined to compare with the original section (as given in the manufacturer's catalog), and also the lip of the tram or groove can be used for a check.

If it is desired to use this device for determining the vertical wear on rail heads accurately it will be necessary to take up enough pavement to permit calipering of the thickness of the head. However, on the rails which we scribed the wear on the trams was so slight that we assumed it to be negligible for our purpose. This was not to determine the amount of metal left in the head but only the form of the contour.



INSTRUMENT FOR TRACING RAIL CONTOURS

The cost of the machine described was trifling compared with the value of the time needed for taking contours with plaster of Paris. Although the writer has never seen an instrument of this kind before making this one, he has since seen a description of one made by Holt of Leeds, England. This, however, gives the section reversed and upside down, while the machine described gives the surface direct. In closing the writer wishes to give credit to his assistant, A. L. Donnelly, and James Dooley, master mechanic of the company, for their co-operation in developing this instrument.

Valuation of Track Special Work

The Author Advocates the Appraisal of Special Work by Elements Rather Than as a Whole

BY A. R. BAILEY
Assistant Professor Civil Engineering, University of Michigan

It has been the practice on many electric railway appraisals to handle all track special work by layouts—that is, by making an inventory of all the layouts of each type on the system and then applying a price per layout. This is a simple method but one that does not seem fair when considered from all possible viewpoints. For instance, if cost of reproduction-new less depreciation is wanted, then for the average property the method would not be fair, either to the public or to the company. This condition of unfairness is sure to result when a flat rate is applied to a layout, which in the great majority of cases is composed of units in varying stages of decrepitude.

Special work layouts are not always renewed in entirety but by piecemeal as the parts wear out. A new switch is installed, later a frog is replaced and so it goes until, if the layout is a large one, many new parts have been added. Originally or at some time perhaps, all the elements of the layout may have been installed at once but they do not wear uniformly; in fact, excessive wear may occur in one element and not in others, which means that the layout will contain at any time parts varying in condition from new to scrap.

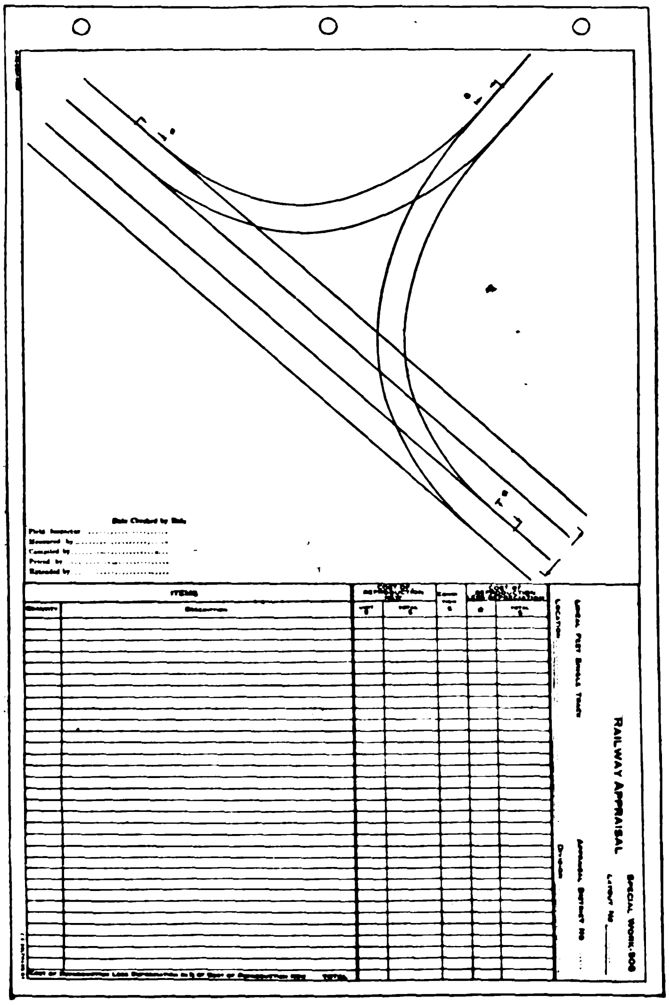
It may be true that considering a property as a whole the total values will be about the same whether the track special layouts have been handled by cost per layout or by the method of treating each part separately. It will be more difficult, however, to substantiate the former method in court or before a commission than it would be the latter method.

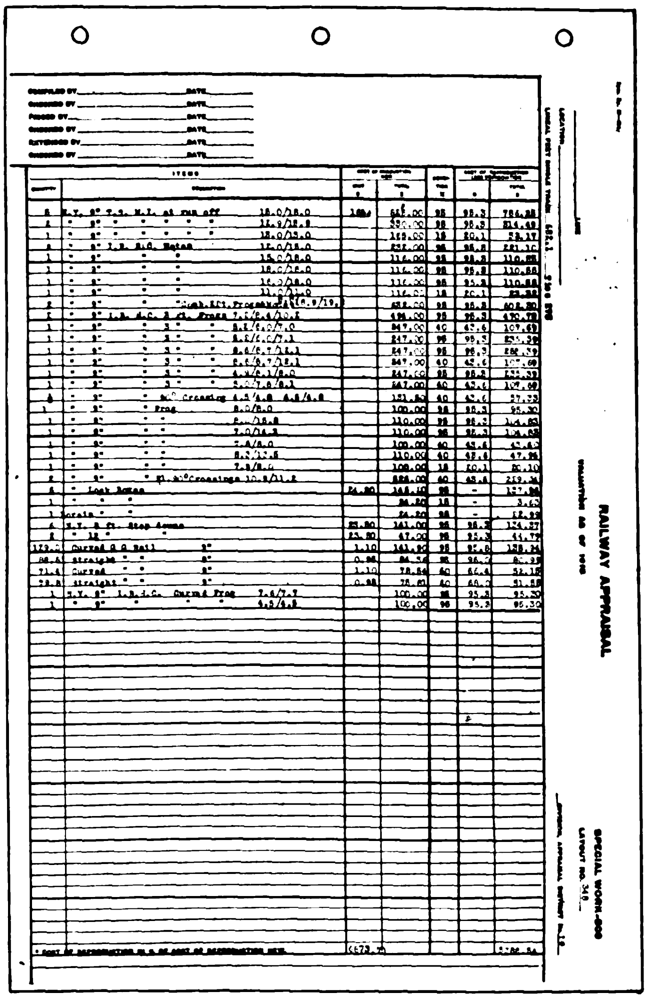
This method, which consists in treating the layout by elements, has been used in appraising properties having an aggregate of more than 2000 layouts, which is ample evidence that it has received a thorough trial. The underlying principle developed was to inventory and price the various parts or units of each layout—that is, the frogs, switches, mates, connecting rails, and spring and lock boxes. In order to prepare for the field work, sketches were made of each layout on sheets 11 in. x 17 in. Typical layouts such as branch-offs, crossings, turnouts, crossovers, and plain curves required only one sketch of each type. This was made on tracing cloth, from which could be made as many prints as desired. The layouts at carhouses and yards as well as for the large and complicated locations were sketched on thin paper by a draftsman in the field. These were later inked in without further work as soon as the sheets reached the office, after which three prints of each were made.

Triplicate prints of the sketches were required for each layout—one being used for the measurements, a second for paving measurements and notes, while the third was used for recording the notes taken by the track inspector concerning the names of the parts, manufacturer and physical condition. It is obvious that all these data could not be shown clearly and completely on the same print, and furthermore it was many times found very convenient in the office to have the data shown on separate sheets. From this it is clear that every piece of special work was actually measured and the measurements recorded on the sketch so that they can be identified at any time.

Samples of these forms, as used, are shown in the accompanying illustrations. In the one containing the diagram about one-half the sheet was used for the sketch while the remainder was used for listing and pricing the various parts. When the layout was so large that it could not be sketched on one of the regular forms a whole sheet was used for the sketch. In the case of carhouses and yards one sheet was used as a key sheet showing the general plan and how it was broken up into pieces for treatment on separate sheets. For such layouts the elements were listed and priced on a sheet expressly provided for the purpose. This is shown in the second illustration. The numbers following the description of the unit, such as 15/18, indicate the length of the unit. The quantities in the column under the star are the numbers by which the costs-new are multiplied in order to get the cost of reproduction-new less depreciation.

In this manner the scrap value was taken care of and the office work was much simplified. All of the computations were made by comptometer operators and were performed much more quickly and cheaply than by engineers or clerks.


RAILWAY APPRAISAL
SPECIAL WORK


RAILWAY APPRAISAL
SPECIAL WORK

SAMPLE FORM USED IN RECORDING SPECIAL WORK DATA LIST AND PRICE SHEET USED IN RECORDING DATA OF ELABORATE LAYOUTS

Railway Practices in Supplying Commercial Energy

Character of Load Connected and Construction Details of the Des Moines Inter-Urban Railway Commercial Substations Are Described

BY F. C. CHAMBERS
Electrical Engineer Inter-Urban Railway, Des Moines, Ia.

It is the policy of the Inter-Urban Railway to establish a commercial light and power business in conjunction with the operation of its 74-mile railway system. At present the commercial business is represented by approximately 4 per cent of the total output of the generating station of the Des Moines City Railway, from which the Inter-Urban buys its power, or approximately 14 per cent of the total power used by the Inter-Urban Company. Development of this business covers a period of approximately three years, and it is safe to say that the business will more than double in the next three.

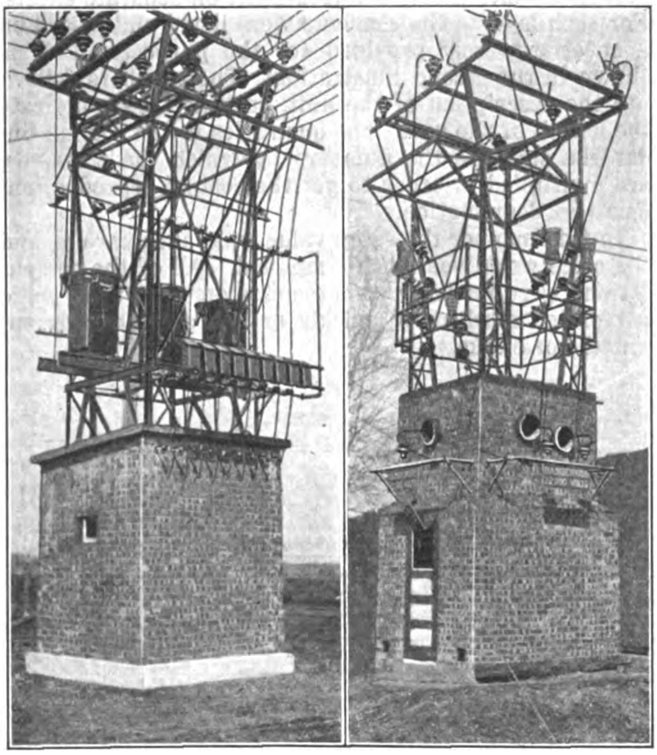


FIG. 1—TYPICAL OUTDOOR-TYPE SUBSTATION SERVING SMALL TOWNS ALONG RAILWAY ROUTE. FIG. 2—SPECIAL TOWER FOR INTER-CONNECTING FORT DODGE AND INTER-URBAN POWER SYSTEMS

In so far as possible the lighting business is a wholesale one, the retail lighting representing but a small portion of the total. The power business, on the other hand, is thus far sold on a retail basis. To date, light and power are being furnished to six small towns either on the right-of-way or a short distance from it. The power business is confined at present to supplying several coal mines, a gravel pit and washer, and a large canning factory, each of which requires from 6000 to 25,000 kw.-hr. per month.

Three of the towns located on the line are supplied from outdoor substations with three-phase, 440-volt, 25-cycle energy. Three towns which are some distance from the right-of-way are supplied from similar stations with 4400-volt, three-phase current. In these cases an auxiliary 4400-volt line, owned and maintained by the consumer, carries the energy from the station on the right-of-way to the town supplied. The coal mines and gravel pit are supplied from branches of the 22,000-volt transmission line paralleling the track, with substations in these cases located immediately adjacent to the mine or pit.

One of the substations in use is shown in Fig. 1. The tower is built of galvanized-steel angles and channels and iron pipe. The equipment was furnished entirely by the Delta-Star Electric Company, and was shipped knocked down to the point where it was to be erected. The high-tension entrance to the tower is at the top, through an air-break switch which is operated by a lever at a point approximately halfway between the base and the top of the tower. Lightning protection is provided through an ordinary horn gap and choke coil, the steelwork being solidly and permanently grounded. The tower is provided with three mast arms to facilitate the removal of transformers for repairs, etc. The steelwork at the base is set in concrete 4 ft. deep. This concrete provides a foundation as well as a floor for the small brick building at the base, which is built up of a single tier of red paving brick laid in cement mortar and plastered on the inside.

The roof is a 4-in. reinforced concrete slab. A clear wire-glass panel in the door and small frosted wire-glass windows provide plenty of light for the interior. Ventilation is secured through iron gratings in the front wall and cast-iron ventilator caps in the roof at the opposite side. This structure houses the metering and distribution panels and the necessary instrument transformers. The main panel supports an inverse time-limit overload relay, a three-phase Thomson watt-hour meter, and an oil-break switch. On the distribution panel are mounted three 100-amp., double-pole, single-throw knife switches for lighting service and one three-pole, single-throw knife switch for three-phase power distribution.

SUBSTATION CONSTRUCTION COST (FIG. 1)

One steel tower, f.o.b. cars Des Moines	$400.00
Loading and hauling material	18.76
Foundation, labor and material	71.88
Erecting tower, labor	84.29
Connecting and cutting in	7.31
Finishing	42.98
Setting transformers	41.92
Brick structure, material and labor	150.00
Metering equipments, etc., installed	150.00
Transformers, three, 20 kva	500.00
Total	$1,467.14

The above arrangement is characteristic of all the commercial substations along the line, except that in some cases the feeder panels are omitted. The load in these small towns usually includes a few small motors, but is lighting for the most part. In some cases a motor is used to pump the town's water supply, and there is usually a grain elevator requiring from 5 to 15 hp. The normal consumption at these places is from 1000 to 3000 kw.-hr. per month.

One of the coal mines having a lift of 335 ft. is equipped with a 225-hp. maximum, intermittent-duty, variable-speed hoisting motor, a 25-50-hp., two-speed fan motor, and several smaller pump motors. Electric locomotives for haulage and mining machinery are being installed. The capacity of the mine is 125 tons per hour, but it is operating at present at one-third capacity, with a consumption of between 10,000 and 12,000 kw.-hr. per month. Operating at full capacity, the load at this point will be more than trebled.

A gravel pit operating eight months per year at a capacity of forty cars of washed gravel per day with a power consumption of 25,000 kw.-hr. per month is undergoing changes which in the next year will increase its output by one-third with a proportional increase in power consumption. This industry is reached by a spur from the main line of the Inter-Urban and thus affords valuable freight business.

The power consumption at the canning factory varies from 3000 to 15,000 kw.-hr. per month according to the season.

That the enterprise of supplying commercial energy is a growing one is evidenced by the fact that the commercial output has increased from 2800 kw.-hr. in May, 1914, to 73,200 in September, 1916.

Fig. 2 shows a standard tower arranged to accommodate a 22,000-volt sectionalizing switch and metering and remote-control equipment. Through this station, power is either supplied to or taken from the transmission line of the Fort Dodge, Des Moines & Southern Railroad. The oil switch is operated by a solenoid remotely controlled from a substation 3 miles distant, power being supplied to the closing coil direct from the 600-volt trolley wire. It will be noted that the arrangement of this tower has been changed to accommodate both an incoming and outgoing line of high potential by eliminating the air-break switch at the top of the tower. Entrance is made to the building through choke coils and disconnecting switches mounted on insulators secured to pipe frame work, and thence through plate glass disks cemented into the 12-in. sewer pipe bell built into the walls. Lightning protection is afforded by the installation of horn gaps at the top of the tower.

The rate made to the small towns is based on a fixed charge plus a flat energy charge. Rates made to the industries are based on a demand charge plus a flat energy charge.

Home-Made Trolley Wheels on Key Route System

Owing in large measure to its distance from the Eastern markets, the San Francisco-Oakland Terminal Railways does much brass foundry work. This includes the manufacture of 5½-in. diameter trolley wheels. These wheels are made up as follows: Copper, eighty-eight parts; tin, ten parts; zinc, two parts. To a 200-lb. bath of new metal, it is customary to add 100 old trolley wheels which average about 2¾ lb. each when discarded.

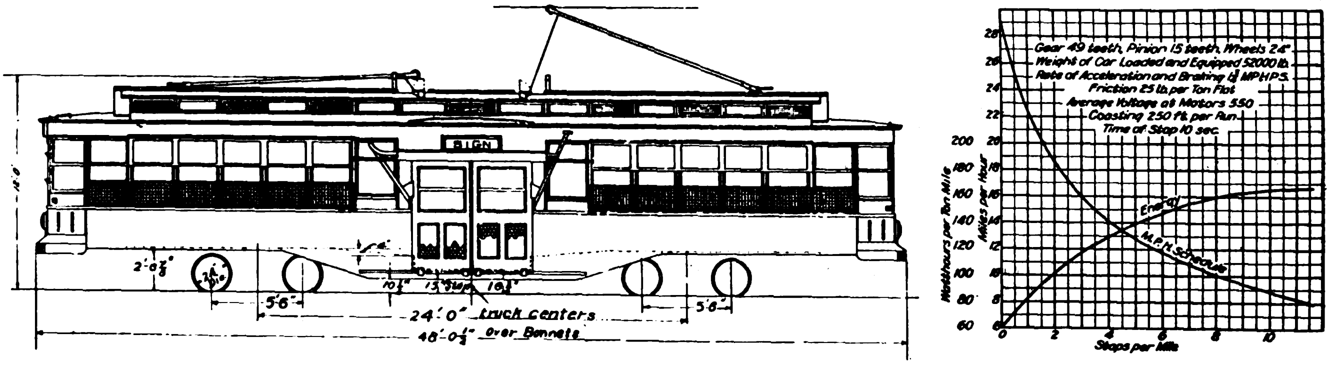
The formula mentioned was originally that of the company's bushings. As these bushings outwore the wheels, it was decided to try the same composition for the entire wheel. The average life of wheels, with a base tension of 18 lb. to 19 lb., is 9000 miles. One early wheel on exhibit in the office of George St. Pierre, superintendent of equipment, made 9411 miles before being scrapped.

Low-Floor Multiple-Unit Cars for Boston

One hundred center-door motor cars are soon to be placed in service by the Boston Elevated Railway, and the designers have incorporated in the construction a number of interesting features, aside from the use of 24-in. wheels whose value has been demonstrated in Boston through their use with the trail cars purchased about one year ago for use in rush-hour service on several lines where operating conditions made this desirable.

For the car body the most prominent feature appears in the unusual arrangement of trolley poles, which reflects the experience obtained with the company's articulated cars. Contrary to the general custom, the active trolley pole serves the front end instead of the rear end of the car, the base being located ahead of the truck and the pole extending backward toward the center of the car. Thus control of the pole is placed conveniently in the hands of the conductor stationed in the central well, since the trolley rope is extended down through a hatch in the roof and is made fast inside of the car.

No doors are provided other than those at the center, and these are 6 ft. 6 in. wide. The sliding panels are pneumatically operated and are controlled through a valve which in turn is moved as desired by the conductor through a system of levers. The entrance step at the threshold is 15 in. high, and the center well is ramped toward the center to give a rise of 1¾ in. The step at either side of the entrance well is 10 in. high and there is a 4-in. ramp leading up to the main floor level, which is 30⅞ in. above the rail.



LOW-FLOOR CAR FOR BOSTON ELEVATED RAILWAY; SPEED-ENERGY DIAGRAM

High schedule speed is expected from the equipment, and in consequence four GE-247 motors, rating 40 hp. at 600 volts, have been installed, this type of motor weighing 1730 lb. complete with gear cover and gear. The service for which the car is designed includes an average number of stops per mile approximating five and one-half, with an average duration of stop of ten seconds, but it is expected that a schedule speed of 11.5 m.p.h. will be maintained, including layover time. The runs in question, it may be said, include about 3½ miles of operation in tunnel and about 5 miles of operation on the surface for each round trip. One of the accompanying illustrations shows the theoretical possibilities in the way of schedule speeds that are the result of this propulsion equipment.

To carry out the plan of rapid car movement, automatic starting signals and automatic coupling of cars for train operation have been provided. The control is automatic, and by the use of the PC-5 control equipment, in which the contactors are mechanically operated by cams on a shaft, a definite frequency in contactor operation is insured and the complications of interlocking for automatic control have been avoided.

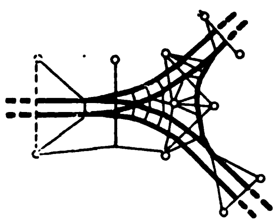
Cost of Erecting Overhead Work—VIII

(From the records of a large Eastern company)

The following is the eighth group of a series of diagrams with figures to show the actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. The preceding groups of this series were published in the issues for Jan. 20, page 127; Jan. 27, page 173; Feb. 10, page 260; Feb. 24, page 355; March 10, page 447; March 31, page 606; and April 14, page 702. The remaining groups of this series will be published in later issues of this paper.

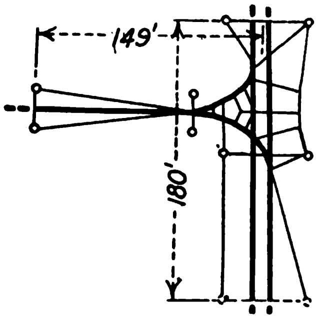
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Double track "Y" with single track connecting curve, angle 90 deg.



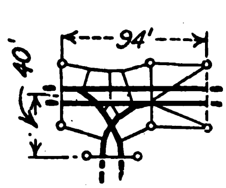
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
54*	$54.45	$39.60	$63.53	$46.20	$72.60	$52.80

Single track right-hand branch-off and single track left-hand branch-off, crossing single track and forming single track "Y" into single track branch line, angle 90 deg.



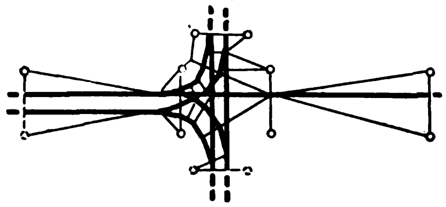
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
55*	$45.38	$33.00	$54.45	$39.60	$63.53	$46.20

Single track right-hand branch-off crossing single track and single track left-hand branch-off crossing right hand into double branch line, angle 90 deg.



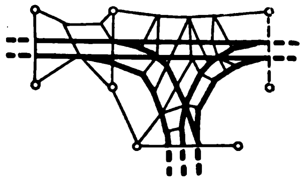
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
56	$31.90	$13.20	$39.88	$16.50	$47.85	$19.80

Double track three-part "Y" with single track through connection, angle 90 deg.



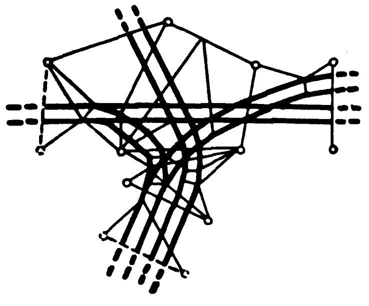
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
57*	$54.45	$39.60	$63.53	$46.20	$72.60	$52.80

Double track three-part "Y", angle 90 deg.



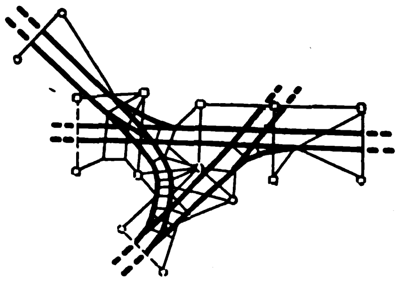
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
58*	$54.45	$39.60	$63.53	$46.20	$72.60	$52.80

Special double track, three-part "Y" crossing a double track



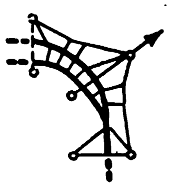
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
59*	$72.60	$52.80	$90.75	$66.00	$108.90	$79.20

Special double track three-part "Y" branch-off crossing double track combined with double track crossing with single track connecting curve.



	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
60*	$72.60	$52.80	$90.75	$66.00	$108.90	$79.20

Single track plain curve with single track left-hand branch-off, angle 90 deg.



	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
61	$23.93	$9.90	$31.90	$13.20	$39.88	$16.50

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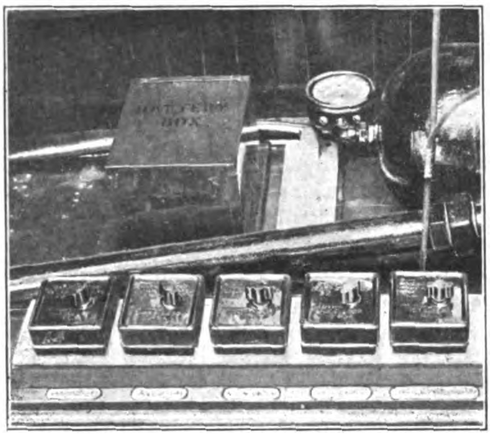
*Trucking includes cost of extra reel truck. None of the figures on this page includes cost of superintendence and engineering.

Marking Car Switches to Distinguish Circuits

BY C. L. KELLER
Assistant Master Mechanic Detroit United Railway

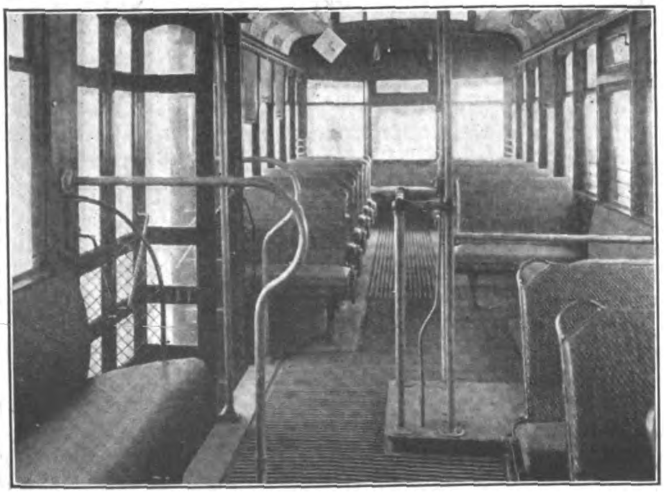
Owing to the fact that the General Electric snap switches controlling the lighting, signal, air compressor, etc., circuits installed in our cars are of the same type and identical in appearance, we have found it advantageous to designate what each switch controlled. Trainmen have frequently turned off the signal switch at the same time they turned off the lights, and then because the signal between trailer and motor car would not operate, would turn the car in for defective signals. This has been eliminated by making a small nameplate which is tacked just below each switch. These are the same as are used in marking our foundry patterns so that the number will stand out on the casting, and the same stencil press is used so that very little expense is added. These stencils have been installed on all cars and have been appreciated by the trainmen.



STENCIL MARKING OF CAR SWITCHES

Railings Aid Prepayment Fare Collection in Des Moines Car

The railings shown in the accompanying illustration were installed in the Des Moines (Iowa) City Railway low-floor cars after experience had demonstrated that the wire mesh guards at the end of the seat and adjacent to the door well were not sufficient during rush hours to prevent passengers from reaching their seats without paying their fares. It being found that while one passenger would be paying a fare and the conductor making change, another passenger would edge around behind the one paying and get past the conductor. The railing on the entering side extends far enough into the center of the car to prevent passengers from getting by the conductor without being noticed. The railing on the exit side of the door well was installed to give passengers a hand hold while waiting to get off, since there was some danger of their being pinched or bruised by the door if they took hold of the wire guard.



RAILING INSTALLED TO PREVENT LOSS OF FARES

Portable Automatic Substation for Kansas City Railways

Simplified Diagram of Connections Is Shown by Which the Different Steps in the Operation Can Be Readily Followed

The Kansas City (Mo.) Railways has purchased a portable automatic substation which will be delivered in July. In describing the operation of this substation, the railways' company publication uses the diagrams shown herewith which are simplified to such an extent that the different steps in the operation can be followed without any difficulty.

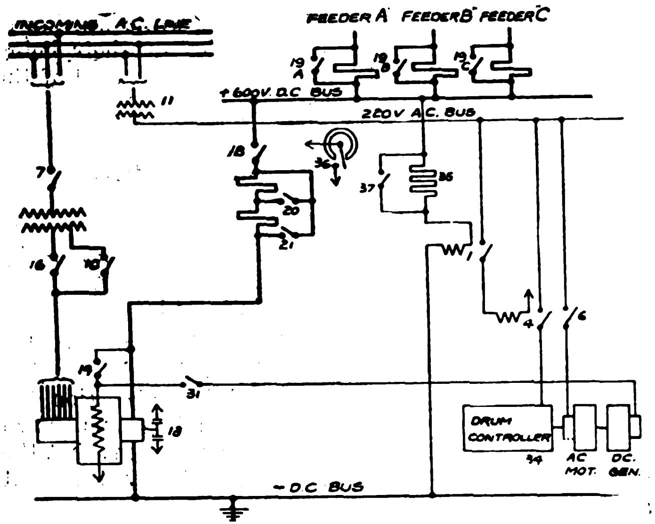
When the potential on the d.c. bus falls below a predetermined amount, 450 or 500 volts, a contact-making voltmeter closes switches 1, 4 and 6. This starts the motor-driven drum controller which in turn actuates the operating switches of the substation. The first controller position closes the oil switch 7, on the incoming a.c. supply. The second position closes switch 10, which places the converter on the starting taps of the transformers. After synchronous speed has been reached the momentary closing of switch 31 places the field of the converter across the terminals of the d.c. exciter long enough to fix the correct polarity. The fifth controller position closes the field break-up switch 14, placing the shunt field of the converter directly across its armature, and 16 is also closed, putting full a.c. voltage on the converter. Switch 18 is next closed. This connects the positive terminal of the converter with the positive d.c. bus through two sets of resistances, which are notched out by the next two positions of the controller. The ninth and final controller position opens switch 6, which stops the controller driving motor.

Sequence	Device Number 1	4	6	7	10	13	14	16	18	A 19	B 19	C 19	20	21	31	36	37	Remarks
1-Shut Down										O	O	O					O	Controller Off
2-Low D.C. Voltage	O	O	O							O	O	O					O	Controller Starts
3-1st Controller Position	O	O	O	O						O	O	O					O	Oil Switch Closes
4-2nd Controller Position	O	O	O	O	O					O	O	O					O	Starting Tap
5-3rd Controller Position	O	O	O	O	O	O				O	O	O					O	Sychronous Speed
6-4th Controller Position	O	O	O	O	O	O				O	O	O			O	O	O	Polarity Fixed
7-5th Controller Position	O	O	O	O		O	O	O		O	O	O				O	O	Full Volts-Self Excited
8-6th Controller Position	O	O	O	O		O	O	O	O	O	O	O				O		All Resistance In
9-7th Controller Position	O	O	O	O		O	O	O	O	O	O	O	O			O		Part Resistance Out
10-8th Controller Position	O	O	O	O		O	O	O	O	O	O	O	O	O		O		All Resistance Out
11-9th Controller Position	O	O		O		O	O	O	O	O	O	O	O	O		O		Controller Stops Run
12-Light Overload Feeder "A"	O	O		O		O	O	O	O		O	O	O	O		O		19 B or 19 C Open On
13-Medium Overload Feeder "A"	O	O		O		O	O	O	O		O	O	O			O		Feeders B or C
14-Heavy Overload Feeder "A"	O	O		O		O	O	O	O		O	O				O		Correspondingly
15-Underload			O	O		O				O	O	O				O	O	Controller Starts
16-Shut Down										O	O	O					O	Controller Stops Off

DIAGRAM SHOWING SIMPLIFIED CONNECTION OF POWER AND CONTROL APPARATUS OF AUTOMATIC SUBSTATION

Instead of using circuit breakers to protect the d.c. feeders, resistances *A*, *B* and *C* are provided. The resistance short-circuiting switches, 19*A*, 19*B* and 19*C*, will operate on light overloads, medium overloads will open switch 21, which inserts an additional resistance, and on heavy overloads switch 20 will also be opened.

When the d.c. line voltage rises so that the current supplied by the substation falls below a predetermined minimum, switch 37 closes and through relays not shown in the diagram, and switch 6, starts the driving motor of the controller. The latter then revolves to its original position, at the same time opening the necessary switches for shutting down the station.



POSITIONS OF DRUM CONTROLLER FOR OPERATING AUTOMATIC SUBSTATION

These are in brief the operations of starting and stopping the automatic substation. There are additional relays for protection against short-circuits in the station, and thermostats are located in the bearings and windings of the converter so that if any overheating occurs relays will operate to shut down the station.

Cupping of Rails at Junctions with Special Work

An engineer connected with the way department of one of the large electric railway companies reports certain experience with the cupping of open-hearth rails at their junctions with the hard centers in special work. This company was having considerable trouble with the breaking of rail ends abutting hard centers in crossing frogs, and the gouging out of the rail heads on curved special work. This was attributed to the difference in wearing qualities of the manganese centers and the open-hearth steel in the rail. In several special work layouts heat-treated Mayari steel was specified for the centers, and these layouts have now been in successful use for two years or more.

In one case Mayari steel centers were specified in the four frogs of the single-track curved crossing formed by the outer curves of a double-track wye. The rails in the former crossing, which had the harder centers, had been gouged out after two and one-half years' service to such an extent as to make renewal imperative. After two years with the softer centers no gouging is evident and the centers are still in good condition, the maintenance expense being zero to date.

The explanation of this phenomenon of gouging is probably that as the abutting rail wears away faster than the hard center, there is a tendency for wheels to jump from the center to the rail, making a depression. Having been started such a condition tends to become worse as the wear increases.

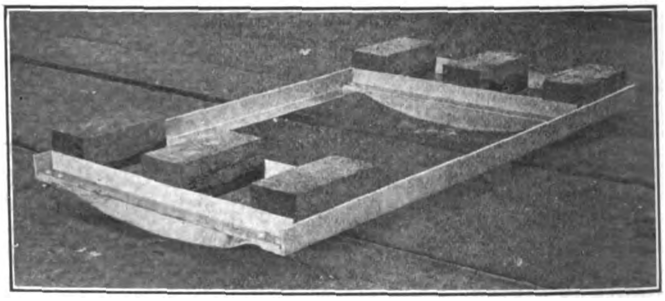
On this railway the same type of center was specified in a double-track 90-deg. crossing which was installed in the fall of 1914. Here the rail abutting on the centers does not as yet show any of the signs of pounding which, according to the company's engineers, is often found to occur with hard steel centers. Mayari steel was also specified in frogs of a double-track branch-off constructed in the fall of 1914 and this also shows very uniform wear.

Substitute Tie for Heavy Service

At the recent convention of the American Railway Engineering Association attention was called to the numerous attempts that have been made to produce a suitable substitute for wooden ties in steam railroad track. Many of these have proved unsatisfactory, apparently because of the difficulty of getting sufficient flexibility of track when the ties are composed altogether of steel and concrete.

To meet this difficulty the International Steel Tie Company, Cleveland, Ohio, has recently brought out a new form of substitute tie in which only a small amount of wood is used to give flexibility, and the requirement of timber is but a fraction of that obtaining when standard wooden ties are used. Thus there is offered an opportunity to relieve the excessive drain upon the timber resources of the United States that has been so much in evidence within past years. The tie is a modification of the well-known twin-steel tie, being built up of angles and warped plates 3/8 in. in thickness, with creosoted wooden blocks to receive the rail. The plates are warped in from the two sides, which gives them vertical strength and forms a tamping pocket in the ballast underneath. Two angles spaced 12 in. back to back are riveted to each plate to form a pocket for receiving three 6-in. x 8-in. x 12-in. creosoted oak blocks. The rail is fastened to these blocks with cut spikes.

This combination of material forms a rugged tie that is perfectly insulated for track circuits. Long life of track is insured by the thickness of the steel composing the tie, and when the wooden blocks fail mechanically renewal is simple. This tie replaces two wooden ties and furnishes 8 sq. ft. of bearing area on the ballast.



COMPOSITE SUBSTITUTE TIE FOR USE IN OPEN TRACK OR IN LOCATIONS WHERE INSULATION IS DESIRED

Various modifications of the design are furnished, including one to provide different lengths for the wooden blocks for supporting a third-rail insulator. Its special advantages are opportunity for use in street crossings where insulation between the rails is desired on account of the existence of signal circuits. It serves also as a substitute tie in open track, being installed under these circumstances with ballast tamped underneath just as if the track were supported in the customary manner. The tie, however, may be used in paved streets with a concrete base to give the rigidity that is necessary under these conditions to avoid destruction of the pavement by the working of the rails.

London Letter

Problem of Male Help More Pressing—Results of Shildon and Newport Electrification—Another Bakerloo Extension Opened

(*From Our Regular Correspondent*)

There are various indications that tramway managers are about to have further strains put upon them in the very near future in regard to employees. The list of certified occupations of Nov. 20, 1916, has been revised with a view to releasing more men for the army. The principal alteration in the new list is that the age limit for married men has been raised from twenty-five years to twenty-seven years. Men under the age limits who are classed in category B (1), *i.e.*, for garrison duty abroad, are no longer entitled to be treated as in a certified occupation, as they were in previous lists, and a further list is promised shortly in which the reservations will be reduced by a further raising of the age limits, and doubtless a further lowering of the categories. A significant sign of the times is the decision of the home office to authorize the London commissioner of police to license qualified women to be drivers of public vehicles, including tramcars. Reports are being received that women are giving satisfaction in spite of unfavorable climatic and dense traffic conditions. It is also alleged that no difficulties have been experienced at gradients nor has the operation of brakes had unfavorable results where women have been used as drivers. This testimony, as well as the action of the Metropolitan police, will necessarily influence the authorities, and managers may be faced with the alternative of curtailment of services or employment of women drivers.

The results of the Shildon and Newport electrification seem to have satisfied the board of the North Eastern Railway. The board financed this work out of revenue, in order to be on the safe side, but the experience of more than a year's operation has justified the placing of £100,000 of the expenditure to capital account, so the chairman informed the recent general meeting of the stockholders of the North Eastern Railway. Whence it may be reckoned that it promises to result in a revenue benefit of perhaps £6,000 to £8,000 per annum. The importance of the case is that it is the first instance in this country of the electrification of a line carrying goods and minerals on a large scale.

The Liverpool Overhead Railway, which was rather hard hit by tramway competition, had a record traffic for the year 1916. It was no less than 26 per cent better than in 1913, and is still growing.

The suggestion made a little time ago of the desirability of linking up Keighley with Bingley and the Bradford tramway system, inspired in all probability by the greater use now being made by the public of the tramway services, is still under consideration. Recently a friendly and informal conference of representatives of the Keighley Town Council and the Bingley District Council was held on the subject, and the matter will be talked over with the Keighley Rural District Council, in whose area the linking-up line would have to be made. At present the Keighley tramway system stops a little short of the bridge over the Aire at Stockbridge, and the bridge itself will have to be altered if a tramway is to cross it. The Bingley system also ends a short distance from the boundary at Morton Lane. Between is a gap of 2 miles. The completion of the Bingley line past Ryshworth Hall is held up until after the war.

At a meeting of the Chester Town Council it was decided, because of the shortage of labor and the urgent necessity of repairs, to stop the Sunday tramway service for the present. It was also agreed that the fares should be increased to a basis of 1*d*. a mile, but the 0.5*d*. fare for school children was retained.

The report of the Bristol Tramways & Carriage Company for 1916 states that the gross receipts amounted to £555,907, and the working and general expenses and renewals to £450,447, leaving, with the balance brought forward, a net revenue of £110,515. Of this, interest and dividends absorbed £57,754, and it is now proposed to pay a final dividend on ordinary shares at the rate of 7 per cent per annum, subject to tax, making 6 per cent for the year, and to add to reserve for contingencies and renewals £30,000, leaving £9,635 to be carried forward.

At a meeting of the London County Council it was recommended that the question of expediting the repayment of the debt in respect of obsolete capital expenditure outstanding on the horse tramways be postponed for a further three years, unless any surplus be available earlier for the purpose after the reserve fund has been made up to the full amount necessary on the basis agreed to. The highways committee was reported to be of the opinion that in the present circumstances no useful purpose would be served in attempting to settle the basis of the provision to be made for renewals.

The report of the electric supply committee of the Birmingham City Council includes the detailed report made by Councilors Appleby and Beale on their inquiry into the causes of the recent interruptions of electric supply, which led to frequent stoppages of the tramway services of the city. They find that the failures were due primarily to an abnormal demand for current following the outbreak of war, which was greater than the committee could reasonably be expected to have foreseen. The increased demand came at a time when the department was least able to meet it, and the inability to meet the exceptional situation arose from causes which were not beyond the control of the committee. Following this report is a statement upon it by those members of the committee who have been members since November, 1911, and a statement by the city electrical engineer, who, Messrs. Appleby and Beale state, cannot be absolved from criticism in reference to certain delays. The report, the committee adds, concludes with an expression of grave apprehension as to the immediate future. The demand for current, however, is now being overtaken, but the spare plant is admittedly meager and new connections are constantly demanded. The committee is of the opinion that even now the permanent station should be proceeded with. Plans are in preparation, and in order to allay any anxiety that may be aroused by the observations contained in the report upon the disadvantages of the Nechells permanent site, the committee has asked C. P. Sparks, the president of the Institution of Electrical Engineers, to furnish it with a report.

Sir Albert Stanley, the president of the Board of Trade, has appointed a committee to consider and report on what steps should be taken, whether by legislation or otherwise, to insure that there shall be an adequate and economical supply of electric power for all classes of consumers in the United Kingdom, particularly industries which depend upon a cheap supply of power for their development. The committee is constituted as follows: The Right Hon. F. Huth-Jackson (chairman), H. Booth, James Devonshire, G. H. Hume, John Kemp, H. H. Law, M. I. C. E.; C. H. Merz, Sir Charles Parsons, K. C. B.; Sir John Snell, M. I. C. E.; Alderman C. F. Spencer and A. J. Walker, K. C.

The extension of the Bakerloo Railway from Willesden Junction to Watford has now been opened. This is the sixth extension of the railway since its inception in March, 1906. After coming to the surface at Queen's Park, the Bakerloo trains will run over the electric line of the London & North-Western system to Watford, via Willesden Junction New Station. The extension has increased the length of the Bakerloo run to more than 20 miles, and has added twelve stations to the line of route. It opens up a large area of new residential districts, and connects the northern suburbs with the central, west-end and south-eastern districts of London. In addition, it will give passengers using the London & North-Western system a choice of new terminal stations in London, connecting with main line railways, for the new line joins up Paddington (Great Western Railway), Marylebone (Great Central Railway) and Waterloo (London & South-Western Railway), with Willesden Junction and Watford. Other main-line railways can easily be reached by Bakerloo passengers. By changing at Oxford Circus they can travel to Liverpool Street (Great Eastern Railway); a change at Piccadilly Circus enables them to get to King's Cross (Great Northern Railway), and the Trafalgar Square station is only a minute's walk from Charing Cross (South Eastern & Chatham Railway).

A. C. S.

News of Electric Railways

Traffic and Transportation

Financial and Corporate Personal Mention Construction News

Decision in Tacoma Case

State Commission Refuses to Assume Power to Abrogate Franchise Provisions Considered Unreasonable by Tacoma Railway & Power Company

The State Public Service Commission at Olympia, Wash., on April 27, dismissed the case of the Tacoma Railway & Power Company against the city of Tacoma and refused to assume power or authority to abrogate franchise provisions or relieve a public utility of franchise obligations which have become burdensome, even though it may appear that compliance with those provisions will impair the capital of the company. The decision assures the city of Tacoma $22,000 a year in gross earnings tax, about $4,500 a year in street railway fares for city employees, and the cost of maintenance of paving between tracks and 1 ft. on each side, amounting to about $20,000 a year. The decision of the commission was unanimous in holding the State Board has no power to interfere and grant relief, but each of the three commissioners wrote a separate opinion giving his views on the subject.

COMPLAINT FILED LAST OCTOBER

The complaint of the Tacoma Railway & Power Company was filed last October. In its prayer the company declared that its revenues were insufficient for it to comply with any of the provisions of the city franchise, except to render adequate and efficient service at a fair and reasonable rate. It asked to be relieved of paying its gross earnings obligations and for the maintenance of streets and bridges, and expressed a desire to be relieved of carrying city employees without charge. The company contended that through the "gratis franchise rights" to the jitney bus, the net earnings of the company had been reduced to a point where they were sufficient to do no more than to pay the interest on its indebtedness.

Counsel for the cities of Seattle, Spokane, Everett and Bellingham joined with City Attorney U. E. Harmon of Tacoma in writing the city's brief and in arguing the case before the Public Service Commission. Hugh M. Caldwell, corporation counsel of Seattle, and Walter F. Meier, assistant corporation counsel of Seattle, were among those entered as counsel. When the case was heard orally on Jan. 15, arguments were made by City Attorney Harmon of Tacoma and Mr. Meier. The case was taken under advisement at that time. In a previous case brought by the Puget Sound Electric Company, Seattle, similar release was sought, and in that case the commission held that it had jurisdiction, although there was an understanding that the question of jurisdiction might subsequently be raised.

MATTER IN QUESTION A JUDICIAL ONE

The decision, quoted as follows, covers the questions raised by the city attorney:

"The terms and conditions relating to paving and the bridge expense do not partake of the character of rate or service regulation, but on the contrary relate to adjustment of street paving and bridge construction and maintenance burdens. Whether or not the adjustment of street paving and bridge construction and maintenance burdens is a proper subject to be included in terms and conditions prescribed for the location and construction of a street railway, is a question for the courts to determine without previous action by the commission, for it is purely a judicial one.

"The terms and conditions relating to the gross earnings tax do not partake of the character of rate or service regulation, although such a tax may affect the rate or the ability of the company to render proper service in the same manner that any other tax affects the rate or the ability of the company to render proper service. Whether the Legislature intended to delegate to the city power to levy a gross receipts tax when prescribing terms and conditions for the location and construction of a street railway, is also a judicial question for the courts to determine without action by the commission."

Commissioner Spinning held that the Public Service Commission's jurisdiction over street railways was closely to rate and service regulations, leaving franchise requirements as to paving, bridge construction costs and payment of earnings tax by the company to be determined in court without previous action by the commission. He held that the Legislature did not give the commission the power to grant franchises or prescribe terms and conditions upon which street railways should be operated and constructed, but conferred that power on cities. Such power, if judicially upheld, was authority of equal dignity with the power of the commission regarding tracks and service. Hence, when the city had acted within the scope of its franchise-granting power, it was not for the commission to determine whether the city had exercised its power wisely or unwisely.

Commissioner Lewis concurred in the dismissal on the ground that street railways were limited by law to charge 5 cents. He held that the commission was without power to eliminate any item of operating expense or maintenance of fixed charges of street railways.

Chairman Blaine, in his opinion, said:

"Under the public service act of this State any city or town may become a complainant and at its own instance the commission can proceed against a public service body, but to reverse this order and allow a utility to complain against a municipality would be a procedure which the statute does not seem to contemplate."

SIMILAR PRINCIPLES INVOLVED ELSEWHERE

The decision is regarded as extremely important by other cities, as similar principles are involved in the litigation between the city of Seattle and the company there. The Seattle petition was filed with the commission about two years ago, but it has been held in abeyance awaiting the completion by the commission of a physical valuation of the street railway properties there.

According to a statement of officials of the Puget Sound Traction, Light & Power Company, an appeal will be taken to the Thurston County Superior Court from the decision of the commission.

Following the commission's decision, Commissioner of Public Works Atkins of Tacoma immediately sent a letter to City Attorney U. E. Harmon, asking that he give formal notice to the company to repair the pavement between its tracks. According to Commissioner Atkins, the condition of the streets named presents a continual menace to life.

New York Legislature Adjourns

The New York Legislature adjourned on May 10. It seems likely, however, that a special session will be called to deal with the economic problems growing out of the war. The outstanding features of the session to the electric railways were the defeat of the Thompson bill to reorganize and consolidate the Public Service Commissions and the passage over the veto of Mayor Mitchel of the Ottinger bill giving the Public Service Commission for the First District of New York jurisdiction with the Board of Estimate of New York in relation to the pending contract between the city of New York and the New York Central Railroad for the proposed West Side improvement.

South Bend Men Still Out

Agreements Reached with Interurban Men and Employees in Elkhart and Michigan City, but South Bend Men Refuse Company's Offer

Following the mass meetings of labor unions at South Bend, Ind., to create public sympathy for the strike of the local men of the Chicago, South Bend & Northern Indiana Railway, which was called on April 29, as reported in the May 5 issue of this paper, page 839, strike sympathizers began rioting in the business district of the city about noon on May 2, compelling the company to withdraw all the cars which it was operating. No protection was afforded by the police of the city, and an appeal was made by General Manager F. I. Hardy to Mayor Keller for more adequate protection.

2 CENTS ADDITIONAL TO ELKHART, MICHIGAN CITY AND INTERURBAN MEN

On May 2 Mr. Hardy, in conference with a committee of the trainmen of the interurban lines who had not joined in the strike, effected a settlement of their differences, under which the men were granted an increase in wages of 2 cents an hour, the new scale ranging from 25 to 34 cents an hour for conductors, and 26 to 35 cents an hour for motormen. The demands of employees of the local lines of the company in Elkhart and Michigan City were also adjusted by a compromise between the company and the employees. These men were also granted an increase of 2 cents an hour.

On May 4 an offer of an increase of 2 cents an hour in wages was made to the striking employees at South Bend, but was refused by the men on account of provisions stipulating that the new agreement should be executed by the men as individual employees by 6 p. m. on May 5, and the refusal of the company to deal with the union. Rioting in the city grew worse on May 4, with the attitude of the police tending to aid rather than deter the acts of depredation. Eighteen arrests were made of persons stoning the crews of cars being operated. Mayor Keller issued a proclamation calling on citizens to refrain from gathering on the streets, and warning them to keep moving.

An appeal by the union to the Public Service Commission to act as a board of arbitration as in the case of the Indianapolis strike of 1913 was declined by the commission on account of the law passed by the Indiana Legislature in 1915 providing for an arbitration board to be appointed by the Governor in case of labor disputes and strikes.

After conferring with Governor Goodrich, Sheriff Bailey, of South Bend, assumed control of the situation at South Bend on May 5, and appointed fifty deputies to aid the police.

MEN APPEAL TO GOVERNOR

Governor Goodrich stated that he had received a telegraphic appeal from Claude F. Barnes and Edward Carr, South Bend, whom he inferred were officers of the local union, asking him to appoint an arbitration board under the act of 1915 to investigate and adjust the strike at South Bend. The Governor stated that he had decided to appoint such a board, but that he would not be ready to announce the names of the arbiters until he had been afforded an opportunity of selecting men desirable for such a service.

Mr. Hardy stated on Saturday night, May 5, that he was satisfied with conditions and that through the co-operation of Sheriff Bailey and his deputies full service on the South Bend city lines would be restored by Monday. He added that the striking motormen and conductors might consider themselves as discharged.

The strikers held their second mass meeting on Saturday night, May 5, but no trouble resulted. No arrests were made during the day, but seven persons were arrested at night on charges of throwing stones, inciting riot, etc.

On May 7, Governor Goodrich telegraphed to the officials of the railway and to representatives of the striking trainmen that he intended to appoint arbitrators at the earliest moment possible, and asked that some arrangement be made if possible to resume work pending the appointing of the arbitration board and its investigation of the difficulties —with the understanding that the settlement reached should date back to the appointment of the board.

$46,862,972 Fixed as Portland Value

Public Service Commission Makes Ruling on Portland Railway, Light & Power Company, Portland, Ore.—Rate-Making Basis Set

The Public Service Commission of Oregon on April 30 handed down its valuation order as to the railway, electric utility and gas utility divisions of the Portland Railway, Light & Power Company, determining the value of the company's properties for rate-making purposes at $46,862,971. This valuation is approximately $14,000,000 less than the valuation found by the company's engineers. A set of preliminary findings was issued by the commission about a year ago. The total value of the properties is placed at $55,307,474, as of Dec. 31, 1916. Of this amount the commission finds that $8,444,502 represents non-utility property, leaving a total valuation of the property used and useful to the service of the public of $46,862,971. The apportionment of this value is as follows:

Railway divisions—	
Portland Railway	$18,233,372
Oregon Water Power & Railway	7,402,195
Mount Hood Power & Railway	1,523,454
Total railway	$27,159,021
Electric utility divisions—	
Portland	$17,689,980
Willamette Valley	1,177,005
Vancouver	625,168
Total electric utility	$19,492,153
Salem gas utility	211,798
Total utility property	$46,862,971

In giving its findings at length in the order, the commission estimates the utility will reasonably require in materials and supplies and cash or its equivalent, the sum of $250,000 for the purposes of operation, including its maintenance of non-utility property, allowing $1,110,000 as a working capital for successful operation.

The cost of financing is allowed to remain as it stood in a former order of the commission. At that time the question of an allowance of 1.65 per cent under the head "cost of obtaining money," was considered, but the specific amount was disallowed, the overhead figures adopted in the former findings being deemed sufficient to cover this feature.

An allowance of slightly more than 6 per cent was made to the utility for interest during construction. The commission altered its former findings as to reproduction cost of the underground distribution system, the reproduction cost new as now found on this underground system being placed at $861,593 and the reproduction cost, less depreciation, at $891,385. The commission refused to include park and resort property as utility operating property.

COST OF PROPERTY TO INVESTORS

The cost of the property to present investors up to Dec. 31 is fixed by the commission at $51,001,147, there being added to the former finding $100,666, while the original cost is placed at $40,128,642. The amount and market value of the stocks and bonds of the company, as of Feb. 6, 1915, the latest date for which the record contains information on this point, were as follows:

	Par Value	Market Value
Portland Railway, Light & Power Company 5 per cent bonds, due 1942	$17,064,000	$14,419,080
Portland Railway, Light & Power Company, 5 per cent notes, due 1915	5,000,000	4,962,500
Portland Railway, Light & Power Company 5 per cent bonds, due 1930	8,523,000	8,448,424
Portland General Electric Company 5 per cent bonds, due 1935	8,000,000	7,900,000
City & Suburban Railway 6 per cent bonds, due 1916	87,000	87,000
City & Suburban Railway 4 per cent bonds, due 1930	1,290,000	1,120,300
Portland Railway, Light & Power Company common stock	25,000,000	6,250,000
Totals	$64,964,000	$43,186,304

In outlining the purposes for which the findings of value of the utility are made the commission says in part:

"It would appear that the Legislature, in drafting the act which clothes the commission with jurisdiction over railroads, . . . attempted to provide a means of perpetuating for all relevant purposes the various elements which enter into the various concepts to which the term 'value' has been applied. It is equally clear that in drafting the public utility act the Legislature had in mind the finding of an ultimate figure of value, and since the commission exercises no jurisdiction over the issuance of stocks and bonds, nor questions of taxation, nor proceedings looking to the fixing of values for purposes of sale or exchange, it is evident the 'value' contemplated by the Legislature is the value for rate-making purposes. This value, the commission conceives to be an expression in dollars of the aggregate of many factors, and represents, on the one hand, the amount upon which the utility owner is entitled to base a claim for a return, and, on the other hand, the amount upon which, provided it requires the imposition of no unreasonable, unjust nor unjustly discriminatory rates, the ratepayer should pay a return."

Public Beginning to Appreciate

A recent issue of the St. Joseph (Mo.) *Gazette* contained an editorial entitled "How Do They Do It?" which called attention to the fact that in spite of the increased cost of practically everything which the public must buy, the prices of electric railway transportation and electric lighting have remained constant. The editorial commented on the fact that all items of expense incident to the production of these necessities of modern civilization, including wages, material, fuel, rent, etc., have greatly increased, and yet the local company continues to furnish these commodities at rates which are the lowest they have ever been in that community. It also goes on to say that the conditions existing in St. Joseph are to be noted in most American municipalities, although the editors have noticed that in a few cases the "cut-rate street car books" have been withdrawn. The editorial ends with this comment: "How do the public service corporations supplying these commodities manage to maintain the old prices when the ice man, the coal dealer, the dairy man, the doctor, lawyer, merchant and chief all are boosting the prices of their own wares?"

Washington Men File Brief

A committee representing the striking employees of the Washington Railway & Electric Company, Washington, D. C., has filed its brief with the Senate investigating committee which is inquiring into the conduct of the recent strike. The brief of the company had been submitted previously, as noted in the ELECTRIC RAILWAY JOURNAL of May 5, page 840. The representatives of the men charge that President King of the company was "guilty of bad faith." They review the attempts at arbitration, and charge that the company is endeavoring to deceive Congress and the public with "constant assertions and paid newspaper advertisements that we insist upon a closed shop and an agreement with the Amalgamated Association." The communication asks that a recommendation be made for compulsory arbitration of all such disputes in the District.

The Senate investigating committee arranged to begin its hearings on May 8. The committee planned to sit only in the mornings before the sessions of the Senate and possibly at night if necessary.

Dearth of Help at Cleveland

Many of the motormen and conductors on the Cleveland (Ohio) Railway are giving up their places to go into other work. While the force is as large now as it was at this time last year, more cars are operated. A. E. Duty, general superintendent of the company, said that no cause can be given for the men leaving the service except "the man and the opportunity." Some of the men are going into shops where high wages are paid, while others are taking advantage of the various other opportunities that are offered. Fielder Sanders, street railway commissioner, said the situation is becoming so serious that women may have to be employed as conductors. Mr. Sanders says that if women are employed they should receive the same wages as the men. Mr. Sanders said on April 4 that 217 half trips had been taken off the service during the rush hours, because of the shortage of men. He also estimated that 650 motormen and conductors out of a total of 2500 are between the ages of twenty-one and twenty-seven years, first mentioned as the probable ages for conscription. This introduces still another danger to the service.

It is said that the conductors and motormen will ask the company for an increase in wages because of the abnormal increase in living expenses. Under their working contract the men received an increase of 1 cent an hour on May 1, but they say this will not be sufficient to meet the increase in the cost of food. They say now that the present abnormal conditions could not be foreseen when the contract was made and that the present wages are inadequate to their needs.

Council Approves Enabling Legislation

Power Required by Chicago in Order to Carry Out Traction and Subway Commission's Plans for Unified Transportation System Would Be Had by Passage of These Bills

After debate at which the Socialists and the advocates of immediate municipal ownership tried to influence the vote of the Aldermen by misinterpretation of the traction and subway commission's plans and a plea for no further franchises to utilities the Chicago City Council passed on four important bills for presentation at once to the State Legislature for consideration at the present session. These, if enacted into laws by the Assembly, will give the city the enabling legislation needed to proceed on a final solution of the local transportation problem. The four pieces of enabling legislation which have just been approved by the Council are as follows:

A bill restoring to the city the powers of home rule taken from it by the State public utilities act, and recently upheld by the State Supreme Court.

A bill authorizing the city to grant a thirty-year franchise to a new operating company formed by the merger of the elevated and surface lines.

A bill authorizing the city to construct and operate subways.

A bill authorizing the merger of the companies owning the surface and elevated lines, required because of their incorporation under different laws.

One of the principal reasons set forth by the immediate municipal ownership advocates as to why no new franchise grant should be given was the "rotten deal" the people had received as a result of the surface lines' operation under the 1907 ordinances. The sincerity of the Board of Supervising engineers was attacked. It was also asserted by the opponents of the legislative program that the members of the Board of Supervising Engineers were dominated by the traction interests.

District Valuations Announced

The Public Utilities Commission of the District of Columbia on May 2 announced complete valuations for rate-making purposes for the Potomac Electric Power Company, the Washington & Georgetown Gas Light Company and the Chesapeake & Potomac Telephone Company. The commission finds the value of the Potomac Electric Power Company, which is controlled by the Washington Railway & Electric Company, as of Dec. 31, 1916, to be $11,231,170. The company had claimed a value of $23,235,387 for its property.

Clarence P. King, president of the Potomac Electric Power Company, said on May 2 that he could not state what steps would be taken by the company until he had opportunity to go over the report. In announcing its findings the commission stated that it would hand down an opinion reviewing the problems presented in each case, within a few days.

This completes the valuation work, except for the properties of the Washington Railway & Electric Company and the Capital Traction Company now under investigation. Consideration of the rates charged for local utility service next is in order.

Chicago Men Seek Wage Increase

Present Contract Expires June 1, and Demand for 40 Per Cent Increase Will Shortly Be Made

The contract under which all elevated and surface trainmen in Chicago have been working expires on June 1. The unions have already prepared a demand for wage increases amounting to about 40 per cent, and also asking for shorter hours. The demand for wage increase will be for a raise from 36 cents an hour to 45 cents maximum during the first year of the agreement, and from 45 cents to 50 cents an hour during the second year. The wage scale at present is from 27 cents an hour to 36 cents distributed through four years.

The hours of work are to be determined on a basic eight-hour day, with a nine-hour maximum. Under the present agreement the men work under a basic ten-hour day. Night car runs are not to exceed six hours, and the men operating on them to receive $3.50 a run. Any runs necessitating more than eight hours are to be paid for at the rate of time and one-half for overtime. The demands will also contain other items as to the detail working conditions.

While the demands of the union have not been formally presented to the companies, their substance is expected to be approximately as itemized above. These are expected to be practically the same for both elevated and surface employees, although definite information on the former has not yet been made public.

Increase in Wages in York.—The directors of the York (Pa.) Railways have authorized an increase in the wages of the 200 employees, varying from 1 cent to 2 cents an hour.

Increase in Wages Sought in Olympia.—A petition, signed by the trainmen in the employ of the Olympia Light & Power Company, Olympia, Wash., requesting an increase of 5 cents an hour in wages, has been presented to L. B. Faulkner, manager.

Negotiations Continue in East St. Louis.—The conferences between the officers of the East St. Louis & Suburban Railway, East St. Louis, Ill.. and the trainmen of the company over the working conditions of a new contract to take the place of the one that expired on May 1 were still being held on May 10.

Employees of Suburban Line Strike.—The employees of the Cincinnati, Georgetown & Portsmouth Railroad, Cincinnati, Ohio, who are members of the Amalgamated Association went on strike on April 28 to enforce recognition of the union and the reinstatement of their president, whom they contend was discharged because of his activity in behalf of the union.

Dynamiter Denied New Trial.—William Pollard, leader in the strike of the employees of the Georgia Railway & Power Company, who was convicted in the Superior Court on a charge of subornation of perjury, has been refused a new trial. He was charged with having aided in manufacturing an alibi for a striker arraigned on a charge of dynamiting during the walkout attempt in Atlanta.

New Wage Contract Submitted at Providence.—The local division of the Amalgamated Association has presented to the officers of the Rhode Island Company, Providence, R. I., a new working agreement calling for an increase in wages, the new contract to replace the present one, which expires on May 31. The company has a week in which to consider the matter and forward its reply.

Seventh Annual Prize Contest of Indiana Company.—The Union Traction Company of Indiana, Anderson, Ind., has announced the seventh annual prize essay contest for its employees. The subject for discussion will be "How Does the Obedient and Orderly Man Promote Safety First?" Prizes of $15, $10 and $5 in gold are offered by the company for the first, second and third best replies. The essays must be turned in before June 1.

Car-Full Jurisdiction Transferred.—The Assembly of New York has passed the bill of Senator Murphy of Brooklyn transferring from the local health authorities of New York and Buffalo to the Public Service Commission the power to regulate overcrowding on street cars. The bill, originally passed by the Senate, applying only to New York, was amended in the House so as to apply to Buffalo also, and now goes back to the Senate for concurrence in the amendment.

Committee Kills Corporation Tax in Pennsylvania.—The ways and means committee of the Pennsylvania House voted on May 8 to negative the Wallace bill proposing to make the property of public service corporations subject for local taxation. Adverse action by the committee virtually means that the measure is dead, since 104 votes would be required to place it upon the calendar. Representatives of the public service companies contend that since they pay a State tax they should be exempted from local taxation.

Strike Threatened at McAlester.—Employees of the Pittsburg County Electric Railway, McAlester, Okla., have presented demands for an increase in wages of 4 cents an hour for all motormen and conductors, with threats of a strike if the demands are not met. The company, through W. H. Vorce, general manager, offered an increase of 2 cents an hour for trainmen on two-men cars and 4 cents an hour for trainmen on one-man cars. The men declined to accept the compromise proposal and declared they would strike.

New Members Appointed to Indiana Commission.—On May 1 Governor James P. Goodrich appointed Ernest I. Lewis, John W. McCardle and William J. Wood as members of the Public Service Commission of Indiana to succeed Thomas Duncan and James L. Clark, whose terms had expired, and Edwin M. Lee, who had been removed by the Governor early in January. The new commission has organized by electing Mr. Lewis as chairman, and Carl H. Mote secretary. The hold-over members of the commission are Edwin Corr and Charles A. Edwards.

Philadelphia Hearings on May 18.—The proponents and opponents of the rapid transit program planned for Philadelphia are aligning their forces. The hearings are to begin on May 18. The proponents will then state their case. The objectors will be heard on May 25. The situation has been discussed at length at recent conferences between representatives of the city and officials of the Philadelphia Rapid Transit Company. Mayor Smith has announced that it has been decided to thresh out the whole matter before the joint committees of Councils on street railways and finance.

Toledo Problem Goes Back to Mr. Doherty.—After conferring with Attorneys Thurston and Emery of the Toledo Street Railway Commission, for two days on the wording of important clauses in the proposed community plan for settling the street railway matter at Toledo, Ohio, Judge D. C. Bailey, representing Henry L. Doherty, chairman of the board of the Toledo Railway & Light Company, decided he had not the power to act in the matters brought up and they will once more be referred to Mr. Doherty himself. It is expected that Mr. Doherty will visit Toledo again within a short time.

Seattle Municipal Railway Piles Up $105,120 Deficit.—According to figures filed by W. W. Clark and F. P. Mitten of the State Bureau of Inspection of Washington, the municipal street railway at Seattle shows a loss of $98,382 in operation for two years and seven months, from June 1, 1914, to Dec. 21, 1916. These figures are identical with the annual report of A. L. Valentine, superintendent of public utilities of that city. The first three months of 1917 added $6,738 to the loss, bringing the total to April 1 of this year to $105,120. The property as now operated comprises 13.2 miles of line.

Further Conferences at Tacoma.—A. L. Kempster, manager of the Puget Sound Traction, Light & Power Company, at a further conference between the City Councilmen of Seattle, Wash., and officials of the company, announced that the company stood willing to construct the Avalon Way cut-off as a more direct route for the Fauntleroy Avenue car line as soon as other questions now at issue between the city and company are settled. Mr. Kempster stated that industrial development in that district had reached a point to justify continuation of the present service to the heart of the district. The company is willing to grant the city common-user rights.

Progress on Oakland Indeterminate Franchise.—The committees which have been appointed by the Mayors of Oakland and Berkeley, Cal., to consider and pass upon the indeterminate franchise question, have organized and are working on a preliminary draft of the ordinance. The city of Alameda has organized under its new charter and the appointment of the committee is expected in the near future. The resettlement franchise bill which was unanimously passed by the State Legislature is now before the Governor for his approval. The settlements proposed to be made are with the San Francisco-Oakland Terminal Railways.

Increase in Wages in Portland.—An increase in wages of 3 cents an hour, amounting to more than $90,000 a year, has been granted by the Portland Railway, Light & Power Company, Portland, Ore., to its 1200 trainmen. The increase will go into effect on a graduated basis, the first increase of 2 cents an hour being effective on May 1 and the second increase of 1 cent an hour being in effect on Aug. 1, 1917. The increase will make the sliding scale of wages 28 to 34 cents an hour. In the past it has been 25 to 31 cents an hour. The new scale was arranged in agreement with the Brotherhood of Electric Railway Employees of the company.

Wires Ordered Underground in Frankfort.—An ordinance has been passed by the City Council of Frankfort, Ky., requiring that the electric distribution systems along portions of Main and St. Clair Streets be buried and, in addition, provides that along these same streets the Kentucky Traction & Terminal Company shall replace its wooden poles with ornamental steel poles. It is provided that the improvements shall be completed by April 1, 1918. The telephone and lighting companies will oppose the fulfillment of this program, in view of the fact that carrying out the plan would involve trenching a mile through solid limestone rock at very heavy expense.

Changes on the Key System.—Effective as of May 1, the efficiency department of the San Francisco-Oakland Terminal Railways, Oakland, Cal., was abolished as such. Hereafter the coasting recorder statistics will be kept by the auditor. Operating matters in connection with coasting instruction, records and the like, will be handled, as heretofore, by the transportation department under the jurisdiction of J. P. Potter, superintendent of transportation. U. S. Sliter, former superintendent of the efficiency department, and H. T. Brobeck, chief clerk to G. H. Harris, general superintendent, have been appointed assistant superintendents of transportation.

Electrification Plans Progressing Slowly.—The annual report of the Pennsylvania Railroad for the year ended Dec. 31, 1916, contains the following reference to the proposed Allegheny electrification: "No work was undertaken during the year on the proposed electrification of your main line across the Allegheny Mountains between Altoona and Conemaugh, beyond designing and constructing the type of electric locomotives required, continuing the detailed surveys and obtaining the experience of other lines in the use of electric traction for heavy freight and passenger trains. Scarcity of labor and the high cost of construction materials also made it desirable not to urge this improvement."

Sunday Prays for Interborough Men.—May 2 was Interborough night at the Billy Sunday tabernacle. Several thousand employees of the elevated and subway lines and the families of the employees attended the service in a body. Many of the executive officers of the company and the subway band were in the delegation. Among the 1452 "trail hitters" who went forward were H. H. Vreeland, former president of the Metropolitan Street Railway, now in charge of the Interborough welfare work, and A. L. Merritt, superintendent of the Subway. Sunday said that he knew Theodore P. Shonts, president of the Interborough, when Mr. Shonts was railroading in Iowa years ago. In concluding his prayer Sunday said: "I pray for these men and women from the Interborough. Bless the boys of the band who have come out to-night in their white uniforms looking like big snowflakes."

Women Conductors to Be Tried.—Unable to secure sufficient men to operate its cars, the Corning & Painted Post Street Railway, Corning, N. Y., intends to employ women as conductors on its Corning local lines. Last fall the men asked for a wage increase, with a minimum of 26 cents an hour. The company agreed to grant a wage increase based on seniority with a maximum wage of 26 cents an hour. The platform men agreed to accept this scale temporarily. Several weeks ago the company placed in operation a number of one-man cars on its Corning local lines, but the city authorities refused to allow the company to operate these cars. After a series of conferences between J. R. Empey, general superintendent of the company, and the city officials, the company announced it was not financially able further to increase the wages of the platform employees and signified its intention to try women conductors. Four women will be employed to serve on runs during off hours to determine how the plan works out.

Wage Increase at Colorado Springs.—The Colorado Springs (Col.) Interurban Railway increased the wages of its trainmen on May 1. The old rate was 25 cents an hour for the first two-year period, 27 cents for the third and fourth years, 28 cents for the fifth and 30 cents thereafter. Under the new rate the men will receive 25 cents an hour for the first year, 26 cents for the second year, 28 cents the third year, 30 cents the fourth year and 32 cents thereafter. An unusual circumstance in connection with this wage increase is the fact that the 136 trainmen now employed by the company are all maximum rate men, so that the wage rate for the entire force of trainmen will be 32 cents an hour. On June 1 the company will add to its force about twenty men who were laid off last fall after the tourist season closed. None of these men will be under two-year men. The earnings of the company did not justify the increase, but the company granted the raise voluntarily, because of the greatly increased cost of living.

Programs of Association Meetings

Iowa Electric Railway Association

At the meeting of the Iowa Electric Railway Association, at Des Moines, Ia., on May 24 and 25, the following program of papers will be presented:

"How Should the Electric Railway Manager Anticipate the Effects of the War?" by C. E. Fahrney, general manager of the Ottumwa Railway & Light Company.

"Is the A. E. R. A. Question Box Fulfilling Its Purpose?" by Scott H. Bluett, of the American Car & Foundry Company.

"Application of Automatic Substations to Interurban Operation," by W. A. Clough, of the General Electric Company, with discussion by F. C. Chambers, of the Des Moines City Railway.

"Safety Devices for One-Man Operation," by C. H. Beck, of the Westinghouse Traction Brake Company.

American Institute of Electrical Engineers

The annual convention of the American Institute of Electrical Engineers will be held at the Homestead Hotel, Hot Springs, Va., June 26 to 29. The convention will open on the afternoon of June 26 with President H. W. Buck's address, followed by the reports of the various technical committees. The two sessions on June 27 will be under the auspices of the transmission and distribution committee. The morning session of June 28 has been designated as the mining session. The fifth and last technical session will be held on June 29. The general subject of this session will be inductive interference between railway and telephone lines. The tentative list of convention papers for the first four sessions has been confirmed. The paper for the fifth session will be "Economical Combination of Water Power and Steam Plant and a Simple Method of Solution," by H. S. Putnam.

The annual business meeting of the institute will be held in the auditorium of the Engineering Societies Building on May 18. The board of directors will present its report for the fiscal year ended April 30, 1917. The seventh Edison medal, which was awarded to Nicola Tesla on Dec. 13, 1916, "for meritorius achievements in his early original work in polyphase and high-frequency electric currents," will be presented to Mr. Tesla at the annual meeting.

Financial and Corporate

Annual Reports

Public Service Corporation of New Jersey

The income statement of the Public Service Corporation of New Jersey, Newark, N. J., for the year ended Dec. 31, 1916, follows:

Operating revenue of subsidiary companies..........		$42,548,775
Operating expenses, including amortization charges and taxes		25,863,854
Operating income		$16,684,921
Non-operating income		516,529
Gross income		$17,201,450
Income deductions of subsidiary companies (bond interest, rentals and miscellaneous interest charges)		11,963,114
Net income of subsidiary companies................		$5,238,336
Public Service Corporation income from securities pledged (exclusive of dividends on stocks of operating companies) and from miscellaneous sources.............	$1,965,421	
Less expenses and taxes.................	162,885	1,802,536
		$7,040,872
Public Service Corporation income deductions:		
Interest charges	$3,678,876	
Amortization of debt discount and expense	174,088	
Sinking fund for Public Service general mortgage 5 per cent bonds............	209,500	
Other contractual deductions from income	36,540	4,099,005
Net income of Public Service Corporation and subsidiary companies		$2,941,867
Appropriation accounts of subsidiary companies:		
Amortization of new business expenditures prior to Jan. 1, 1911............	$40,330	
Adjustments of surplus account (credit).	118,984	78,654
		$3,020,521
Appropriation accounts of Public Service Corporation (exclusive of dividends)........................		72,828
Net increase in surplus before payment of dividends		$2,947,693

Dividends at the rate of 7 per cent per annum for the first quarter of the year, and at the rate of 8 per cent per annum for the last three-quarters of the year, aggregating $1,937,500, were paid upon the capital stock of the corporation, amounting to $25,000,000 at par.

The corporation shared in the general prosperity prevalent throughout the country. The total operating revenue of subsidiary companies amounted to $42,548,775, an increase of $5,077,546, or 13.6 per cent. The operating revenues for the three major subsidiaries and their affiliated companies for 1916, with the amount of increase and the percentage of increase over the previous year, are as follows:

	Operating Revenue	Amount of Increase Over Previous Year	Percentage of Increase
Public Service Railway.....	$18,175,764	$1,606,321	9.7
Public Service Electric Co...	12,814,597	2,388,745	22.9
Public Service Gas Company	11,558,413	1,082,479	10.3

The foregoing figures of increase, it is said, are highly satisfactory but are abnormal. All three of the companies shared in the prosperity, but the increase in the electric company's business is described as being little less than phenomenal.

The annual report states that during the last two years jitney operation undoubtedly diverted a very large revenue from the railway. That this industry can ever seriously impair the activities and future development of the railway, however, is not believed by those who have been closely watching the current of events during the last year. The revenues of the company were also seriously affected during the summer by the prevalence of the infantile paralysis epidemic, which closed many pleasure resorts and completely paralyzed juvenile riding. The operating people feel confident that the company lost a revenue of at least $250,000 from this cause.

The revenue from transportation increased from 30.540 cents per car-mile to 31.412 cents per car-mile, or 0.872 cents per car-mile. Operating revenue deductions increased from 19.603 cents per car-mile to 20.354 cents per car-mile. The ratio of operating revenue deductions to operating revenue was 63.7 per cent. Car mileage increased 6.0 per cent. Other statistics follow:

	1916	1915
Revenue passengers	342,205,993	313,923,363
Transfers and passes....................	109,492,019	100,498,677
Total passengers	451,698,012	414,422,040
Percentage of passengers using transfers.	21.8	21.5
Average fare per passenger (cents)......	3.82	3.82
Car mileage	54,964,708	51,873,660
Passenger receipts per car-mile (cents)...	31.37	30.49
Passenger receipts per car-hour (dollars)	2.92	2.84

The taxes for 1916 amounted to $2,713,059, an increase of $396,093, or more than 17 per cent. Fire insurance carried on Dec. 31, 1916, was $32,951,036, an increase of $2,731,357. The average rate in 1916 was 32.3 cents per $100 of insurance as compared to 34 cents in 1915. The net addition to fixed capital during 1916 was $7,236,259, of which $2,303,837 was for the railway department.

The total expenditures of the welfare department for insurance, sick benefits, pensions and expenses for 1916 were $88,368, an increase over the previous year of $12,263. The cost of accidents arising under the workmen's compensation act was $77,436, an increase of $17,949 over the year preceding. The total was divided as follows: Payments as required by act, $57,904; additional payments over and above those required by act, $7,047, and expenses of department, $12,484; total, $77,436.

Washington Water Power Company

The income, profit and loss statement of the Washington Water Power Company, Spokane, Wash., for the year ended Dec. 31, 1916, follows:

Gross operating revenue............................	$2,676,056
Interest on current balances.........................	8,968
Total revenues	$2,685,024
Operating expenses, including taxes...................	1,328,669
Net revenues	$1,356,355
Interest on bonds...................................	328,869
Interest on notes and loans...........................	99,384
Premium on $117,000 bonds bought for sinking fund...	259
Annual credit to amortization fund for discount on first refunding mortgage bonds............................	9,808
Interest on consumers' deposits, etc.................	1,035
Written off for replacement reserve..................	325,000
Uncollectible accounts, etc.........................	5,037
Total	$769,392
Net income	$586,963
Surplus from 1915..................................	986,945
	$1,573,908
Dividends	658,325
	$915,583
Credit adjustments prior to 1916....................	7,212
Surplus Dec. 31, 1916..............................	$922,795

No separate figures are given in this company's report for light and power and for railway earnings. It is stated, however, that jitney competition continued with little change from that in 1915. In that year the railway traffic fell off and the receipts decreased 13 per cent on account of jitney competition and the increasing number of private automobiles. In 1916 the total of passengers carried on the city lines declined still farther by 112,903 to 15,601,850, the smallest traffic total since 1907. During the last year, however, the car-miles run on all the lines rose from 3,612,993 to 3,666,944, and the car-hours showed an increase from 407,157 to 413,259.

The gross operating revenues of the company fell off $67,820, or 2.5 per cent, while the net revenues decreased $154,625, or 10.2 per cent. The total output of the light and power system for 1916 was 162,825,400 kw.-hr., a decrease of 1.86 per cent. Lighting and power revenues in the country districts increased 10 per cent, but reductions in rates brought down the Spokane total, and the power business in the Coeur d'Alene mining district showed a decrease of 8.4 per cent.

During 1916 the company expended $27,212 for capital purposes on the railway system and $293,670 on the lighting and power system. The book values of the two classes of property on Dec. 31, 1916, were as follows: Electric light and power, $21,102,735; street railway (city and interurban), $4,793,912.

Underground Electric Railways of London, Ltd.

The total income of the Underground Electric Railways of London, Ltd., London, England, for the calendar year 1916 totaled £653,361, as compared to £680,741 for 1915, a decrease of £27,380, or 4.02 per cent. The reduction in revenues from the subsidiary companies (for their report see ELECTRIC RAILWAY JOURNAL of March 17) may be seen from the following summary:

	1916	1915
Revenue:		
London Electric Railway	£147,804	£143,242
District Railway	36,619	40,950
City & South London Railway	31,809	14,832
London General Omnibus Company	128,038	192,058
Metropolitan Railway	151	177
London & Suburban Traction Company	5,889	6,586
Associated Equipment Company	143,000	170,000
Sundries (including income-tax returnable)	160,051	112,896
Total	£653,361	£680,741
Appropriations:		
Directors', etc., fees and expenses	£6,981	£11,813
Loss on foreign exchange	20,289	.....
Interest on 4½ per cent bonds	106,508	95,252
Interest on 4½ per cent 3-year secured notes	31,500	31,500
Central London guarantee	13,466	26,931
Interest on 6 per cent income stock	76,380	76,380
Interest on 6 per cent income bonds (1916, 5 per cent; 1915, 6 per cent)	406,178	438,731
Change in balance forward	—£7,942	+£134

Besides the falling off in subsidiary revenues, there was, as above indicated, a large loss on foreign exchange and increased income tax. The income tax on the interest on the 4½ per cent bonds and the 6 per cent income bonds, together with the loss on foreign exchange in respect to coupons cashed abroad, was £134,015, an increase of £56,805, or 73.57 per cent.

At the annual meeting of the company it was stated that the greatest obstacle to the increased prosperity of the subsidiaries at the present time is the increased cost of operation. Last September the railways were obliged to grant an additional bonus to their employees. Coal has increased in price to more than double the pre-war level, and it is still rising. Under a recent order of the government in regard to the use of advertising posters, the display of posters is prohibited in many cases, and it is likely that there will be a loss of a large part of the £100,000 of revenue from the company's advertising in stations, cars, elevators and omnibuses. These factors, it was said, will probably compel the companies to consider a fare readjustment.

Toronto Railway

The comparative income statement of the Toronto (Ont.) Railway for the years ended Dec. 31, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Gross earnings	$5,973,161	100.0	$5,694,136	100.0
Operating expenses	3,350,658	56.1	3,250,612	57.1
Net earnings	$2,622,503	43.9	$2,443,524	42.9
Interest on bonds	$156,122	2.6	$167,357	2.9
Percentage on earnings	909,881	15.2	868,254	15.2
Pavements, taxes	215,707	3.6	215,424	3.8
Total	$1,281,710	21.4	$1,251,035	21.9
Surplus earnings	$1,340,793	22.5	$1,192,489	21.0

Although the gross earnings of the company for the calendar year 1916 did not show a return to the high figures of $6,127,096 in 1914 and $6,099,018 in 1913, the net earnings showed a gain over those of $2,597,550 in 1914, which was the highest record of net earnings since 1906, with the exception of $2,925,710 in 1913. As compared to the preceding fiscal year, the increase in 1916 in passenger earnings amounted to $270,208, or 4.7 per cent, while the increase in gross earnings was $279,025, or 4.9 per cent. The operating expenses rose only $100,046, or 3.7 per cent, so that the ratio of expenses to passenger earnings was 57 per cent in 1916, as compared to 57.9 per cent in 1915.

The net earnings for the last fiscal year showed a gain of $178,979, or 7.3 per cent over those in 1915. The decreased interest charges on bonds were more than offset by the higher percentage payment on earnings, but the surplus earnings after payment of all expenses, interest, taxes, etc., showed an increase of $148,304, or 12.4 per cent over those for the preceding year. After adding the surplus at the beginning of the year and deducting the regular dividend of 8 per cent, the surplus carried forward at the end of the year totaled $5,408,874, as compared to $5,026,907 the year before.

The passengers carried in 1916 totaled 149,529,754, an increase of 7,468,496 over those in 1915, while the transfers numbered 61,342,673, a decrease of 1,055,875 from the 1915 figure. The number of passengers carried was greater than in any preceding year since 1906 with the exception of 1913 and 1914, when the totals were 151,236,925 and 152,966,153 respectively.

Almost at the close of the year the company suffered a loss by fire. On Dec. 28 a fire in the carhouse at St. Lawrence and King Streets completely destroyed the building and contents, including 168 cars.

Purchase Rumors Denied

The passage of the charter amendments of the Shore Line Electric Railway, referred to in the ELECTRIC RAILWAY JOURNAL of May 5, page 844, and the statements made in behalf of the New Haven Railroad in connection with the application of that company to issue preferred stock, have resulted in various rumors in regard to the final lodgment of the electric railway holdings of the New Haven under the agreement reached by that company some time ago with the Government for the disposition of its so-called outside holdings, among which are the Connecticut Company and the Rhode Island Company, operating the electric railways in Connecticut and Rhode Island respectively controlled by the New Haven. Coupled perhaps most frequently with these rumors has been the name of Morton F. Plant, New London, Conn., millionaire railroad operator and director of the Shore Line Electric Railway. Efforts made by the Providence *Tribune* to reach Mr. Plant regarding these rumors as concerned the Rhode Island Company have resulted in their denial by him. The *Tribune* quotes Mr. Plant as follows:

"I do not know anything about the report. If there was any foundation for the story I suppose I would know something about it."

Mr. Plant was then informed that it was reported that he was to purchase the Rhode Island Company as part of a general plan comprehending the taking over of all the electric railways between New York and Boston. To that he is reported to have replied:

"There is absolutely no foundation for this story."

American Cities Company, New York, N. Y.—The gross earnings from all sources of the combined constituent companies of the American Cities Company amounted in 1916 to $15,464,361, as compared to $14,145,442 in 1915, an increase for the last year of 9.3 per cent. This compares with a decrease of 4.3 per cent in 1915 and is the largest increase since 1907. Operating expenses and taxes rose from $9,121,734 in 1915 to $9,965,083 in 1916, so that the net earnings at $5,499,278 represented a gain of 9.4 per cent. After deducting $3,810,259 for interest, bond discount, amortization and miscellaneous, the amount applicable to stock dividends was $1,689,019 in 1916 as compared to $1,366,510 in 1915, an increase of $322,509.

Birmingham (Ala.) Tidewater Railway.—First mortgage 5 per cent gold bonds of the Birmingham Tidewater Railway, the successor to the Birmingham, Ensley & Bessemer Railway, are being offered by Howard R. Taylor & Company, Baltimore, Md. The bonds are guaranteed as to principal and interest by the Birmingham Railway, Light & Power Company, which owns the stock of the Birmingham Tidewater Railway. The bonds are dated Jan. 1, 1916, and are due on Jan. 1, 1946. The amount authorized is $4,000,000 and the amount issued $1,500,000.

Boston & Worcester Street Railway, Boston, Mass.—The Boston & Worcester Street Railway has been authorized by the Massachusetts Public Service Commission to issue $270,000 of additional preferred stock and $40,000 of additional first mortgage bonds, which will make $667,000 of stock and $2,440,000 of bonds outstanding respectively.

Boston (Mass.) Elevated Railway.—The Senate committee on ways and means reported favorably on May 7 the report of the committee on metropolitan affairs recommending legislation to benefit the Boston Elevated Railway. The $15,000 appropriation for a further investigation of the affairs of the Boston Elevated Railway was eliminated by the committee.

Central Park, North & East River Railroads, New York, N. Y.—Newton M. Hudson, who is auditor of the Second Avenue Railroad, has been appointed receiver of the Central Park, North & East River Railroad. The property of this company was sold under foreclosure in 1912 and is now owned by the Belt Line Railway Corporation, a subsidiary of the Third Avenue Railway. The organization of the Central Park, North & East River Railroad is maintained to wind up the affairs of the company.

Hagerstown & Frederick Railway, Frederick, Md.—A special meeting of the stockholders of the Hagerstown & Frederick Railway was called for May 7 to consider a plan for the reduction and readjustment of the company's capitalization. The plan provides for the retirement of the present outstanding $1,225,000 of 5 per cent convertible adjustment bonds, the $635,000 of 7 per cent cumulative preferred stock and the $2,000,000 of common stock and the issuance in lieu thereof of $600,000 of ten-year 6 per cent notes, $842,500 of 6 per cent cumulative preferred stock and $1,483,500 of new common stock. The plan provides for the conversion of a portion of the old preferred stock and the reduction of the common stockholdings to one-third the present amount.

Hudson Companies, New York, N. Y.—A plan for certain financial readjustments affecting the Hudson Companies has been advanced by Walter G. Oakman, president. The concern is a holding company. It owns a majority of the stock of the Hudson & Manhattan Railroad and also controls the Greeley Square Realty Company, the property of which is leased to Gimbel Brothers as a site for their store, and other buildings at Sixth Avenue and Thirty-third Street. It is pointed out to stockholders that the Hudson Companies owes $1,950,000 which will mature during 1918. It is suggested that the Hudson Companies transfer its Greeley Company bonds and stocks and its interest in the Greeley Company first mortgage and any of that company's first refunding bonds to the Greeley-Hudson Securities Company, newly organized in an exchange plan set forth in detail by Mr. Oakman. After the consummation of the plan the Hudson Companies will still own its Hudson & Manhattan Railroad stocks and any of the $2,000,000 of stock of the new company not sold with the notes. In regard to the effect of the plan Mr. Oakman said in part: "Your directors are assured that, if this plan becomes effective, the common stock of the Hudson Companies will be surrendered and canceled, whereupon it will be in order to reduce the preferred stock and distribute to the holders thereof such remainder of the capital stock of the new company, the Hudson Companies retaining the said railroad company holdings. To have this 'control' of the Hudson & Manhattan Railroad thus set free from all lien or debt and held together for future realization is obviously of great advantage."

Kanawha Traction & Electric Company, Parkersburg, W. Va.—The Fidelity Trust Company, Baltimore, Md., has issued a circular describing the first and refunding mortgage 5 per cent gold bonds, Series A, of the Kanawha Traction & Electric Company. These bonds are dated Aug. 1, 1916, and are due on Aug. 1, 1936. The proceeds of the bonds now sold will be used to retire $150,000 of first mortgage 6 per cent bonds of the Marietta Electric Company, due April 1, 1917; $1,100,000 of two-year 5 per cent notes due June 15, 1917, and for other corporate purposes. Reference to the filing of the mortgage securing the bonds was made in the ELECTRIC RAILWAY JOURNAL of Aug. 26, 1916, page 375.

Long Island Railroad, New York, N. Y.—According to its annual report for the calendar year 1916, the Long Island Railroad during the last year carried 45,802,722 passengers and 5,134,838 tons of freight, or 3,173,397 more passengers rode and 691,505 more tons of freight were hauled than in the preceding year. The heavy traffic of the year was reflected in the gross earnings from railroad operation, which amounted to $14,971,838, an increase of 10 per cent. Railway operating expenses also increased heavily, reaching a total of $9,927,207, or $800,285 greater than in 1915. The company earned as a result of the year's operation, a net income of $241,735. This represented a return of 2 per cent on the outstanding capital stock, and compares with a deficit of $161,083 incurred in 1915. Contracts made during the year for new equipment to be delivered in 1917 included forty-five steel passenger cars for electric service. In addition to these, out of equipment ordered for completion in 1916 there remained undelivered at the end of the year twenty-five steel passenger cars for electric service.

Orleans-Kenner Electric Railway, New Orleans, La.—Harry K. Johnson, promoter of the Orleans-Kenner Electric Railway, has issued the following statement in regard to the disposition of the property of the company: "On the strength of a statement by Francis T. Homer, of the firm of Bertron, Griscom & Company, New York, that he would allow the property owners of Jefferson to purchase the controlling interest in the Orleans-Kenner Electric Railway, which he had secured from Johnson & Company, Inc., builders and owners of the Orleans-Kenner Electric Railway, a syndicate was formed by Allen H. Johness, president of the General Realty Company, for this purpose. I understand that the stock in the new company organized by Mr. Johness has been considerably over-subscribed. Papers in connection with the deal have been signed and the new company is prepared to pay over the money. The amount involved is approximately $500,000, exclusive of money for development, which, I understand, has been taken care of by the subscribers."

New York (N. Y.) Railways.—The Public Service Commission for the First District of New York has granted the application of the New York Railways for authority to purchase 6842 of the 9000 shares of the Bleecker Street & Fulton Ferry Railroad on which it had an option. The company will pay $28.50 per share, and will give the same amount for the remaining shares if deposited within a reasonable time.

Philadelphia Company, Pittsburgh, Pa.—Ladenburg, Thalmann & Company, Blair & Company and Hayden, Stone & Company have announced to the holders of the first mortgage and collateral trust 5 per cent gold bonds of the Philadelphia Company, due March 1, 1949, and of the consolidated mortgage and collateral trust 5 per cent gold bonds due Nov. 1, 1951, that they have extended until May 31 the time within which deposits of these bonds may be made. More than 65 per cent of the first mortgage bonds and more than 70 per cent of the consolidated mortgage bonds had been deposited up to May 1. The deposit of these securities has been asked in connection with the sinking fund and redemption plan referred to briefly in the ELECTRIC RAILWAY JOURNAL of March 10, page 456.

Poughkeepsie City & Wappingers Falls Electric Railway, Poughkeepsie, N. Y.—The Poughkeepsie City & Wappingers Falls Electric Railway has increased its capital stock from $750,000 to $1,000,000.

Richmond Light & Railroad Company, Richmond, S. I., N. Y.—The application of the Richmond Light & Railroad Company and the Staten Island Midland Railway for permission to consolidate was refused on May 10 by the Public Service Commission for the First District of New York. The opinion of the commission was written by Commissioner Hervey. He said that no evidence had been submitted to show that the bonds to be refunded had been issued for capital purposes. He also said that it was incumbent upon the company to prove that the obligations proposed to be discharged or refunded were not only actual obligations but were issued for capital purposes.

Scranton (Pa.) Railway.—Newburger, Henderson & Loeb and Bioren & Company, Philadelphia, Pa., are offering at 94 and interest $2,500,000 of first and refunding 5 per cent thirty-year gold bonds of the Scranton Railway, dated Feb. 1, 1917. The bonds are guaranteed as to principal and interest by indorsement by the American Railways. They are redeemable after Feb. 1, 1922, at 102½ and interest.

Second Avenue Railroad, New York, N. Y.—Andrew E. Kalbach has been named as receiver of the Second Avenue Railroad by Justice Giegerich, of the Supreme Court, in place of John Beaver, deceased.

Tidewater Power Company, Wilmington, N. C.—Hugh McRae, president of the Tidewater Power Company, has addressed a letter to the stockholders of the company, in which he advises them of the sale of his interest in the company to Brooks & Company, Scranton, Pa., noted in the ELECTRIC RAILWAY JOURNAL of April 21, page 754. The company has $595,000 of 6 per cent preferred stock and $600,000 of common stock outstanding. On the common dividends at the rate of 7 per cent are being paid. Mr. McRae says that holders of common stock may dispose of their interest to Brooks & Company at $105 a share, payable in negotiable notes, one for one-half the purchase price payable on or before Nov. 16, 1919, and one for the balance of the purchase price payable on or before May 16, 1920, with interest on deferred payments at 6 per cent per annum. Mr. McRae says that in addition Brooks & Company further agree to transfer certain real estate now owned by the Tidewater Power Company to the present stockholders of the company as an additional payment on the stock.

Dividends Declared

Boston (Mass.) Elevated Railway, quarterly, 50 cents.

Cumberland County Power & Light Company, Portland, Maine, quarterly, 1½ per cent, preferred.

Lincoln (Neb.) Traction Company, quarterly, 1½ per cent, preferred.

Pacific Gas & Electric Company, San Francisco, Cal., quarterly, 1½ per cent, original preferred; quarterly, 1½ per cent, first preferred.

Electric Railway Monthly Earnings

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar.,	'17	$163,197	$123,232	$39,965	$36,036	$3,929
1 " "	'16	146,546	*102,400	44,146	36,511	7,635
3 " "	'17	469,516	*352,564	116,952	107,447	9,505
3 " "	'16	439,640	*301,277	138,363	109,698	28,665

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

1m., Mar.,	'17	$87,360	*$73,767	$13,593	$27,550	†‡$13,900
1 " "	'16	72,293	*66,603	5,690	22,304	†‡16,380
3 " "	'17	245,482	*214,329	31,153	82,650	†‡51,208
3 " "	'16	212,396	*194,471	17,925	66,935	†‡48,407

CONNECTICUT COMPANY, NEW HAVEN, CONN.

1m., Mar.,	'17	$806,909	*$613,297	$193,612	$96,782	‡$119,176
1 " "	'16	751,504	*545,299	206,205	97,847	‡130,775
3 " "	'17	2,314,102	*1,847,562	466,540	287,846	‡215,983
3 " "	'16	2,134,382	*1,503,516	630,866	293,902	‡404,765

KANSAS CITY (MO.) RAILWAYS

1m., Mar.,	'17	$637,053	*$412,659	$224,394	$129,760	**$40,334
1 " "	'16	585,754	*367,216	218,538	115,333	**51,659
9 " "	'17	5,554,695	*3,688,268	1,866,427	1,171,100	**351,709
9 " "	'16	††				

NEW YORK & STAMFORD RAILWAY,
PORT CHESTER, N. Y.

1m., Mar.,	'17	$27,317	*$35,078	†$7,761	$7,987	†‡$15,704
1 " "	'16	24,955	*22,691	2,264	7,979	†‡5,678
3 " "	'17	77,310	*85,388	†8,078	23,961	†‡31,921
3 " "	'16	71,420	*68,200	3,220	23,960	†‡20,624

NEW YORK, WESTCHESTER & BOSTON RAILWAY,
NEW YORK, N. Y.

1m., Mar.,	'17	$45,164	*$47,371	†$2,207	§$6,179	†‡$7,635
1 " "	'16	39,834	*46,536	†6,702	§5,997	†‡10,986
3 " "	'17	130,528	*141,319	†10,791	§22,863	†‡29,638
3 " "	'16	118,018	*171,121	†53,103	§22,170	†‡70,121

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

1m., Mar.,	'17	$478,057	*$389,422	$88,635	$119,285	†‡$30,040
1 " "	'16	451,308	*355,741	95,567	118,373	†‡21,828
3 " "	'17	1,368,320	*1,127,865	240,455	357,508	†‡87,235
3 " "	'16	1,290,381	*1,042,231	248,150	320,140	†‡42,611

WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.

1m., Mar.,	'17	$18,849	*$23,799	†$4,950	$2,018	†‡$6,939
1 " "	'16	17,997	*18,657	†660	1,748	†‡2,383
3 " "	'17	50,411	*64,855	†14,444	6,055	†‡20,417
3 " "	'16	52,618	*61,216	†8,598	5,196	†‡13,717

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*Includes taxes. †Deficit. ‡Includes non-operating income. §Excludes interest on bonds, charged income and paid by the New York, New Haven & Hartford Railroad under guarantee; also interest on notes held by the New York, New Haven & Hartford Railroad not credited to income of that company. **Includes addition of miscellaneous income, and deduction of Kansas City surplus reinvested in plant. ††During the fiscal year to Feb. 14, 1916, the property was operated by the receivers under the old securities, and the figures for this period, being without value in a comparative statement, are not shown here.

Traffic and Transportation

Atlantic City Ordinance Bars Jitneys

Commission of That City Decides Against Their Operation on Principal Street and Fixes License Fee

At a hearing April 26 on the controversy between the Atlantic City & Shore Railroad, Atlantic City, N. J., and the local Association of Jitney Owners before the City Commissioners an ordinance was passed which prevents jitneys from operating on Atlantic Avenue, the principal business street. The commissioners passed also a companion bill which will compel jitneys to pay an annual license fee of $50 instead of 5 per cent of their gross receipts. Officers of the jitney owners' association declared that the two measures, which became effective on May 7, sound the death-knell of independent transportation in Atlantic City.

Clarence L. Cole, receiver and counsel for the trolley company, urged the elimination of the jitney from Atlantic Avenue in order that the company could rehabilitate itself. He said that the company as well as its predecessors had realized no profit, but besides contributing to the welfare of the city had kept pace with its growth and development. He said that three of the local lines had been operated at a loss which amounted to $50,000 the past year. Prior to the advent of jitney competition the company had 300 employees and paid $184,000 annually in salaries. This amount was decreased $20,000 last year through compulsory retrenchment. The company pays $34,000 a year in State and city taxes on a total investment of $500,000. Mr. Cole said further that the West Jersey & Seashore Railroad, which built the trolley line, paid $150,000 annually for ten years for maintenance besides building its roadbed at a cost of $300,000. These outlays, he maintained, placed the city under moral obligation to give the company exclusive transportation privileges for the same reason that the Public Utility Commission would refuse to franchise a competing line.

Attorney S. Cameron Hinkle, counsel for the jitney association, said that he believed the jitneys should be given due consideration in view of the great popularity of the cars. He urged that the public interest be considered and declared that elimination of the jitney would materially cripple the city's transportation facilities.

A delegation of the jitney men has since submitted to the commission 140 petitions bearing about 4700 names which asked for a referendum vote on the ordinance. The petitions were not accepted on account of an opinion issued by City Solicitor Wootton, which stated the ruling ordinance was passed pursuant to the provisions of a State-wide act not subject to referendum or recall. The jitney men intend to investigate the possible recourses left to them and take further action in the matter.

Chicago Surface Traffic Improved

Police Enforce New Ordinances—Street Cars Attain an Unprecedented Schedule Speed

The new traffic ordinances now in effect in Chicago which define car "loading zones" and prohibit the parking of vehicles on the car-line streets in the loop district during rush hours greatly facilitate the movement of cars and vehicles in general. The marked increase in the speed of cars has caused much comment on the part of pedestrians and passengers of vehicles. Street cars are enabled to run on a schedule speed never before attained in this district. The ordinances became effective on May 1 and were quoted in the ELECTRIC RAILWAY JOURNAL for May 5, page 847. President Leonard A. Busby of the Chicago Surface Lines made the following statement commenting on the results of the new ordinances:

"Conditions in the loop during the evening rush hours are better than they have been for years. The congestion is materially reduced. The cars are loaded more quickly and more safely. Instead of lines of cars standing idle or creeping into the loop as heretofore, the cars get into the loop promptly, are loaded quickly and proceed from the loop much quicker than usual. This means that the people get home more quickly and more comfortably. All of this is due to the prompt enforcement by the police of the new anti-parking and 'loading zone' ordinances.

"The conductors and motormen are more than pleased at the new conditions, which enable them to perform their duties much more satisfactorily to the public, and they take a keen interest in the enforcement of the ordinances. The improvement in conditions is so marked, and the benefit to the public so great, that I believe everyone will gladly continue to co-operate in this matter, and in time extend the reform still further."

Mr. Loree Suggests More Revenues

Believes Application for 6-Cent Fare Would Be Sympathetically Received by Commission

President L. F. Loree, speaking to stockholders of the Delaware & Hudson Company at the annual meeting on May 8, stated that the electric railway investments of his company seem to have passed through their worst period, but that the companies need additional compensation to cover the higher costs which they are being required to meet. He believed that a 6-cent fare application would be sympathetically received by the Public Service Commission for the Second District of New York.

Mr. Loree made four suggestions, some of which he hoped would be favorably received by the commission, whereby the electric lines may receive needed compensation for the higher costs which they have to meet. These suggestions are as follows:

1. Readjustment of present requirements for street paving. The cost to the United Traction Company on account of the rule that they must pave between the tracks and to a point 18 in. on either side has amounted to $200,000 a year. Mr. Loree pointed out that this requirement is a heritage from horse-car days, when the traction companies did wear out the pavement; but that under present conditions there is no wear and tear on the pavement by the street railways.
2. A charge for a transfer. A 2-cent charge for a transfer, Mr. Loree said, would help the companies substantially.
3. A 10-cent fare for patrons of the line between midnight and 6 a.m. Night service is expensive to maintain, and while doubling of the fare would not aggregate much in total, it would be helpful.
4. A 6-cent fare. Wages on the Delaware & Hudson electric lines have advanced 40 per cent and materials 60 per cent in the last five years, while rates have remained stationary.

Seven-Cent Fare Unit Granted

City Officials and Representatives of the Public at the Hearing Approve Fare Increase

A general fare increase to 7 cents instead of the present 5-cent unit has been allowed by the Public Service Commission of Massachusetts in the case of the Norwood, Canton & Sharon Street Railway, Canton, Mass. The company is also authorized to sell ten tickets for 65 cents and sixteen for $1. School tickets will be sold at the rate of ten tickets for 35 cents instead of 25 cents as formerly. The road is about 6.25 miles long, in two parts, which are separated by the Blue Hill Street Railway. During 1916 the operating revenue was $10,874, while the operating expenses were $13,432. During the first eleven years of operation and in 1916 the company failed to earn operating expenses, and no dividends have ever been paid. The hearing on this case was reviewed in the ELECTRIC RAILWAY JOURNAL for Feb. 17, page 322.

The commission found in its investigation that the company has been operating at a relatively low cost, and that no substantial saving can be made through increased economies in operation. The cost of power is relatively high, but the company is obliged to buy its power and claims that no more advantageous arrangement can be made. Poor track and equipment are factors producing the high cost of power per car-mile. The commission held that a total expenditure of at least $6,000 per year for the next three to five years should be made on the property. Later the annual maintenance charge would probably be about $3,000, besides about $3,000 to be allowed for depreciation. Joint service from Sharon Heights to Canton Junction over the Blue Hill Street Railway was suggested at the hearing as a means of increasing the company's net revenues, but the commission questioned its advisability. There is little prospect of lower labor and material costs or increased revenue through growth in population of the company's territory. The gross income statement for the last three years showed an annual decline. The company needs an increase of about $7,300 in annual gross operating revenue, and it is estimated that the new rate will yield about $3,300.

In the recent Blue Hill fare investigation the commission intimated that it was doubtful whether the establishment of an 8-cent fare in that case would not have constituted an unjust discrimination against the short-haul riders, and approved an increase in the number of fare zones instead. The board pointed out that a rearrangement of fare zones is also likely to result in unfairness to passengers who are obliged to travel just across zone lines and thus introduce complications which it is sought to avoid. On account of the separation of the Norwood, Canton & Sharon Street Railway into two unrelated parts, it was impracticable to rearrange the fare zones.

Safety Work Brings Results

The safety organization of the Puget Sound Traction, Light & Power Company, Seattle, Wash., according to *The Electrogram*, its publication, regards safety first as not merely a motto but a slogan to be constantly applied in practice. It is a co-operative organization enlisting all officials and employees of the company and was formed in Seattle in 1912, at that time the first street railway organiation of the kind in the country. It is directed by a central committee and is divided into division safety committees representing the departments, as railway, power plant, steam plant, shops, electric transmission, etc. Meetings are held regularly in the carhouses where officials and men meet to discuss the different problems of safety work. A lecturer, who works in the public schools, has been maintained for six years and the results have been very encouraging. Accidents to children have been reduced from thirteen a month in 1912 to four a month in 1916.

The aim of the company is to reduce to a minimum the number of accidents that can be prevented by safety devices, rules and caution. The accompanying table gives the number of automobile and wagon accidents which involved street cars or occurred on streets near cars, and also the number of collisions with pedestrians which resulted in injuries for the years from 1912 to 1916. The automobile accidents are still on the increase, but the company places the burden of responsibility for these accidents upon automobile drivers since the cars cannot leave the tracks to avoid collisions.

TABLE SHOWING ANNUAL NUMBER OF ACCIDENTS INVOLVING DIFFERENT CLASSES OF TRAFFIC

Year	Automobile	Wagon	Pedestrian
1912	475	509	149
1913	702	533	135
1914	864	333	116
1915	1,554	235	89
1916	1,699	276	79

Business Stimulated by Rehabilitation

The Wisconsin Railway, Light & Power Company, La Crosse, Wis., began in June, 1916, to improve its property and service in order to encourage travel on its cars. Seven new forty-passenger pay-as-you-enter cars were purchased. Fifteen cars were remodeled for pay-as-you-enter operation and so far as possible were made to conform with the standard of the new cars in features such as folding doors and steps, lifeguards instead of projecting fenders, etc.

In December, 1916, through routing of lines was inaugurated which made it possible to reduce the number of lines from five to four, and to improve the schedule speed. A franchise arrangement is now before the local City Council, which will permit the further rearrangement of two lines and the reduction of the total number of lines to three. These will serve the city more efficiently and will provide for future growth through simple line extensions. Since this through routing has been established the number of transfers issued has been reduced more than 27,000 per month, and it is anticipated that the ultimate reduction will be more than 50 per cent.

The work of double-tracking four blocks on Main Street and six blocks on the south side line which is now in progress will, when completed, eliminate delays which now result from two lines operating over the same track. This will also make possible a five-minute headway for a distance of twenty blocks instead of a ten-minute headway as at present. The line voltage throughout the system has been raised also from 500 to 600 volts to increase the schedule speed. These various changes in service and equipment have materially effected economies and stimulated heavier riding.

Bus Line Established.—The Public Service Commission for the Second District of New York has granted a certificate of public convenience and necessity to Albert F. Warner for an auto-bus route between Watertown and Adams. No local passengers may be carried within the city of Watertown.

Fare Hearing Postponed.—The hearing before the Public Service Commission of New Hampshire on the petition of the Bay State Street Railway, Boston, Mass., for permission to increase its fares in Nashua, N. H., and to change the city fare limit in Hudson has been set for May 28 at Concord.

Dismissal of Fare Case Refused.—The Board of Public Utility Commissioners for New Jersey has denied a motion to dismiss the case of the city of Hoboken for a 3-cent fare on the Public Service Railway. The case has been pending for a long time now. Another hearing on the matter will be held in Jersey City on May 16.

Skip Stop Talked of in Washington.—The Capital Traction Company, Washington, D. C., is contemplating the adoption of skip-stop service for some cars during rush hours. A survey of the line has been made by representatives of two citizens' associations and the company. It is proposed to eliminate approximately one-third of the present stops.

Merchants Appreciate Electric Express.—The business men of Reading, Pa., are taking advantage of the freight service on the Reading Transit & Light Company, which was inaugurated about a year ago. The fast express service has proved to be a great convenience to shippers, and the business in Lancaster and vicinity has consequently increased to a marked degree.

Service Changes Planned for Cleveland.—The committee representing nineteen city organizations, which was appointed to suggest methods for eliminating traffic congestion in Cleveland, Ohio, has approved a plan and submitted it to officials of the Columbus Railway, Light & Power Company. According to the plan several lines would be rerouted and other routes would be changed so that cars on High Street would run a shorter distance than formerly.

Bay State to Reject Intoxicated Patrons.—The Bay State Street Railway, Boston, Mass., has promised the City Council its co-operation and support in keeping intoxicated persons from entering the city on its cars. A resolution to this effect, passed by the Council, has been posted in the carhouses of the company in Haverhill, Lawrence and Lowell. This movement is in line with similar actions taken by the Illinois Traction Company, Peoria, Ill., and the Philadelphia & West Chester Traction Company, Upper Darby, Pa., as noted recently in the ELECTRIC RAILWAY JOURNAL

Auburn-Syracuse Fares to Be Raised.—The Auburn & Syracuse Electric Railroad, Syracuse, N. Y., has announced that beginning May 28 a rate of 2 cents a mile will be charged between Auburn and Syracuse. This will make the fare 52 cents instead of 45 cents and the round-trip fare will be increased from 85 cents to $1. It is intended to leave some of the fares between intermediate points unchanged while others are to be slightly reduced. The proposed increase is said to have resulted from the general increase in expenses and the increase in wages recently granted to the company's employees.

Through Freight Rates Established.—C. B. Stafford, manager of the traffic department of the Board of Trade of Louisville, Ky., has announced that through freight rates on the electric railways connecting with the Louisville-Indianapolis lines at Indianapolis will soon be published by those systems. This matter in various phases has been before the Interstate Commerce Commission on several occasions. Certain difficulties have been met and the tariff will be made out soon. The new tariff will give rates by way of the electric lines from Louisville to stations in southern Michigan and in Illinois, Indiana and Ohio, north of Indianapolis.

Commission Acts on Freight Advance.—The Public Service Commission for the Second District of New York has permitted the railroads to file tariffs covering the proposed 15 per cent increase in freight rates in the same simplified form as the Interstate Commerce Commission has provided in interstate rates. This is a modification of the commission's rules to avoid expense and delay in the preparation of the elaborate rate schedules. The commission will in all probability take no action until the interstate rates have been settled. It does not approve of the new rates at this time and they are, as usual, subject to complaint, investigation and correction if in conflict with the State laws.

Texas Dealers Prefer Electric Express.—Testimony received by the Interstate Commerce Commission, in the rehearing of the Shreveport rate case at Dallas, Tex., disclosed the fact that jobbers and wholesale dealers of Dallas and other Texas towns reached by electric lines are shipping their freight by interurban express because the interurban express rates are considerably less than the rates by steam and because the interurban lines deliver shipments much more promptly than the steam lines. It was shown that the steam lines are operating under Fonda Tariff 2-B, while the interurban lines are employing the Texas Railroad Commission tariffs, which are considerably lower than the tariffs of the Fonda schedule.

Advance in Interurban Fares Proposed.—The Hagerstown & Frederick Railway, Frederick, Md., has filed with the Public Service Commission of that State a new tariff asking for an increase in interurban fares. The reasons given for the proposed advance are increased wages, higher prices for metal products and new equipment, and that the increase in transportation business is not sufficient to meet the increased operating expenses. Patrons had suggested that the usual summer service be furnished, which the company had intended to reduce, even at a slight advance in fares. It was decided to increase the interurban rates, which are now less than 2 cents per mile. The city fare of 5 cents and the commuter's rate will remain unchanged.

I. R. T. Traffic Record Shows Increase.—Figures just compiled by the Interborough Rapid Transit Company, New York, N. Y., show that during the month of April the subway carried 37,814,292 passengers, an increase of 3,662,514 or 10.7 per cent over the number carried in the same period last year. The elevated system carried 29,771,642 persons as compared with 27,942,079 for April, 1916, an increase of 1,829,563 or 6.5 per cent. These increases bring the total gain in passengers carried on the dual system during the last ten months of the fiscal year to 69,244,983. The total number of passengers carried in that period was 634,740,670. The total fares collected during last month amounted for the subway to $1,888,586 and for the elevated $1,487,549.

Disagreement on Smoking Privilege.—In response to a request by A. L. Valentine, superintendent of public utilities of Seattle, Wash., Hugh M. Caldwell, corporation counsel of that city, has issued an opinion stating that so far as the city is concerned passengers may smoke on street cars. Mr. Valentine had been requested to prohibit smoking on cars of the Puget Sound Traction, Light & Power Company running to and from the industrial plants. In a suit brought about two years ago by John M. Day, a prominent attorney, Judge Everett Smith of the Superior Court issued an injunction which prohibited anyone from holding a lighted cigar, cigarette or pipe inside a car. Mr. Caldwell recognized that injunction but said it was not the city's duty to enforce it. Mr. Day cited ordinances to show that this is the duty of the superintendent of public utilities.

Better Service on Pacific Northwest.—The Seattle-Everett interurban service of the Pacific Northwest Traction Company, Seattle, Wash., has been increased according to a new schedule effective May 1. Six limited trains daily in each direction are now operated, instead of the two as formerly, and a special late-train service has been instituted. On Saturdays and Sundays the number of limited trains is increased to nine. During seven years of operation, the road has run 110,000 trains, carrying a total of 5,000,000 passengers, without a single serious accident involving passengers, and not a passenger has been injured. Records in the dispatcher's office show that more than 99½ per cent of all the trains have left their terminals on time, and less than 4 per cent have arrived late. K. K. Carrick is general traffic agent, and Donald C. Barnes is local manager of the company.

Night Express to Reduce Expenses.—In a recent address to employees of the Toledo Railways & Light Company, Toledo, Ohio, one of the H. L. Doherty properties, Mr. Doherty said that freight hauling at night by electric railways would be a great revenue producer and would also serve to eliminate excessive handling of merchandise. The managers of the Doherty electric railway properties have been requested to investigate the plan thoroughly with a view of adopting it if possible. The hauling of products from the farms to the railroad and from the city terminal to the city buyer is done by inefficient methods which are expensive to the farmer and the consumer. Hauling freight at night on street cars would also eliminate congestion on city streets. Moreover, it has been pointed out that the plan would enable a city to extend its territorial limits without following steam railroads.

Seattle to Use More One-Man Cars.—The Puget Sound Traction, Light & Power Company, Seattle, Wash., has been authorized by the Public Service Commission of that State to operate more one-man cars on its lines in Seattle, and also to rebuild its old-style single-truck cars to conform with what is known as the "Type 142." Cars of this type are now in use on the Bellevue-Summit line of this company. The commission hastened its decision in order that the company could save the additional expense referred to in a notice which stated that on May 1 the cars would advance in price from 20 to 25 per cent. Seventy-five cars of this type will be required for use in Seattle. They have been in service in Spokane, Tacoma and Bellingham, and reports show that they give more general satisfaction on short runs than the heavier cars which operate at a lower schedule speed.

Electric Road Competes for Freight.—The largest volume of freight business in the history of the company is being handled by the Louisville & Interurban Railroad, Louisville, Ky. Steam roads with which the electric lines are in competition through the territory which they serve have been glad, apparently, to leave the local shipping to the latter while they take the long-haul traffic. R. H. Wyatt, general freight and passenger agent of the company, is making the most of the opportunity, which he regards as offering the electric service a long-wanted chance to demonstrate its capabilities. If satisfactory service is furnished at a time when the steam roads are giving unsatisfactory service, Mr. Wyatt believes that later on, when conditions return more nearly to normal, the electric lines will be able to retain much of their present business. In order to give the best service possible Mr. Wyatt hopes to work the freight equipment to its capacity. A contract was made recently with the Kosmos Portland Cement Company, which has a plant southwest of the city, to bring from four to seven cars a day to Louisville. The demand for cars is so great that it has been necessary to require the shipper to promise to unload the cars promptly. The company informs the consignee by telephone of the exact time when a shipment will be at its destination and urges that arrangements be made for immediate unloading.

Personal Mention

Valentine Burley is superintendent of transportation of the Binghamton (N. Y.) Railway, having succeeded William G. Decker, resigned.

A. S. Nichols, formerly local manager of Stone & Webster properties in Fort Madison, Wis., has been appointed to succeed W. L. Weston in a similar capacity in Paducah, Ky.

John W. McCardle, a former member of the Indiana Board of Tax Commissioners, has been named a member of the Public Service Commission of Indiana.

W. G. Murrin, whose promotion was reported recently, is now assistant general manager of the British Columbia Electric Railway, Vancouver, B. C. Mr. Murrin was formerly general superintendent.

A. B. Paterson has resigned as general manager of the Meridian Light & Railway Company, Meridian, Miss., operated by H. L. Doherty & Company, to become bond department representative of the Doherty interests in New Orleans and vicinity.

William J. Wood, a special examiner for the Interstate Commerce Commission, has been appointed to fill a vacancy on the Public Service Commission of Indiana. Mr. Wood was formerly a member and chairman of the Railroad Commission of that State.

H. E. Brandli, formerly general manager of the Citizens' Gas, Electric & Heating Company, Mount Vernon, Ill., succeeds A. B. Patterson as general manager of the Meridian Light & Railway Company, Meridian, Miss. The two companies are operated by H. L. Doherty & Company.

M. S. Sloan has been relieved of certain operating details in the management of the New Orleans Railway & Light Company, New Orleans, La., following the appointment of N. H. Brown as general superintendent of transportation. Mr. Sloan will continue as general manager of the company.

Bert Greenway has been appointed superintendent of the Grand Forks (N. D.) Street Railway to succeed W. J. Brekke, who has entered private business in Grand Forks. Mr. Greenway for the past four years has been general foreman and assistant superintendent of the Regina (Sask.) Municipal Railway.

Walter Alexander, chairman of the Wisconsin Railroad Commission until May 1, has accepted the position of superintendent of motive power of the Chicago, Milwaukee & St. Paul Railroad. Mr. Alexander was master mechanic of that road before his appointment as a member of the commission two years ago.

Carl H. Mote has succeeded Joseph L. Reiley as secretary of the Public Service Commission of Indiana. Mr. Mote was formerly engaged in newspaper and magazine work and is a past editor of the Indianapolis *Sun*. He has also had a wide experience as a statistician for public service corporations. He is the author of "Industrial Arbitration" and joint author of "Learning to Earn," a book on the subject of vocational education.

Ernest I. Lewis, a special correspondent for the Indianapolis *News*, has been appointed a member of the Public Service Commission of Indiana. Mr. Lewis has traveled extensively here and abroad, and as a result of his studies has collected much valuable information on public service problems. He assisted in organizing the Citizens' Gas Company, Indianapolis, and largely to his initiative are credited the present low rates for gas in Indianapolis.

P. D. Kline, who resigned on April 1 from the position of general manager of the Ogden, Logan & Idaho Railway, Ogden, Utah, has accepted the position of manager of the La Crosse district of the Wisconsin-Minnesota Light & Power Company. This property is operated by the American Public Utilities Company of Grand Rapids, Mich. A biographical sketch of Mr. Kline appeared in the ELECTRIC RAILWAY JOURNAL for March 31, page 620.

J. V. DAVIES

J. Vipond Davies, chief engineer of the Hudson & Manhattan Railroad, New York, N. Y., has been elected vice-president and a director of the company to succeed the late Richard W. Meirs. Mr. Davies is a native of South Wales and was graduated from Wesleyan College and the University of London. He is widely known as a member of the firm Jacobs & Davies, consulting engineers, New York, Montreal and London, with which he became connected in 1894. He is also consulting engineer for the Brooklyn (N. Y.) Rapid Transit Company. Mr. Davies has had a wide experience as a designing and construction engineer of both railroads and tunnels in different parts of the United States. His firm, Jacobs & Davies, designed and built the tunnels under the Hudson River, into New York, Jersey City and Hoboken, for the Hudson & Manhattan Railroad. In 1914 the Tilford gold medal was awarded him by the Institution of Civil Engineers, London, England, for his paper "Extensions of the Hudson River Tunnels of the Hudson & Manhattan Railroad."

W. L. Weston, operating manager of the Paducah (Ky.) Traction Company and the Paducah Light & Power Company, has been transferred to Fort Madison, Wis., as manager of the Stone & Webster properties in that city. Mr. Weston has been in public service work since 1906, when he became purchasing agent for the Northern Texas Traction Company, Fort Worth, Tex. He was later appointed assistant to the general superintendent of that company and in 1910 became general manager of the Tampa & Sulphur Springs Railway, Tampa, Fla. Mr. Weston has been local manager of the Paducah properties since 1912.

U. S. Sliter, who since 1914 has been superintendent of the efficiency department of the San Francisco-Oakland Terminal Railways, Oakland, Cal., has been appointed assistant superintendent of transportation. Mr. Sliter's duties during the last three years were confined partly to the building up of higher operating standards through the use of the coasting recorder, and in this work he has been very successful. He has also handled much of the work pertaining to jitneys and other transportation problems. Mr. Sliter went to Oakland in 1912, largely to reroute and reschedule the system. Previous to that time he served with the British Columbia Electric Railway, Vancouver, B. C., the Detroit (Mich.) United Railway and the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. With the last-named company Mr. Sliter spent eight years, part of the time as superintendent of transportation.

A. R. Whaley, vice-president of the New York, New Haven & Hartford Railroad, in charge of operating, engineering, construction and maintenance, will resign from active service with the company on May 31, to rest for a few months. Mr. Whaley is a native of Rhode Island, and has been in railway service since 1877, when he was employed as a freight brakeman on the Providence & Worcester Railroad. This road became a part of the New Haven system and Mr. Whaley, after serving in different positions, finally was made division superintendent, first of the Worcester division, and then in charge of operation, of the road from New York to New Haven, and the Harlem River and New Haven terminals. In 1907 Mr. Whaley became connected with the New York Central Railroad as general superintendent of its electric division and general manager of the New York terminal, with supervision over all trains of that company running into the city. He also had charge of certain details of the reconstruction of Grand Central Terminal. Mr. Whaley, through his long period of service, probably has a personal acquaintance with more New England railroad men than any other railroad official in the East.

Andrew E. Kalbach has been appointed receiver of the Second Avenue Railroad, New York, N. Y., to succeed the late John Beaver. He was formerly general manager and electrical engineer of the New York City Interborough Railway, now controlled by the Third Avenue Railway, of that city. Mr. Kalbach is a Naval Reserve officer, having been graduated from the Annapolis Naval School. He resigned from the navy in 1903 to become assistant engineer for the Rapid Transit Subway Construction Company, New York, and was afterward made general manager and engineer for the New York City Interborough Company, the majority of whose stock was then controlled by the Interborough Rapid Transit Company. In 1914 Mayor Mitchel of New York appointed Mr. Kalbach deputy commissioner of street cleaning of the Bronx.

O. R. Sturzinger, who has resigned as superintendent of the Northwestern Ohio Railway & Power Company, Toledo, Ohio, began electric railway work at the age of twenty-three, when he was employed in the construction of the Sandusky, Milan & Norwalk Electric Railway. Upon its completion he served as conductor for six years, and was later made assistant general manager. In 1899 the Sandusky & Interurban Railway was under construction from Sandusky to Lorain and Norwalk, and Mr. Sturzinger became foreman of overhead construction for this road. These two properties were consolidated with the Lake Shore Electric Railway, Cleveland, Ohio, and Mr. Sturzinger remained with the company as assistant to the superintendent of motive power. In 1903 he became connected with the Toledo, Port Clinton & Lakeside Railway, which was then being constructed, and was appointed master mechanic. Four years later he was promoted to the position of general superintendent and was retained as superintendent with the company's successor, the Northwestern Ohio Railway & Power Company, until the present time. Mr. Sturzinger traveled abroad in 1913 and witnessed electric railway operation and visited power plants in several foreign countries. He intends to remain in electric railway service.

H. E. VORDERMARK

H. E. Vordermark, who has been elected vice-president and treasurer of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., as noted recently in the ELECTRIC RAILWAY JOURNAL, has spent virtually all of his business career in the local railway service in Fort Wayne. Soon after acquiring a high school education and a business training, he accepted a position as secretary to the general manager of the local company, then known as the Fort Wayne Electric Railway. In 1898 he was appointed auditor and retained this position when the company was consolidated with the Fort Wayne & Wabash Valley Traction Company. The Fort Wayne & Northern Indiana Traction Company later acquired this property and Mr. Vordermark was made auditor and secretary. He is still retained in the latter position. In the additional capacity of vice-president and treasurer he succeeds Henry C. Paul, who resigned in order to devote more time to other interests in Fort Wayne. Mr. Vordermark's duties as auditor are being assumed by his former assistant, Fred H. Schmidt.

Obituary

R. J. Jones, treasurer of the Tidewater Power Company, Wilmington, N. C., died at his home in that city on April 30 after a short illness. Mr. Jones was one of Wilmington's oldest and most prominent citizens. Until three weeks before his death he engaged actively in his duties in connection with the railway and other local interests with which he had been connected for a period covering nearly half a century.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

Billings Railway, Light & Power Company, Billings, Mont.—Incorporated to take over the property of the Billings Traction Company and electrify the line and also possibly to construct an interurban line to Laurel. Capital stock, $300,000. It is planned to have electric cars in operation in Billings by Aug. 1.

***Catskill Mountain Railroad Corporation, Catskill, N. Y.**—Incorporated to construct a narrow-gage surface railway to be operated by steam, gasoline or electricity. Capital stock $100,000. Incorporators: E. E. Olcott, A. V. S. Olcott and G. H. Beach, Catskill.

FRANCHISES

Globe, Ariz.—The Globe-Miami Railway has received a franchise from the City Council to construct a line in Globe. The company proposes to build an electric railway from Globe to Miami. Edgar Sultan, Globe, secretary. [April 28, '17.]

Alameda, Cal.—The San Francisco-Oakland Terminal Railways has asked the City Council of Alameda for a resettlement franchise such as was recently voted by the citizens of Oakland.

Eagle Rock, Cal.—Bids will be received by the Board of Trustees of Eagle Rock until May 21 for a fifty-year franchise for an electric railway across Colorado Boulevard between Central Avenue and Rowland Avenue.

Rialto, Cal.—The Pacific Electric Railway has received a franchise from the City Council to operate an electric railway in Rialto.

Kansas City, Mo.—The Kansas City Railways has received franchises from the City Council to construct a double-track extension to the Twenty-seventh Street line from Chelsea to Denver Avenues and to double-track its line on Independence Avenue from Hardesty to Topping Avenues.

Bexley, Ohio.—The Ohio Electric Railway has received a franchise from the City Council to operate cars on East Main Street instead of in Mound Street, Bexley.

Windsor, Ont.—The Sandwich, Windsor & Amherstburg Railway has asked the City Councils of Sandwich, Windsor and Walkerville for an extension of its franchises to 1931.

Norfolk, Va.—The Virginia Railway & Power Company has abandoned its franchise in the Campostella section.

TRACK AND ROADWAY

Pacific Electric Railway, Los Angeles, Cal.—It is reported that the Pacific Electric Railway will construct an extension from Glendora to San Dimas.

***Wilmington, Del.**—James M. Satterfield, Dover, representing Lindes & Company, Franklin Bank Building, Philadelphia, has opened negotiations in the north part of Delaware for a trolley road which will extend from Wilmington to the lower boundary of the State, a distance of 90 miles. Such a road, if constructed, would parallel the Pennsylvania Railroad and would share in the freight and passenger traffic from this district. The consent of the Newcastle County authorities is being sought first and if that is obtained the company will be incorporated under the laws of the State of Delaware.

St. Petersburg & Gulf Railway, St. Petersburg, Fla.—Work will be begun at once by this company on the construction of a new bridge across Coffee Pot Bayou.

Springfield (Ill.) Consolidated Railway.—As a result of the State centennial plan to remove the tracks in Capitol Avenue, the Springfield Consolidated Railway has asked the Legislature for permission to extend its tracks from Second and Monroe Streets to Second and Charles Streets.

Tri-City Railway Davenport, Iowa.—The Council of the city of Moline, Ill., will ask the Tri-City Railway to lay its track on Fifth Avenue in the center of the thoroughfare. In resolutions adopted by the Council the recommendation is made that with the widening of Fifth Avenue the Tri-City Railway shall put in double tracks from Seventeenth Street to Fifteenth Street, and that there be four curves at the intersection of Fifth Avenue and Fifteenth Street and single track in the center of the widened avenue from Fifteenth to Thirteenth Street. Owing to the scarcity of steel rails of the kind desired, the resolutions included recommendations of the Shanghai type of rails.

Des Moines (Iowa) City Railway.—This company contemplates the reconstruction of its University line this summer.

Kentucky Traction & Terminal Company, Lexington, Ky.—An ordinance has been adopted by the City Council of Frankfort requiring the Kentucky Traction & Terminal Company to replace the wooden poles now in use on parts of Main and St. Clair Streets with ornamental steel poles.

Salem & Pennsgrove Traction Company, Salem, N. J.—Citizens of Quinton have petitioned the Salem & Pennsgrove Traction Company to extend its trolley line from Salem to Quinton. Rights-of-way have been donated for the 3 miles.

New York & Queens County Railway, New York, N. Y.—The Public Service Commission for the First District of New York, on motion of Commissioner Travis H. Whitney, has sent to the Board of Estimate and Apportionment a letter urging that body to consider favorably the construction of a temporary extension by the New York & Queens County Railway from its Flushing line at Jackson Avenue through Shell Road, Peartree Street and Roosevelt Avenue to the Alburtis Avenue station of the Corona rapid transit line. The proposed new extension will be approximately ¾ mile in length.

Schenectady (N. Y.) Railway.—A contract has been awarded by the Schenectady Railway to W. S. Rae, Pittsburgh, Pa., for the reconstruction of two 151-ft. spans of the Alplaus Bridge over the Mohawk River at about $50,000, to provide the necessary clearances over the channels of the barge canal. Traffic will be maintained while the work is in progress. Work has been begun by the company removing the State Street bridge over the Erie Canal and filling in the canal to make a practically level grade of the street over the old canal.

Black River Traction Company, Watertown, N. Y.—This company is considering the construction of an extension to the Maxim munition plant in Water Street.

Tulsa (Okla.) Street Railway.—Construction has been begun by the Tulsa Street Railway on an extension to West Tulsa. An agreement has been reached between the company and the County Commissioners for the use of the new Arkansas River bridge, the company to pay a rental of $150 a month. In crossing the bridge the company will use the common track with the Tulsa Traction Company.

Toronto, Barrie & Orillia Railway, Toronto, Ont.—The Ontario Legislature has refused to grant the application of the Toronto, Barrie & Orillia Railway for an amendment to its act of incorporation to extend the time within which the company's line was to be built. The company was originally incorporated in 1910 as the Monarch Railway, the title being changed in 1913. No construction work has been done. [Feb. 26, '16.]

Toronto (Ont.) Suburban Railway.—This company's extension from Lambton to Guelph, 48 miles, has recently been placed in operation.

Welland, Ont.—Surveys have been completed of the proposed line from Welland to Port Colborne to Bridgeburg, which is to be built by the Ontario Hydroelectric Commission at an approximate cost of $10,000,000.

Klamath Falls (Ore.) Municipal Railway.—The only bid received by the City Council of Klamath Falls for the construction of a municipal railway from Klamath Falls to Dairy, 20 miles, was that from Robert E. Strahorn at $300,-

000. Construction work will be begun within thirty days. [May 5, '17.]

Oregon Electric Railway, Portland, Ore.—This company plans to begin work shortly on the construction of a new draw span at the bridge across the Willamette River between Harrisburg and Junction City. Ten carloads of steel will be required in the construction of the span, which will be of the modern lift type and will permit the passage of the larger river boats should occasion demand it.

Southern Pacific Railway Company, Portland, Ore.—The plan of the Southern Pacific Company to discontinue street car service in Albany on April 30 has been postponed. Following the announcement of the company, a petition was circulated among business men of the city, asking the company to leave the cars in Albany and reconsider taking up the track. Business men have offered to co-operate with the company and assist in making the line pay.

Southern Pennsylvania Traction Company, Chester, Pa.—Contracts have been let by the Southern Pennsylvania Traction Company for the reconstruction of its line from Darby to Eddystone, 6 miles.

Reading Transit & Light Company, Reading, Pa.—Work has been begun by the Reading Transit & Light Company laying new tracks in Mount Penn from the eastern city line to Twenty-third Street. The work will be continued on Twenty-third Street to Friedensburg Road.

South Carolina Light, Power & Railways Company, Spartanburg, S. C.—This company will construct an extension to Whitney and will also reconstruct part of its Clifton line.

Cleburne (Tex.) Traction Company.—The City Council of Cleburne has authorized the removal of the physical property of the Cleburne Traction Company from the streets of Cleburne, and appointed W. W. Smith, J. W. Floore, Jr., and Murphy Pickle as an equalization board.

Dallas Northwestern Traction Company, Dallas, Tex.—Final surveys are being made for the right-of-way of the Dallas Northwestern Traction Company from Dallas to Slidell, via Denton. The first work will be done between Denton and Slidell and that part of the line will be placed in operation in a short time. The stockholders of the Standard Utilities Construction Company, which will build the line, have elected officers as follows: C. F. Hopkins, Tulsa, Okla., president; Ira E. Cornelius, Muskogee, Okla., secretary and treasurer; A. V. Demayo, New York, vice-president and general manager, and F. W. Hopkins, Jr., Springfield, Mo., assistant secretary and treasurer. [May 5, '17.]

Interstate Electric Corporation, San Angelo, Tex.—Plans are being made by the Interstate Electric Corporation to begin work within the next few weeks on its proposed system in San Angelo.

SHOPS AND BUILDINGS

Caldwell (Idaho) Traction Company.—It is reported that this company proposes the construction of a passenger station in Caldwell.

Fort Wayne & Northwestern Railway, Kendallville, Ind.—A new passenger and freight station will be built by the Fort Wayne & Northwestern Railway at Waterloo.

Waterville, Fairfield & Oakland Railway, Waterville, Me.—A new freight station will be built by this company at Waterville.

Ohio Electric Railway, Springfield, Ohio.—This company will construct a new passenger and freight station at Ottawa.

London & Port Stanley Railway, London, Ont.—It is reported that the London & Port Stanley Railway will erect a new building for offices and station purposes at Talbot Street, St. Thomas.

Reading Transit & Light Company, Reading, Pa.—This company will construct a large freight station to take the place of the present one at Penn and DeKalb Streets, Reading.

Virginia Railway & Power Company, Richmond, Va.—A contract has been awarded by this company to John T. Wilson Company, Richmond, for the erection of a storage warehouse. The structure will be 27 ft. x 40 ft., of concrete, and will cost about $5,300.

POWER HOUSES AND SUBSTATIONS

Kankakee (Ill.) Electric Railway.—A report from the Kankakee Electric Railway states that it has received a new 258-hp. boiler from the Erie City (Pa.) Iron Works, and will install same within the next thirty days.

Sioux City (Ia.) Service Company.—It is reported that the Sioux City Service Company contemplates the construction of a new power plant to cost about $750,000.

United Railways & Electric Company, Baltimore, Md.—This company has awarded a contract to the West Construction Company, Baltimore, Md., for the erection of a new substation, 60 ft. x 90 ft., at Sollers Point.

New York Municipal Railway Corporation, Brooklyn, N. Y.—The Public Service Commission for the First District of New York has approved an award by the New York Municipal Railway Corporation to A. Pasquini, New York City, of a contract for the new Ridgewood substation to be used in connection with the furnishing of current for the operation of the Fourteenth Street-Eastern line and other new rapid-transit lines in Brooklyn. The contract price is $59,990. The original low bidder was William Flanagan when bids were received by the Brooklyn company on April 9. Later Mr. Flanagan withdrew his offer and the company prevailed upon Mr. Pasquini, who had made a bid of $64,080 for the work, to withdraw that bid and accept a contract at the figure at which Mr. Flanagan's bid had been made.

Oklahoma City, Okla.—E. P. Truett of New York and Wardis Arnold of Chicago have arrived at Ada, Okla., to begin work on a large electric power plant to be built on the Canadian River near Shawnee. The plant will cost $500,000 and will supply electric current for several interurban lines out of Oklahoma City and other towns, and will also supply current for lighting and power to the cities of Shawnee, Ada and Oklahoma City.

Harrisburg (Pa.) Railways.—A report from the Harrisburg Railways states that during the next month the company will place a contract for one 500-volt rotary transformer. The company has ordered coal and ash conveying apparatus to be installed in its plant.

Reading Transit & Light Company, Reading, Pa.—Plans are being made by the Reading Transit & Light Company and the Metropolitan Electric Company to install underground wires in the existing conduit system in the business section of the city, including connections, etc., at a cost of approximately $1,000,000.

Rutland Railway, Light & Power Company, Rutland, Vt.—Work has been begun by this company on the erection of a new transmission line from the Rutland substation to Mendon and from Rutland to West Rutland. This line will be operated temporarily at 13,000 volts, but has been insulated for 44,000 volts, which will later be used. A transmission line from West Rutland to Castleton, about 12 miles, has been authorized. Material has been ordered and work will soon be begun.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—It is reported that this company will begin work immediately on the erection of a 25,000-volt transmission line from Fern Hill to Olympia to connect with the service lines of the Olympia Light & Power Company. The cost is estimated at $53,000.

Appalachian Power Company, Bluefield, W. Va.—This company plans to construct a $1,000,000 steam-driven electric generating station on the New River, between the Virginian and Norfolk & Western Railways. The equipment will include an 18,750-kw. turbine, three 1200-hp. boilers, etc. The plant may furnish electricity for the proposed Virginian Railway electrification at Clarks Gap and for the proposed extension of the Norfolk & Western Railway electrification east of Bluefield. An 18,750-kw. turbine and boilers have been purchased for the plant, but other details may not be decided upon for some months.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Reducing the Selling Cost

Office Hours for Salesmen a Help—Are Postcard Lists Effective?—Salesmen Make Too Many Trips

By E. C. JOHNSTON

Purchasing Agent East St. Louis & Suburban Railway, East St. Louis, Ill.

I have read with interest the article by L. W. Horne in the ELECTRIC RAILWAY JOURNAL of April 14, and while I agree with his ideas in some respects, I have found that all his suggestions do not always work out.

The selling expense of an article is often a very large item. I realize also that we pay our proportion of this expense whether it costs the manufacturer anything additional in order to sell us a particular item, or not. The manufacturer's article is priced on a basis of manufacturing plus certain selling expense, which is averaged. Of this I may pay my average share without causing any actual expense, while the other purchaser pays the same share and demands continual solicitation.

If Mr. Horne could devise some means that would enable the buyer to have a knowledge of all articles for sale or that would enable the salesmen to know just when to call on the buyer, it might prove a help; but to my mind it is foolish to assume that any arrangement could be made whereby the salesman of each and every article could be repaid for his time and expense by receiving an order when he calls. The proper method is to anticipate one's wants in such quantities that it will not be necessary to demand impossible deliveries. This, in turn, will give the purchasing agent the necessary time to investigate competitive articles.

POSTCARD LISTS FAIL TO BRING RESULTS

In regard to the suggestion that a manufacturing company should send out postcards listing a number of items which it handles, I do not believe that such a method of soliciting orders would be very successful. I judge from my own case. I pay absolutely no attention to such notices unless I am particularly interested in some special item, but my case is probably different from that of some of the men on smaller railways. Our purchasing department has direct authority over the stores department, and it has been our aim in the past to maintain a supply of all staple stock used by our various departments. Usually we have quantities sufficient to cover a period of from three to four months. I will admit, however, that due to the present condition of markets and factories, we are not always able to carry this amount of surplus stock. I do not think it possible to have a stock or supply room managed by any other officer than the purchasing agent, as I have never yet found an operating head of any department who could or who would anticipate his wants on each and every article used by his department. Some roads have the storeroom under the jurisdiction of the master mechanic, which to my mind is wrong, as the master mechanic is interested in a single line of materials and is not always familiar with market and delivery conditions.

Mr. Horne says it is usually found that the more times a salesman calls on a buyer the better success he has. This may hold good in some cases, but I do not believe it would cover the majority. The truth of the matter is, the more trips a salesman makes to this office without some excuse for his presence, the less successful he will be. Such a salesman is not only wasting his employer's time and money, but mine. I would much prefer, in 99 per cent of the cases covering salesmen's calls to my office, to be allowed the privilege of inviting these calls rather than having the salesmen periodically drop in.

I am thoroughly in accord with one of Mr. Horne's remarks, that there are too many supply men personally soliciting business. I don't mean by this that I do not want competition, because I believe that is up to the purchasing agent himself to demand if he so wishes. So far as a salesman making three or four calls in order to close a comparatively small order is concerned, I believe that is the salesman's fault.

Mr. Horne further states that if the railway men would take a definite "yes" or "no" attitude it would save time and money for the supply men. The average supply man resents anyone taking this attitude unless, of course, it is "yes." It cannot be yes in all cases.

"NO" ATTITUDE SAVES THE SALESMAN'S TIME

I believe the majority of the purchasing agents refrain from using the "no" attitude in order to save the salesmen from making additional trips to know why. I have found, in quite a number of cases where I took this attitude, that it took me longer and the salesman called oftener and caused more expense to his employer than if I had let the order take its course and the "no" be found out later. Of course, Mr. Horne's viewpoint is opposite to mine in several cases, because he is the seller and I am the buyer.

I have established office hours for sales representatives in order to be able to do something in addition to entertaining, and I have found this quite profitable. There are times, of course, that we do not follow this rule strictly. For instance, when a man from out of the city calls, I always give him an interview.

Truck Deliveries Put at Six Months

Reasons Given for Two to Three Months' Longer Delivery if Special Products Are Demanded

"Our customers are not expecting deliveries of trucks, except in emergencies, earlier than six months." This statement recently made by the sales manager of one of the large truck builders expresses in a nutshell the delivery situation as it exists to-day. In response to an inquiry from the purchasing department of a large operating property several truck builders recently were questioned on the delivery situation for their standard and for special types of trucks. The views of the manufacturers, which practically coincide, are expressed by the following statement: "It is necessary in these days to make a special ruling to suit each case as it comes up. We try to ascertain the conditions and wishes of our prospective customers and meet these as nearly as possible." This, in fact, is the spirit which has pervaded the electric railway industry during the war period. From all accounts this spirit prevails in this industry more than in almost any other. Sacrifices, uncalled for by strict business rules, have been made by both buyers and sellers when it has been found that a much-needed favor could be rendered. And above all, the involved relations, so far as purchasing is concerned, have plainly been seen in the need for forehandedness in buying and adherence to standards.

AS ONE MAN VIEWS AN ORDER

The car and truck builders urge standardization as much in the interest of the purchaser as in their own interest. One manufacturer has the following comment to make apropos of the present delivery situation: "I wouldn't attempt to quote anybody a price unless I knew definitely what he was seeking. It is the rarest exception for us to get an inquiry on any type of cataloged truck, because almost invariably something special is required in the way of wheels, axles, journal boxes, bearings or some other important part. And these items themselves usually are the limiting features for delivery. For example, a great many people want heat-treated axles and these are not obtainable in less than eight to ten months. Rolled steel wheels are hardly obtainable during the present year, except by accident, and I wouldn't want to offer or suggest off-hand as to when roller center or side bearings could be obtained."

STANDARDS SPEED DELIVERY

Just how much standards aid in making deliveries is plainly to be noted by one truck maker, who writes as follows regarding his production and delivery situation: "If standardized trucks of either city or interurban types, are ordered, and complete information is given us, we can make delivery in four months. As a matter of fact, however, it usually takes one month for completing the data. As the gears are liable to hold up delivery another month, the actual delivery period is about six months."

In discussing deliveries another manufacturer puts the saving at sixty to ninety days for a standard over a special truck. The reasonableness of the difference in delivery is easily seen and appreciated: "Standard designs, if used, not only reduce the work in the drafting room, but permit the use of present patterns and dies. They also avoid those troublesome shop-routine delays due to sidetracking of non-standard parts in a big busy shop."

Most of the slow truck deliveries of the last year have cost the truck builders more than their normal profits. The builders would have saved this if it had been humanly possible.

Contactor Signal Sales Analyzed

BY CARL P. NACHOD

President Nachod Signal Company, Louisville, Ky.

The refining process which trolley contactor control for automatic block signals has been undergoing during the last few years has greatly increased the field of usefulness and broadened the sales of this type of apparatus. It is now successfully used not only on single-track lines for both absolute and permissive signaling, but also on double-track lines for rear-end protection, and this at comparatively high speeds.

Contactor control has been applied to highway crossing bells for voltages as high as 1500 volts direct current, and it is well adapted for other uses, such as annunciators, headway recorders and for controlling station lights, etc. Our company brought out last year the first direct 1500-volt direct-current trolley contactor signals on the market. These are two-position absolute signals for single track and are provided with a preliminary at one end.

THE SALES ANALYZED

In an analysis of our business of the past year we find about 5 per cent of our sales were for double-track, rear-protection signaling, these being of the three-indication type and giving information two blocks in advance, some operating at train speeds of 50 m.p.h. with blocks averaging 0.4 mile long.

The type-CD signals are the most popular of our single-track signals, constituting 73 per cent of our total sales. These require two line wires and permit the utmost flexibility of car movements. About 10 per cent of our sales were the single-wire type-C signals—the original Nachod car-counting signal. The latter type does not permit as varied shifting movements as the type CD. About 10 per cent of our sales were of our type-MD signals. These have normally closed, hold-clear circuits and give a consecutive "answer back" or indication to the motorman.

Business in highway crossing signals has not yet attained the volume that we expect, but we are now furnishing various aspects, such as flashing lights and wigwags in combination with bells.

Our automatic headway recorder has been installed in many cities during the past year and the railway managements evidently think it of much value for checking schedules and locating service irregularities.

We were favored with an exceptional amount of business last year, and this year so far has been nearly equal to it. We feel the difficulty of obtaining material, even at the greatly increased prices now prevalent, but our policy has been to keep prices as low as possible.

Woes of the Malleable Iron Users

Line Material Manufacturers Greatly Hampered by Long and Uncertain Delivery Situation in Malleable Iron Industry

With some overhead line material manufacturers the malleable casting situation is now the most important factor so far as deliveries are concerned. The high prices which the manufacturers are offering to the foundries, although large compared with anything paid in earlier years, seem to be of no avail in obtaining work promptly. The foundries are filled beyond capacity, and since the overhead line material castings are of a higher quality than the ordinary run of malleables, the line material manufacturers are forced to pay an extra premium for quality work and also are confronted with exceptionally slow deliveries.

TEN MONTH MALLEABLE DELIVERIES

To quote one sales manager: "The best delivery, as near as we are able to determine, promised to-day by any malleable iron foundry on such castings as are used in making up finished line material, and particularly molded trolley line material, is from eight to ten months. Therefore, unless the line material manufacturer has already placed his orders with the foundry, he now finds it necessary to wait that length of time before he can obtain his castings for any particularly large order. For example: If he had placed orders four months ago for the necessary castings to be used in making up trolley material, these castings would in all probability not be shipped until the end of the next four or five months."

Another manufacturer, referring to line material requirements, has stated that his company is in a position to make shipments on bronze fittings within a week or ten days from the receipt of the order, and on 75 per cent of the malleable fittings he can now make delivery direct from the storeroom, but on the other 25 per cent of his list of standard articles, delivery must be delayed anywhere from three to six months. These articles are such, however, that if urgently needed bronze castings can be substituted for the malleable castings. This situation refers particularly to overhead switches and crossings. This manufacturer also states that on special overhead materials not regularly listed it takes from four to eight weeks to execute the orders; that is, assuming that the production of the device has to go through the consulting, blueprint and pattern stages, as well as through the shop. On a large construction order, if the fittings were standard, this manager reports that his company could make fairly regular weekly shipments after a start of about three weeks, *i. e.*, he could supply enough material to keep several line gangs busy.

The purchasing agent will appreciate the manufacturer's situation when it is stated that the average time of delivery on new malleable orders now approaches a full year, and this does not contemplate any special work, but just the regular run of patterns. The quality requirements are partly responsible for the long delivery. During the past year several overhead line material manufacturers have placed their malleable patterns with a number of foundries which undertook for the first time to make the high-quality castings required. The results were not satisfactory, and now those foundries which have had experience with overhead line material patterns assert their inability to make satisfactory line material malleable castings for less than 5 cents a pound increase over the regular run of malleable castings of the same weight. Thus the restricted number of plants from which the line material manufacturers may order high-grade malleables has had much to do with hampering the line material producers in making deliveries.

With pig iron approaching $50 a ton and asbestos, which is the largest ingredient in molded insulation, increasing from $30 to $80 a ton, it would seem difficult now for the line material manufacturers to make definite plans for the future, other than to urge purchasers to announce as early as possible any business which they intend to place.

Bound Catalog Finds Favor

Company Changes From Loose-Leaf to Bound Catalog—Recent Discussions on Standardizing Catalogs Effective

BY JAMES H. DREW
President Drew Manufacturing Company, Indianapolis, Ind.

This company began recently the compilation of a new catalog in the old standard bound-form style of the usual size. Since this discussion regarding a standard form of catalog has arisen, we have gone into the subject seriously, and are convinced that an 8½ in. x 11 in. size is the most practical to use. However, from past experience with our catalog in the hands of our customers and with the catalogs of people from whom we buy, in our hands, we know that a loose-leaf catalog is never kept up to date, and there are always either omissions of supplements or vague doubts as to whether the information contained in the catalog is down to the minute.

We have, therefore, changed our plans and will shortly issue a line material and railway specialties catalog in bound form 8½ in. x 11 in. in size. This will permit its being kept in vertical files, and if letter size circulars of special information or additional data are sent out referring to this catalog they can be filed in the catalog itself in the same manner that any other correspondence is filed. We believe this plan will be more convenient for purchasing agents and engineers. It will make the catalog readily accessible, and if any correspondence or bulletins relative to the matter contained therein are sent out, the greatest possibility of their being filed in the proper place will be obtained.

We have also discovered that illustrations, descriptive matter and list prices can be utilized to a greater advantage and at less expense than in the usual volume size of book. Another advantage is that an 8½ in. x 11 in. catalog, unless extremely bulky, will always remain flat when open.

Car Shortage Increases

According to the monthly statement of the American Railway Association, the net freight car shortage on April 1 was 143,059, the highest figure that has been reached in recent years. Since August, 1916, when there was a surplus of 9762 cars, the shortage has steadily increased, with the exception of the Jan. 1 report, which showed a reduction in the shortage amounting to 7130, bringing the shortage down to 62,247 on the first of the year. Railway officials continued to attribute the shortage to the abnormal amount of business and to the congestion in the East, due to lack of terminal facilities and of ocean tonnage to carry the freight away after it has arrived at the Atlantic seaboard.

There are about 2,300,000 freight cars in service in the United States. Thus a shortage of 143,059 cars represents over 6 per cent. In the fiscal year ended June 30, 1916, 2,336,291,000 tons of freight were carried on the railroads of the country, each ton being carried an average distance of 178 miles. The loss to the railroads through the car shortage will be appreciated when it is considered that the average amount received for transporting 1 ton of freight 1 mile in the year ended June 30, 1916, was 0.707 cent.

Ball Bearing Companies Merged

The S K F Administrative Company, 1 Wall Street, New York City, announces that hereafter it will direct the affairs of the S K F Ball Bearing Company and of the Hess-Bright Manufacturing Company. The board of directors of this company, which was recently incorporated in New York, consists of Frank A. Vanderlip, president of the National City Bank; Thatcher Brown of Brown Brothers; F. B. Kirkbride, S. Wingquist, Axel Carlander, Marcus Wallenberg, and B. G. Prytz, who was formerly president of the S K F Company, and who now will be the president of the new company. Budd D. Gray, formerly president of the Hess-Bright Company, will become technical adviser to the new company, which will thus have the benefit of his experience in its various interests. The new company is extending the manufacturing facilities of both the Philadelphia and Hartford plants, in order to meet the demand for the company's products.

NEW YORK METAL MARKET PRICES

	March 31	May 10
Prime Lake, cents per lb	35	31
Electrolytic, cents per lb	35½	31
Copper wire base, cents per lb	42	36
Lead, cents per lb	9½	10⅝
Nickel, ingot, cents per lb	50	50
Spelter, cents per lb	10¾	9⅝
Tin, Straits, cents per lb	55⅞	59⅜
Aluminum, 98 to 99 per cent, cents per lb	55	60

OLD METAL PRICES

	March 31	May 10
Heavy copper, cents per lb	29	25
Light copper, cents per lb	24¾	22
Red brass, cents per lb	20	18½
Yellow brass, cents per lb	19	17½
Lead, heavy, cents per lb	8	8
Zinc, cents per lb	8	7
Steel car axles, Chicago, per net ton	$38	$41.50
Iron car wheels, Chicago, per gross ton	$22	$24.25
Steel rail (scrap), Chicago, per gross ton	$27.50	$31.50
Steel rail (relaying), Chicago, per gross ton	$34	$39
Machine shop turnings, Chicago, per net ton	$9.50	$11.00

CURRENT PRICES FOR MATERIALS

	March 31	May 10
Rubber-covered wire base, New York, cents per lb.	42	36½
No. 0000 feeder cable (bare), New York, cents per lb.	42	36½
No. 0000 feeder cable stranded, New York, cents per lb.	39¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	39½	33
No. 6 copper wire (bare), New York, cents per lb.	42	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40	$40
Rails, heavy Bessemer, Pittsburgh, per gross ton	$38	$38
Wire nails, Pittsburgh, per 100 lb	$3.20	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.65	$3.85
Steel bars, Pittsburgh, per 100 lb	$3.75	$4.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$4.85	$6.35
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$6.55	$7.55
I-beams over 15 in., Pittsburgh, cents per lb.	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	4.05	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	3.85	4.15
Cement (carload lots), New York, per bbl	$2.02	$2.12
Cement (carload lots), Chicago, per bbl	$2.06	$2.16
Cement (carload lots), Seattle, per bbl	$2.60	$2.50
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.11	$1.21
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.02	$1.22
White lead (100 lb. keg), New York, cents per lb.	10¼	11¼
Turpentine (bbl. lots), New York, cents per gal.	45	50

ROLLING STOCK

Indianapolis & Louisville Traction Railway, Scottsburg, Ind., is in the market for one trailer box car and two flat cars.

Hutchinson (Kan.) Interurban Railway Company is remodeling and rebuilding a number of cars which will later be adapted for one-man operation. All cars remodeled will be equipped with National Pneumatic Company's door and step mechanism, Westinghouse 12-A motor equipments and Taylor electric trailer trucks.

El Paso (Tex.) Electric Railway has specified the following details of equipment for the ten double-end pay-as-you-enter safety motor cars which are now being built for this company by the American Car Company, St. Louis, Mo.:

Seating capacity	34
Length over bumpers	27 ft. 9½ in.
Length over vestibule	26 ft. 9½ in.
Width over all	8 ft. 0 in.
Rail to trolley base	12 ft. 6 in.
Body	Semi-steel
Interior trim	Statuary bronze
Headlining	None, rafter finish
Roof	Arch
Air brakes	Safety Car Devices Company
Axles	Brill
Bumpers	American Car, channel iron
Car trimmings	Brill
Couplers	None, pull bars used
Curtain material	Pantasote
Door mechanism	Safety Car Devices Co.—air operated
Hand brakes	American Car, with Pittsburg ratchet drop handle
Designation signs	Hunter
Headlights	Golden Glow, S-M-95
Journal boxes	Brill
Motors	Two inside hung, make not specified
Sanders	Keystone air sanders
Sash fixtures	O. M. Edwards
Seats	Heywood Bros. & Wakefield
Seating material	Mahogany, wood, steel and canvas lined rattan
Springs	Brill
Step treads	Feralun
Trolley catchers	Keystone
Trucks	Brill 78-M-1 special
Ventilators	Utility Ventilator Company
Wheels	24-in. diam, 2½ in. tread, ¾ in. flange
Special devices	Faraday high voltage push button system

Union Light & Power Company, Fargo, N. D., expects to purchase fifteen new steel cars. They will be one-man pay-as-you-enter cars and will cost approximately $75,000.

Houston (Tex.) Electric Company is having eighteen single-end pay-as-you-enter one-man safety cars built in St. Louis by the American Car Company. These cars will be equipped with Safety Car Devices Company's air brakes and safety control equipment.

United Railways & Electric Company, Baltimore, Md., will soon place an order for eighty semi-convertible double-truck pay-as-you-enter cars similar to the 100 cars recently purchased from The J. G. Brill Company. It is said the new cars will be of greater capacity than the ones in use at present on the lines of this company.

Seattle (Wash.) Electric Company, noted in the April 21 issue as being one of the companies for which Stone & Webster, Boston, Mass., ordered 119 cars from the American Car Company, has specified the following details for the twenty-five pay-as-you-enter one-man safety cars:

Number of cars ordered	25
Type	One-man safety cars
Seating capacity	36
Length over bumpers,	27 ft. 9½ in.
Length over vestibule,	26 ft. 9½ in.
Width over all	8 ft. 0 in.
Height, rail to trolley base,	12 ft. 6 in.
Body	Semi-steel
Interior trim	Statuary bronze
Headlining	None, rafter finish
Roof	Arch
Air brakes,	Safety Car Device Company's
Axles	Brill
Bumpers,	American Car—Channel iron
Car trimmings	Brill
Couplers	None, pull bars used
Curtain material	Pantasote
Designation signs	Hunter
Door mechanism,	Safety Car Device Company's air operated
Hand brakes,	American Car with Pittsburg ratchet drop handle
Headlights	Golden Glow,
Journal boxes	Brill
Sanders	Keystone air sanders
Sash fixtures	O. M. Edwards
Seats, style,	Heywood Bros. & Wakefield
Seating material,	Mahogany wood, steel and canvas lined rattan
Springs	Brill
Step treads	Feralun
Trolley catchers	Keystone
Trucks, type	Brill 78-M-1
Ventilators	Utility Ventilator
Wheels,	24 in. Diam. x 2½ in. tread x ⅝ in. flange
Special devices,	Faraday high-voltage push button system

TRADE NOTES

Western Electric Company, Trenton, N. J., has filed notice of an increase in its capital from $15,750,000 to $30,750,000.

Okonite Company, New York, N. Y., has moved its offices to the seventh floor of the Astor Trust Building, 501 Fifth Avenue.

MacBeth-Evans Glass Company, Pittsburgh, Pa., announces that its general offices are to be in the new Chamber of Commerce Building, and will occupy the fourteenth floor.

Hyatt Roller Bearing Company, Newark, N. J., announces that due to advances in its costs of raw materials ranging from 10 to 50 per cent, it has been found necessary to increase its prices, effective May 15.

Tuco Products Corporation, New York, N. Y., has been incorporated for $500,000. The company, which was organized by Henry G. Wenzel, William H. O'Neill and James Carty, will manufacture railway cars.

Dunn Wire-Cut Lug Brick Company, Conneaut, Ohio, announces that Guy Robert Ramsey, associate member, A. S. C. E. of Orlando, Fla., has joined the engineering staff of this company and will be division engineer for the Southern States, with headquarters at Atlanta, Ga.

Copeland-Inglis Shale Brick Company, Birmingham, Ala., of which Beattie A. Inglis is vice-president and treasurer and W. Lawton Inglis is secretary, has become a licensee of the Dunn Wire-Cut Lug Brick Company of Conneaut, Ohio, and will henceforth make wire-cut lug paving brick.

John C. Dolph Company, Newark, N. J., manufacturer of insulating and protective varnishes, announces the completion of additions to its plant which will double its capacity. These additions include new executive offices and a new enlarged insulating laboratory.

S K F Ball Bearing Company of California, Inc., San Francisco, Cal., has been organized in order to supply more readily the rapidly increasing demand for S K F ball bearings on the Pacific Coast. The main office of this company, under the direction of A. M. MacLaren, has opened in San Francisco at 341 Larkin Street, and at this office a large and assorted stock of bearings will be carried.

General Electric's New Sales Manager

JOHN G. BARRY

As was announced in last week's issue of the ELECTRIC RAILWAY JOURNAL, John G. Barry has been appointed general sales manager of the General Electric Company. This appointment commends itself to his large circle of friends in the electric railway industry as most fitting and well deserved. Mr. Barry is a man who does things. He gets results. His forceful personality is an integral part of that industry. It is a pleasure to learn that he will continue his managership of the railway department along with the more general responsibilities of his new position.

Men of Mr. Barry's type deserve to succeed, because they put first things first, "plug hard" at their work, and at the same time realize that good-fellowship is not inconsistent with hard work. Of course, these characteristics did not in themselves insure Mr. Barry's promotion, but they are cited as indications of the strong personality behind them. Promotion came in this case, as it does in others, because he was the best-fitted man available for the higher job, that's all. His consistent record of progress should be inspiring to all ambitious young men, especially those in the electric railway business field. Here it is: After a high school course, entered employ Thomson-Houston Company, Lynn, Mass., in production department; transferred to commercial department, Boston office; in 1894, two years after combination of company with Edison General Electric Company to form General Electric, transferred to Schenectady, soon thereafter being made assistant manager railway department and manager in 1907; promoted to be sales manager, May, 1917, at the age of 47.

Besides being useful to the General Electric Company, Mr. Barry takes a prominent part in the civic activities of Schenectady. He is a director of the Schenectady Trust Company, served on the school board for several years, and lives up to the duties of a good citizen in every possible way. In his business affairs he is frank in stating what he wants and why he wants it, but is considerate of the wishes of others. He has the knack of doing things expeditiously without sacrifice of accuracy. Everybody trusts him, everybody likes him. The ELECTRIC RAILWAY JOURNAL extends to him on behalf of the industry the best wishes of all for his continued and increasing success.

ADVERTISING LITERATURE

Van Dorn & Dutton Company, Cleveland, Ohio, has issued a bulletin illustrating its different types of gears.

National Lead Company, New York, N. Y., is distributing a booklet "Red Lead and How to Use It," by Prof. A. H. Sabin.

American Electrical Works, Philipsdale, R. I., has issued a bulletin announcing charges for reels and spools which indicate higher prices on several sizes made necessary by advances in the cost of raw materials and of manufacture.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued leaflet 3976 illustrating its outdoor metering equipments. These are adapted for use on transmission lines where the expense of a substation is not warranted.

Ohio Brass Company, Mansfield, Ohio, is distributing an attractive bulletin on its gas-weld rail bonding process. Applications of this type of bonding in paved streets, on open track and on the elevated are described and illustrated, showing that this process is suitable to all conditions. The method of testing rail bonds by the use of two millivoltmeters to determine the number of feet of rail equivalent to 1 ft. of joint is explained.

Electric Railway Journal

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Increased Fare Movement Is Widening

WITH the appointment of a special committee of the New York Electric Railway Association to consider ways and means of increasing the fares on street railways in New York State, and with the informal presentation of their case to both the First and Second District Commissions this week, the movement for a general increase in fares throughout the State has received a decided impetus. Nor is this the whole of our story this week. The Pennsylvania Street Railway Association has authorized the appointment of a committee of five to consider the desirability of concerted action on the subject of higher fares in that State. The tendency is encouraging. Of all industries in the country electric railways have probably needed additional revenue the longest and the most, but it is to be hoped that their condition will be bettered in the near future. Now is the time for real teamwork on the part of all electric railways.

A CHANCE TO IMPROVE OPERATING CONDITIONS

Although there may be differences of opinion on the desirability of drastic retrenchment for the nation's industries as a means for meeting the burdens of war, there can be no doubt that anything that adds to real efficiency should be encouraged. For most industries this suggestion would, of course, be a particularly unnecessary platitude, but in the case of electric railways there are several opportunities to improve effectiveness of operation which are thoroughly understood but which generally have not been introduced because of the public's inertia or unreasoning opposition. Among them may be cited the skip stop plan, which, in any one of its various methods of application, permits faster schedules and thus increases the amount of service that may be provided with any given amount of equipment. There are also the use of light-weight, one-man cars for lines having thin traffic, the readjustment of factory closing hours to distribute the evening peak, and the free extension of the turn-back car principle to reduce light-load car-mileage. All of these have been demonstrated to be effective in improving efficiency and thus conserving the energies of both labor and capital—and any conservation of our national energy will give us just so much more strength for the gigantic task now facing us. The public is, to-day, beginning to realize this, and if it has not an open mind now it never will have one. The present, therefore, is the psychological moment to ask for public co-operation in regard to improved methods of operation, and should public attention be called again to the fact that means for increasing efficiency (such as those just mentioned) may be promptly introduced if only each community will withdraw its arbitrary opposition, we believe that public opinion will view the matter in a new and reasonable light.

HOW THE COMMISSIONS CAN HELP

The duty of commissions is to secure the most efficient operation of public utilities. This is as true in war times as in peace times, if not more so. Public utilities are of such vital importance to the nation that their services must be maintained, and if under war conditions added burdens of operation are imposed, there is all the more reason why public service commissions should handle their work in a constructive way. The nation needs to have its utilities operating in the fullness of their powers, and the commissions must be expected to do their bit in bringing this about. Can the commissions help in the present situation? They can, and in many ways besides that of treating in a broad-minded way the immediate need of electric railways for higher revenues, as discussed elsewhere. They can help to retain in service an adequate number of employees by presenting the needs of the railways to the military authorities. They can aid in securing proper recognition from the national fuel committee in regard to the movement of utility coal. They can co-operate with the utilities to make the public see the advisability of such economies as those noted in the previous paragraph. These are a few of the problems in the solution of which the commissions should now be actively engaged, looking toward the more efficient operation of the great national industrial machine which must be the backbone of any successful front presented against the enemy.

WAGES, FARES AND DIVIDENDS

An award like that of the Middlesex & Boston arbitration board, abstracted elsewhere in this issue, which increases wages with full recognition that by such action the stockholders will be stripped of substantially all, if not quite all, of their returns from their investment at the present rate of fare, is a challenge which the public itself must heed in the near future. The question is in reality very simple. No one but the patrons of a street railway meets the cost of its transportation service, and that cost must include a fair return upon the investment if the service is to keep pace with the demands of the times. This is necessary because no equivalent for street railway service has yet been discovered, sporadic jitney competition to the contrary notwithstanding. The whole fare problem is merely a question in arithmetic. All costs must be met by the public, either in the form of adequate compensation to private management or as increased taxation under public ownership. Even under public ownership the expenses must be met, and it is "up to" the public to decide whether it will support initiative and ability as associated with private management under public regulation, or will turn its utilities over to the tender mercies of the professional politician and put up with that stagnation of progress which is the great blight upon governmental efforts to carry on industry.

COAL PRICES AND POWER RATES

For many years, previous to the great war, the unit costs of different kinds of coal, like the unit costs of rail steel, were, as the laws of the Medes and Persians, fixed quantities or practically so. The variations in selling price were so small that they were neglected alike by power companies and public service commissions in matters of rate fixing and rate adjustment. But like about everything else this nice uniformity of price has been rudely upset by the war, for reasons only too obvious to the harassed purchasing agent. Since that portion of the cost of energy at the switchboard which is chargeable to fuel varies from 25 to 50 per cent, depending on size of plant, load factor, and location of plant with respect to source of fuel supply, the fuel question even in normal times is a most important one to those companies engaged in power generation. So far as the railway industry is concerned those companies engaged in power sales work are, of course, most directly affected by the fuel situation. A 50 per cent increase in fuel cost will, on the basis of the above figures, increase the cost of energy from 12 to 25 per cent; an increase sufficient to wipe out the margin of profit in most cases. The effect of high fuel cost on earnings has been forcefully pointed out in several recently issued annual reports of large power companies. As illustrative of the protective measures being used by some companies may be mentioned the power contracts of the New York Municipal Railway Corporation described in a recent issue of this paper. In these contracts the cost of power is made contingent on the cost of fuel. At present the outlook for a plentiful supply of cheap fuel is not very encouraging, and as rate increases and adjustments are both difficult and costly to secure, the fixing of a rate upon a base price for fuel and the inclusion of a contingent fuel cost clause in power rate schedules and contracts are wise precautions.

THE FINANCIAL VALUE OF MASTER MECHANICS

In recent editorials entitled "Better Pay for the Master Mechanic" and "The Master Mechanic's Corner" we have pointed out in general terms how undervalued that functionary is. Not long ago we were wired to recommend a master mechanic for a twenty-five car road at the dazzling wage of $100 a month. We used the mail to cool the fevered inquirer with the reply that $100 a month was now being spurned by most anybody who could detect the difference between a lathe and a boring mill.

From generalities on this subject, we may now pass to actual figures which show what a particular master mechanic may be worth. A certain man has been in charge of a property since 1911, and this is how he compares with his predecessor: The former man spent $28,650 per month to maintain cars which made 892,000 car-miles per month in 1910; the present man has successively lowered maintenance until it was only $14,000 per month in 1916 for 1,030,000 car-miles. If the 1910 rate per car-mile prevailed, the maintenance in 1916 would have been $19,063 more per month than it actually was—a tidy saving and all the more remarkable in view of the great increase in material costs from 1910 to 1916. Yet the cars look finer than ever, as indicated by an increase in painting (part of maintenance) from $750 to $1,625 a month.

Of course, this master mechanic has done more than save money on maintenance. He has reduced pull-ins to a minimum, thereby satisfying the riding public and giving his company 33 cents gross revenue for every extra car-mile due to uninterrupted service. Finally, in spite of extremely hilly conditions, he has produced a low-floor car that is promoting traffic and reducing platform accidents. We should say this master mechanic is worth about $50,000 a year more than the man he replaced. If not, why not?

THE PROSPECT FOR ADVANCEMENT IN A JOB

Having proved by actual figures that a good master mechanic is cheap at any reasonable price, we wish to call attention to another phase of the matter, namely that here as in all occupations it is the future rather than the present which concerns the ambitious employee. Preparation for the future consists in growing in the present job so that it is sooner or later outgrown. Only thus can the best present work be done, for the man who is not advancing is going backward. There is no such thing as standing still. It is, therefore, the duty of the electric railway industry to place before the men in the mechanical department, as elsewhere, sufficient of future promise to furnish the incentive for the best effort. The question may be asked "Why single out the mechanical department for comment, when the same principles apply elsewhere?" The answer is that in our opinion the mechanical department is peculiarly subject to limitations in pay and opportunity for various reasons, but whether this is so or not, it is obviously to the interest of every company first to get into the shops men who are capable of development, and then to furnish the stimulus for development.

But there is another side to this question. The mechanical department man who aspires to be a general manager must be thinking about transportation problems in a large way. The head of a technical department of an important electric railway system said recently to the writer: "I don't expect always to be only an engineer." He is presumably preparing himself for broader responsibilities by interesting himself in broader problems. So, in the shop, there are activities more important even than designing ingenious jigs for babbitting bearings or making pinion pullers from iron reclaimed from the scrap pile. The manager who is not delighted to see his equipment men show signs of administrative talent and broad-gage appreciation of the big problems of the industry is not the manager of the future. He and the head of his mechanical department should work hand-in-hand to solve these problems, and if they are so doing, the latter will not be looking for another job with more future in it.

DESTRUCTIVE POSTAGE TAXATION

One of the clauses in the pending war tax bill provides for a zone system of postage for second-class mail matter, with rates varying from 2 cents per pound for the first zone to 6 cents a pound for places in the eighth zone. The average rate for publications of general circulation, printed on the Atlantic seaboard, would be about 4 cents, as against 1 cent a pound at present.

We believe that all publications are anxious to pay their proportion of taxes to the government in the present emergency. This is certainly the attitude of the ELECTRIC RAILWAY JOURNAL. But the proposed rate is most objectionable from several points of view. In the first place it means so radical an increase in a very large item of publishing expense as seriously to affect the publishing industry, since all existing subscriptions and advertising rates are naturally based on the present charge. The net result will probably be periodicals so crippled that there would be little if any increase in gross or net postage income to the government, as most of the post-office department expenses would go on as heretofore. It would mean also that the government was reducing the best facilities at its disposal for instructing the various industries of the steps they should take to assist in the national defense.

A second objection to the plan as proposed is that it tends to sectionalize the country at a time when national unity in thought and action is most important. Moreover, in the case of technical and trade papers, it would penalize those subscribers most distant from the centers of publication by making it more expensive for them to keep in touch with the economic developments in their line of business. The increase in postage on a year's subscription to this paper in the eighth zone, for instance, would be approximately $2.25, the eighth zone including all points 1800 miles or more from New York. The zone system for second-class postage has been suggested before but always has been discarded, and it always should be discarded in the interests of nationality and also because it is based on the wrong theory that the largest item in the cost of the mail service is the railroad transportation instead of the terminal charges of sorting and distribution.

In the third place, the proposed increase runs counter to the plan that the expenses of the war should be paid for out of profits and not out of capital. Howard E. Coffin, of the Council of National Defense, recently said, and truly, "We must have successful industries, if successful tax levies are to be received." But a high tax on methods of production of trade and technical papers will not only prevent the publishers of those papers from having profits on which to be taxed, but, through the reduced service which they will be forced to render, will adversely affect the industries which they serve. Subscribers to this paper can well make their protest heard in Washington.

NEW ERA FOR ELECTRIC RAILWAY INDUSTRY

The electric railways of New York State have at last taken the plunge magnificent. They have determined to cast aside all minor misgivings and to present themselves unreservedly at the bar of public opinion. Some of the companies have been timid about this, others, acquiescent; others, hopeful; and others, confident. We ourselves are absolutely sure that the companies have done a wise thing and that the issue will justify their wisdom.

The profoundly sagacious feature of the proposed policy is to go first directly to the people. As was stated specifically by Mr. Shonts in his published statement to the people of New York this week, it is the purpose of the company to go formally before the Public Service Commission later on for consideration of the situation, but preliminary to. that it is the company's purpose to "inform and consult public opinion." That is fine. Mr. Shonts addressed a letter to the presidents of the principal commercial and taxpayers' organizations in the city of New York inviting them to examine into the facts for themselves and report their conclusions to their own members, and through them to the public. This will make possible an organized and spontaneous development of public opinion in advance of definite consideration of the subject by the Public Service Commission itself.

The committees representing the electric railways of the State have had conferences with the Public Service Commissions in both districts of New York with a view to settling upon a procedure whereby the issue may be presented definitely and determined upon as speedily as possible. But we understand it is the purpose of all these companies to invite investigation and consideration by local organs of public opinion in order that the people themselves may determine whether or not relief for these companies is not justified, not alone from the point of view of fairness to investors but from the point of view of the interests of the public service itself.

The people must realize that they must provide their street railways not only with sufficient money merely to keep alive but to enable them to keep up with the progress of the art. Street railways have gone through a process of evolution. First, there was the horse car, then, the cable lines, the overhead trolley and the underground trolley. The types of cars are undergoing evolution, always toward greater comfort and convenience for the public. This progress of the art must be paid for; it must be provided for out of the earnings of the company. That is true of companies which are not extending their service. Of course, those that are building new lines in new districts must have the new capital with which to do so. Otherwise the public is sure to suffer. These facts should be made clear in every community where electric railways operate.

As was stated by J. K. Choate, chairman of the committee of the New York Association on ways and means to increase revenues, the method of obtaining the additional money will have to be according to local needs. In New York City, for example, the network of lines makes the obvious solution of the problem a charge for transfers. The lines up-State, however, will probably have to get their relief, if they obtain any real relief at all, from a 6 or 7-cent fare. Buffalo very likely will have to deal with the problem much as New York does. But the essential need is to obtain more money, and the safe and only road toward doing that is through persuading the public as to the reasonableness of the policy proposed.

VALUATION DELAY DANGEROUS

Companies should make it clear to their constituencies that a solution of this reserve problem cannot be delayed while a process of "valuation" is gone through with the properties. Valuations are all very well, but the vital question now is whether or not the value of the service rendered is not greater than the cost of rendering service. In the steam railroad business it is a fundamental principle, justified by long years of experience, that the service should be paid for with some regard to its value. Perhaps the stock of some of the companies is "watered"; perhaps there have been unsound methods in their past finance. But this is the fact which the public faces now: *its present standard of service is threatened.* Will the danger to that service be averted now by a slight increase in fares or forcing the companies into receivers' hands, or so close to receiverships that the standard of service will necessarily suffer? That is the phase of the matter which should be presented to the public in a practical and very present form.

The new federal tariff bill expects to raise the rate on ordinary letter postage from 2 to 3 cents. Nothing could be more revolutionary than that. It is justified by the expenses to which the government has been put under the necessities of war. The expenses of the government are directly related to the war. But the public should face the fact very clearly that the vastly increased expense to which street railways as well as other lines of business have been put is due just as much to the war as are the expenses of the government, the only difference being that the effect upon the street railways is indirect while that upon the government is direct. For example, the reason why the price of coal is so high is because there has been such an enormous demand for coal in Europe, because there has been such a great development of industry in this country to supply the needs of Europe for supplies of all kinds and because there is a shortage of labor in the coal mines. The price of coal has got beyond all bounds and affects the street railways very directly. When the electric railway companies, therefore, pay the very high price of coal they are, in a sense, paying the expenses of the war just as much as the government which directly buys munitions to ship to the front.

PUBLIC WANTS TO BE FAIR

This question of raising the basic fare, so long discussed and from which electric railway men have recoiled as from a threatening serpent, is now at last definitely before the people. We are more than delighted that it is to be presented to the people, and that the people themselves are to be requested to express their views for the purpose of guiding the action of the public service commissions. Obviously, if the people feel it to be right and wish to pay an increased fare to ride on their street railways, no public service commission in the world would attempt to deny them that privilege. On the other hand, public service commissions could not be expected to face the storm of public protest and criticism and award to companies the right to charge an increased fare, if the public itself felt that the increase was unreasonable and unwarranted.

We have the utmost confidence in the American people. We have never known any subject to be presented to them and fully discussed by them but, in the end, it was settled fairly and squarely. The people will not submit to be humbugged; they will not submit to have something put over them. But they do want to be fair and square, and we are certain they will be so in this case. The electric railway industry is to be congratulated and felicitated upon the way in which it has gone at this matter, and we have every confidence in predicting the result will be a triumphant vindication of the methods which are being pursued. The electric railway industry through this action of the companies in New York, has, we believe, entered upon a new era.

"THE manufacturer can raise his price to keep pace with his costs. It is what every private enterprise has been doing. Every item that enters into the cost of living is increasing. Street railway costs are mounting in a faster ratio than any other, yet our prices have been kept at the same level."—J. K. CHOATE, *before the New York Public Service Commission, Second District, May* 16, 1917.

Interurban Cars with Off-Set Central Vestibules

The Jamestown, Westfield & Northwestern Railroad Has Placed in Service Some High-Speed Cars Having Central Entrance Vestibules to Separate Passenger and Smoking Compartments—Split-Field Motors and Multiple-Unit Control Are Used to Save Weight

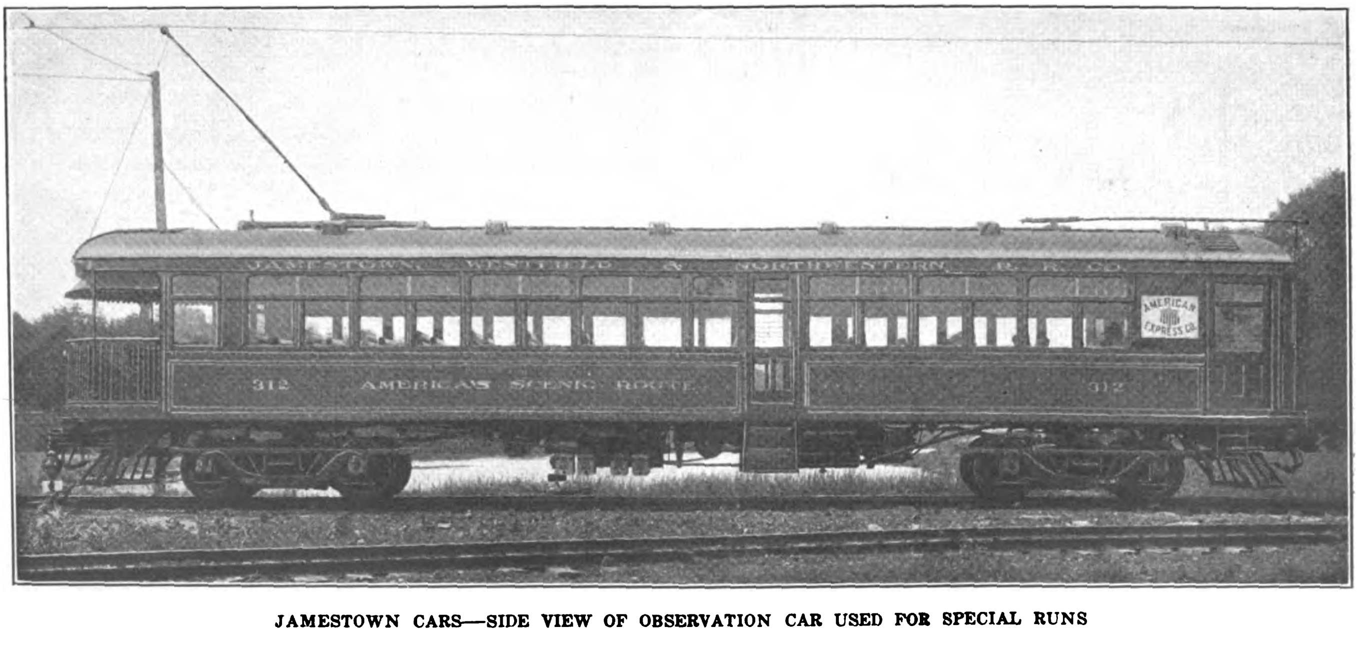
FOUR high-speed interurban cars have been placed in service by the Jamestown, Westfield & Northwestern Railroad that possess several notable features, among which the most prominent is the provision of offset central vestibules 3 ft. wide without the use of drop-siding to support the steps. Primarily the centrally located entrances were adopted to separate definitely the smoking and main passenger compartments, thus avoiding any need for women passengers to go through the section occupied by smokers—an undesirable condition that of late is being given continually increasing recognition. Another feature appears in the facilities provided for giving passengers an unrestricted view of passing scenery by the installation of glass in all bulkheads and even at the rear of the motormen's cabs.

The traffic that is served by the cars is very largely made up of through travel from Jamestown, N. Y., to connect with the trunk line of the New York Central Railroad, the schedule time for limited runs over the 32-mile route being fifty-nine minutes while the local schedule calls for one hour and fourteen minutes. Relatively few stops are made, and hence the objectionable features of the single narrow vestibule, whereby complete unloading must take place before passengers can board the car, are minimized in effect. On the other hand, the design permits the seating capacity of the cars to be materially increased, and this feature is considered by G. L. Maltby, superintendent Jamestown, Westfield & Northwestern Railroad, who designed the cars, to be of utmost importance, since the major part of the company's traffic comes within a period of only three months and all equipment must be worked to the limit of its effectiveness. The gap in the car side necessitated by the interior-type steps has been introduced without the need for drop siding by cutting out a section of the side sills and transferring the load normally carried by it to a pair of heavily reinforced intermediate sills.

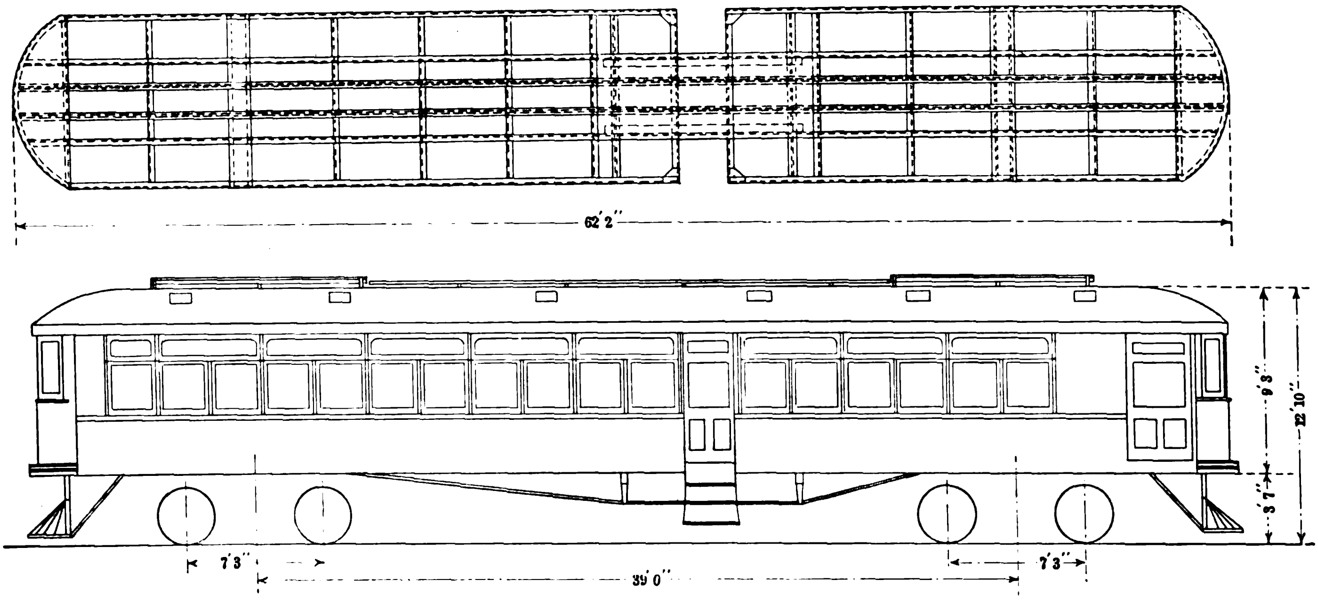
Another feature of the cars is the use of Westinghouse 547-A motors with "split" fields. This design was adopted in spite of the infrequent stops on the schedule with the idea of saving in motor size and weight, the motors actually installed having an hourly capacity of about 85 hp., whereas straight series motors to maintain the schedule over the rolling country served by the road would have had to be of about 105 hp. rating. At full speed on level track the motor equipment gives a speed of 50 m.p.h. and it will give greatly increased torque at a speed of 42 m.p.h. when operated on the next lower running point. Indirect control also was adopted to save weight and to keep all of the heavy current-breaking apparatus below the car floor.

One of the cars has been provided with an observation platform that can be paneled in during cold weather. This car was designed especially for a limited run that makes connection with a favorite train on the New York Central Railroad. Owing to the absence of readily accessible wyes at the terminals, and the necessity for operating this car single end, it is not used on other runs, and therefore has been provided with a more elaborate interior finish than the three other cars. Aside from this feature, however, all four cars are exactly alike, being provided with baggage compartments at one end, in addition to the main passenger and smoking compartments, to serve the needs of the many traveling salesmen who patronize the line.

The most interesting feature of the construction is


JAMESTOWN WESTFIELD & NORTHWESTERN R. R. CO.
312 AMERICA'S SCENIC ROUTE 312
AMERICAN EXPRESS CO.

JAMESTOWN CARS—SIDE VIEW OF OBSERVATION CAR USED FOR SPECIAL RUNS

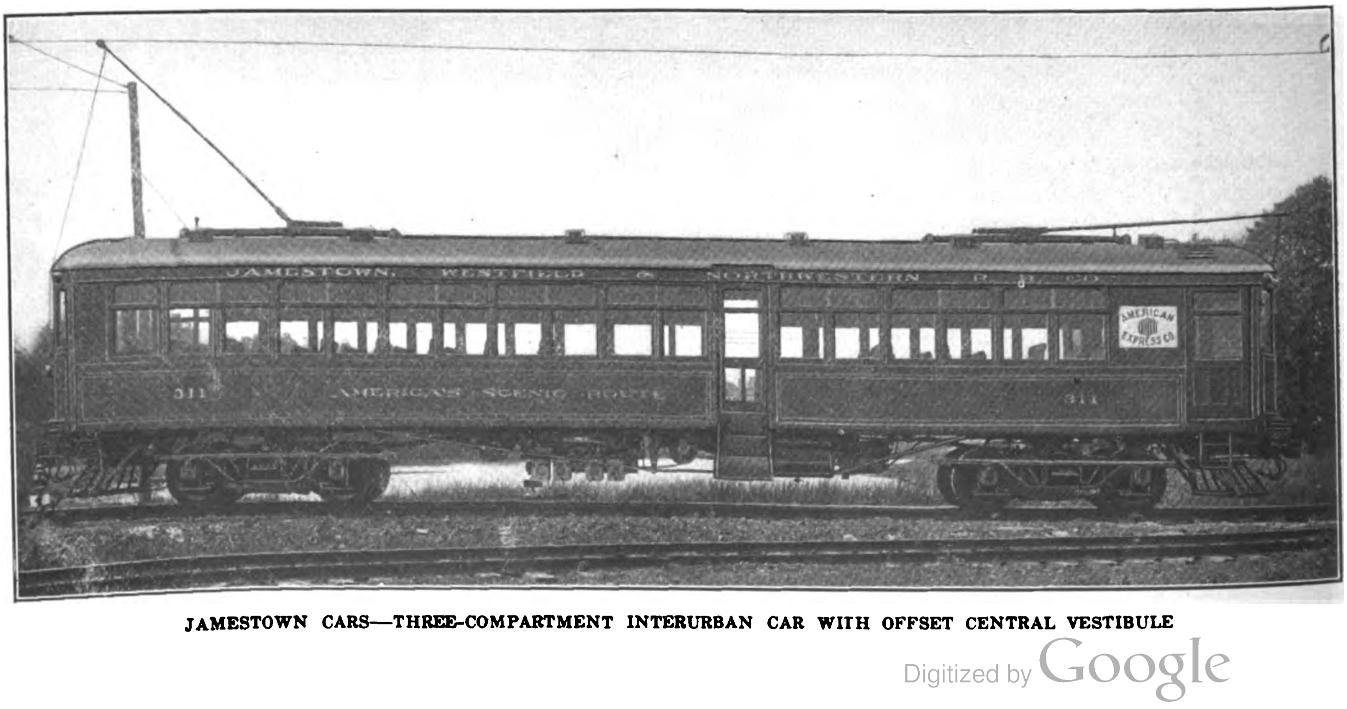


JAMESTOWN CARS—ELEVATION AND FLOOR-FRAMING PLAN OF INTERURBAN CAR

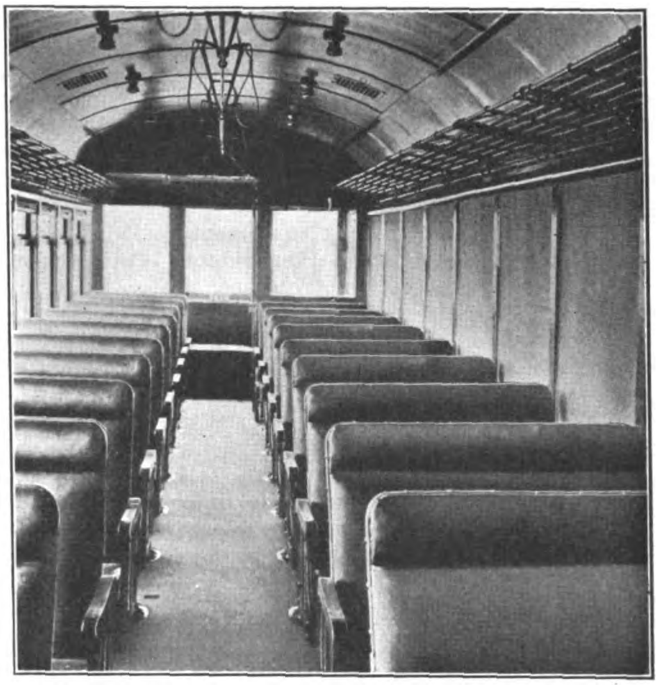
the framing arrangement at the gap in the side necessitated by the centrally located entrance. Strength at this point is provided by the use of intermediate sills made from 8-in., 11-lb. channels that are reinforced at the vestibule by having lengths of 8-in. channel riveted back to back with the intermediate sills and extending for the length between needle beams about 9 ft. In addition, the intermediate sills are trussed with 1¾-in. truss rods having a 24-in. drop. The needle beams are of 8-in., 18-lb. channels, and they serve to distribute part of the load between the intermediate sills and the side sills, which are 6-in., 8-lb. channel with the flanges turned inward. Step sills at the sides of the vestibule also extend across the car, these being made from 8-in., 11-lb. channels. The center sills are made of 8-in., 18-lb. I-beams, and they have cover plates 54 in. wide extending in one length from one needle beam to the other, the thickness being ⅛ in.

Aside from the construction at this point, the design is not unusual, following the general practice of the St. Louis Car Company, the builder of the car bodies. The side sheathing is made from 36-in. x ⅛-in. steel with a 3-in. x ⅜-in. belt rail at the top, over which is a belt-rail cover and sash rest of ⅛-in. pressing. The side posts are made from 2-in. x 3-in. tees extending from side sill to side sill in one piece and forming the carlines. The end posts are 2½-in. x 3-in. tees, while the corner posts, baggage door posts, motorman's door post and vestibule door post are of ash. To serve in place of crown pieces, and to keep the sills from relative longitudinal movement, a steel plate ⅛ in. thick is riveted to the flanges of the bumpers and sills and extends for 30 in. back from each end of the car, the bumpers being 8-in. channels with the flanges turned inward. The body bolster is of the built-up type, and there are bolster cross sills of 8-in. channel on either side of it. Plates of 3-in. x 2-in. x ¼-in. angle are provided near the eaves, and there is a letterboard of No. 14 sheet steel. The interior finish is of wood, but there is a layer of insulating material composed of ½-in. flaxlinum cemented to the inside of the side sheathing.

The flooring rests upon cross sills of 5-in. channel spaced about 4 ft. 6 in. apart, and it is built up of a course of No. 16 sheet steel that covers the entire bottom, together with ¾-in. fillers bolted to sills and floor sheets, one course of building paper, one course of 13/16-in. flat grain yellow pine tongued-and-grooved floor board, and one course of battleship linoleum. In



JAMESTOWN CARS—THREE-COMPARTMENT INTERURBAN CAR WITH OFFSET CENTRAL VESTIBULE



JAMESTOWN CARS—INTERIOR VIEW OF PASSENGER COMPARTMENT, SHOWING FULLY GLAZED MOTORMAN'S COMPARTMENT IN RIGHT-HAND CORNER

the baggage room the floor is made of ⅛-in. diamond-pattern steel riveted to the tops of the sills, an insulation of 1-in. mineral wool being provided between the floor plate and a No. 16 sheet steel subfloor, which is set 1 in. below the top of the sills.

The roof is covered with 7/16-in. narrow-width, tongued-and-grooved poplar that is fastened to furring strips on the carlines. This surface in turn is covered with No. 8 cotton duck fastened with molding at the eaves. Galvanized-iron gutters are installed on the roof over the center-entrance doors and over the motorman's door.

At the center doors the steps are of steel and the treads are installed so that there is an opening of 1 in. between the riser and the back edge of the tread, both step treads and edges of vestibule floor being fitted with Mason safety treads 6 in. wide. At the motorman's side door and at the baggage door on the opposite side of the car folding steps are installed to give access to the roof. The usual wrought-iron sill steps are installed at the baggage doors and at the motorman's cab door.

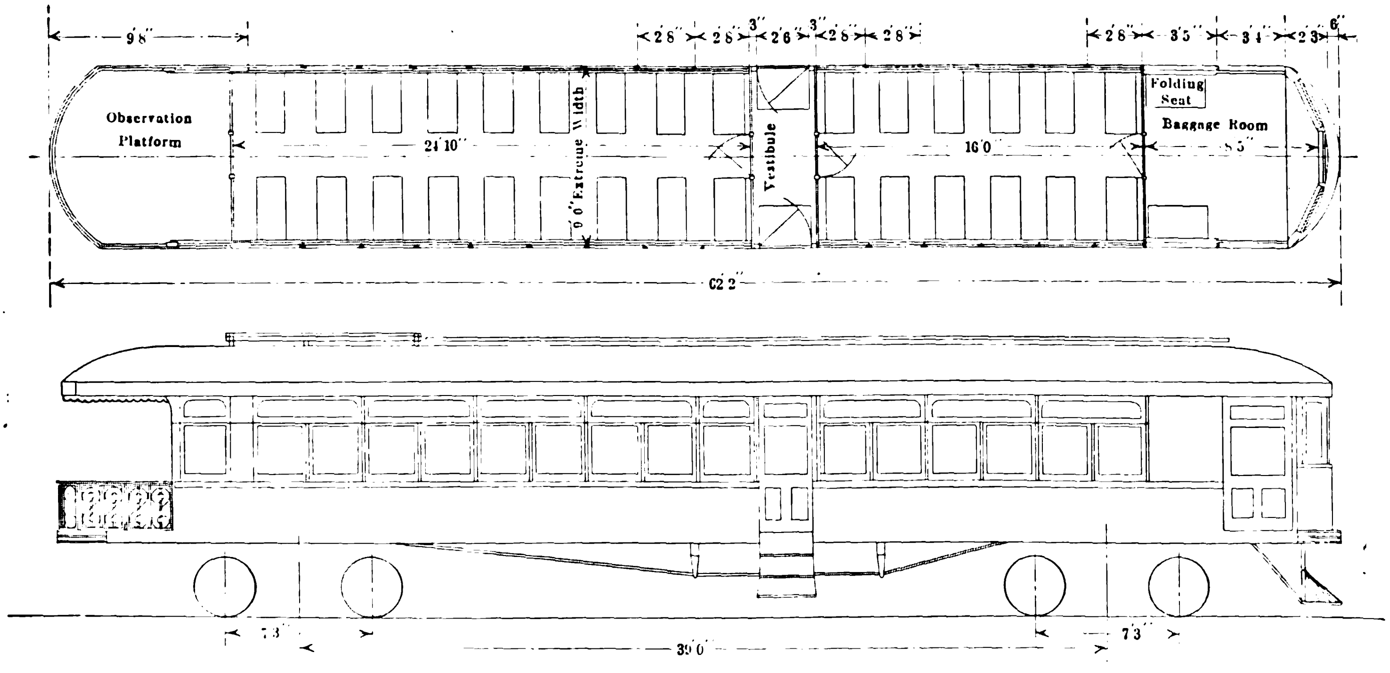
The general dimensions and weights for the car are as follows:

Length over bumpers	62 ft. 2 in.
Length of baggage compartment	9 ft.
Length of smoking compartment	15 ft. 11 in.
Length of main passenger compartment	33 ft. 5 in.
Length of central vestibule	3 ft.
Side post centers	2 ft. 8 in.
Extreme width	9 ft.
Length between truck centers	39 ft.
Truck wheelbase	7 ft. 3 in.
Weight of car body	43,420 lb.
Weight of trucks	28,000 lb.
Weight of electrical equipment	14,625 lb.
Weight of air brakes	2,355 lb.
Total weight complete	88,400 lb.

INTERIOR ARRANGEMENT AND EQUIPMENT

An unusually broad seat is provided, since the width of aisle is 22 in. and the over-all width of the car 9 ft. The seats are of the reversible type in both the standard type cars and the observation car, excepting, of course, the stationary seats at the ends of both compartments and two folding seats that are located in the baggage compartment. The latter compartment serves to separate the motorman from the body of the car and no cab is provided at that end. On the three standard type cars, however, a cab is installed at the opposite end of the car in the main passenger compartment, since these three cars normally operate in both directions. The cab, it may be said, is provided with glazed doors, giving entrance into the passenger compartment and also to the outside of the car, and it has a large stationary sash in the back wall, permitting a full view ahead by passengers in the compartment behind the cab.

As before mentioned, the vestibule is 3 ft. in length and extends across the entire width of the car, being provided with trapdoors and steps at both sides. The bulkheads on either side of the vestibule are made of mahogany 1⅛ in. thick, with flush panels, and they are provided with single swinging doors and with glazed stationary sash on either side of the swinging doors. The same provision for observation in every direction



JAMESTOWN CARS—ELEVATION AND SEATING PLAN OF OBSERVATION CAR by passengers appears in the use of glazed sash in the bulkhead for the baggage compartment.

Including the folding seats in the baggage room, the interurban car seats seventy-two passengers, while the observation car seats sixty-four. However, the latter figure does not include any allowance for space on the observation platform, upon which folding chairs are used.

Features of the interior equipment include the use of electric heaters with Consolidated Car Heating Company's thermostat control, one heater being installed under each cross seat. Ventilation is provided through twelve Peerless ventilators installed on the roof of the car and equipped with round brass registers in the headlining, which is ¼-in. Neva-Split.

A mahogany interior finish is used in the passenger, smoking and vestibule compartments, including all sash, doors, moldings, sash rests, frieze boards, etc. In the baggage compartment the finish is of natural ash. The seat coverings are of black leather on the standard cars and green leather on the observation car, all curtains being made of Pantasote. For the wainscoting a finish of ¼-in. Neva-Split extends from the seat-rest angle to the sash rest. Below the seat-rest angle, the finish is of No. 16 steel, and a 3-in. radius sanitary cove is provided at the floor line.

ELECTRICAL AND MECHANICAL EQUIPMENT

Each car, as mentioned before, is equipped with a quadruple equipment of Westinghouse No. 547-A, 600-volt, field-control motors and standard Westinghouse HL-type control. The motors have a nominal or one-hour rating of 118 amp. at 600 volts, approximating 85 hp., the continuous rating being 72 amp. at 600 volts. This motor was designed to meet the previously outlined service requirements of sustained speed over rolling country with relatively few stops, such as exist on the Jamestown, Westfield & Northwestern Railroad, and the weight of the motor complete is only 3100 lb.

The main field coils are wound in accordance with what the manufacturer terms the "split-field" arrangement. In effect this provides for two field windings per pole, both of which are connected in series during acceleration. As a result there is provided the highest possible tractive effort and low-current consumption at low speed, with a consequent economy in operation and freedom from high peaks in the load. When a portion of the field winding is cut out, the characteristics of the motor are modified just as if the gear ratio had been instantaneously changed.

The use of an indirect type of control was practically inevitable, because of the fact that the present-day forms of such apparatus have demonstrated themselves to be of far greater reliability and of very nearly equal simplicity to controllers of the platform type. In addition, the removal of apparatus carrying heavy currents from the platform, as well as the possibility of train operation, made its use of decided importance for the installation under discussion.

Westinghouse air brakes of the AMM type have been installed, this design providing for quick-service application, graduated release and high pressure in emergency, with the addition of the independent use of the straight-air feature for single-car operation. The control, however, is contained wholly within one brake valve and the car is ready at all times for either single-car or train service. The body brakes are designed to give a braking power of 90 per cent of the light weight of the car.

Other equipment that is installed includes Tomlinson M.C.B. couplers as well as the railway company's standard portable drawbars. The headlights are of the Crouse-Hinds luminous-arc type, arranged for removal from one end of the car to the other. A switchboard is located in a small steel switch cabinet in the baggage room, this being of such size that it accommodates all switches except those for the headlights and air compressor. The latter switches are located on the ceiling in a position convenient to the motorman. The fare register is of the International double-faced round type, designed for recording cash and ticket fares.

The cars are mounted on Baldwin high-speed interurban trucks with a wheelbase of 87 in. and a carrying capacity of 35,000 lb. on each center plate. They are of the equalized, pedestal type, with forged side frames, angle-iron end frames and channel transoms that are reinforced with substantial corner gussets, the latter acting at the transom as guides for the brake levers. The objectionable nosing so often found in high-speed service has been reduced to a minimum by a special arrangement of short and long swing links recently developed by the builders. Throughout the foundation brake rigging on the trucks has been bushed with case-hardened bushings and fitted with case-hardened bolts, spring washers and castellated nuts, making the brake practically noiseless in operation and providing means for economical replacement of parts that have been affected by wear. The trucks are provided with 36-in. wheels, 5-in. x 9-in. journals, cast-steel bolsters, and inside-hung motors and brakes.

P. S. R. A. Discusses War Problems and Increased Fares

Spring Meeting Was Devoted to Informal Talks—Important Resolutions and an Amendment to the Constitution to Provide for Holding but One Meeting Annually Were Passed

ABOUT sixty members attended the spring meeting of the Pennsylvania Street Railway Association held at the Harrisburg (Pa.) Club on May 11. On account of the present national crisis the usual set program with prepared papers was replaced by an informal discussion covering the two general subjects: first, war-time duties of electric railways including the economies and precautions which are advisable, and, second, increased fares. The war subject formed the morning topic of discussion, luncheon was served at 2 p. m., and then after talking over war-time economies and labor problems the question of increased fares was discussed until the meeting adjourned at 5.30 p. m.

E. B. Burritt, representing the American Association, was present at the meeting. He included in his remarks a brief description of the way in which the American Association was co-operating with the national government by collecting data regarding electric railways and maps of their lines.

RESOLUTIONS PASSED BY THE ASSOCIATION

The association took formal action on several matters. The amendment to the constitution presented at the Philadelphia meeting was carried. This provides that the regular meeting of the association shall be held annually during the month of May or June at such time and place as may be determined by the executive committee. The action taken at the last meeting of the executive committee, offering the services of the Pennsylvania Street Railway Association in co-operating with the Council of National Defense in the present national crisis was approved. It was voted to send telegrams to the Pennsylvania congressmen and senators in the national Legislature, and to the members of the ways and means committee of the House and the finance committee of the Senate, urging that motor trucks and buses doing a passenger or freight business be included in the same schedule of taxation as the steam and electric lines. In connection with the subject of increased fares a motion was made and carried that a committee of five be appointed to take up the question of increased fares on the street railway lines of Pennsylvania. It was understood that this committee would investigate the desirability of the railways taking united action before the Public Service Commission on this subject. Letters will probably be sent out by the secretary of the association to member companies asking their opinion on this subject, and when the committee has crystallized the ideas of the railways a special meeting of the executives of the member companies may be called to authorize further action.

WAR NECESSITATES GUARDING OF PROPERTY

On the subject of the special war-time precautions different members told of what their railways had done. The precautions consisted chiefly in guarding the company's property by special constables and deputy sheriffs; placing barbed wire fencing around the power houses, carhouses and shops, and reducing the number of entrances to such property; screening of powerhouse and shop windows; using additional tie lines between power stations, and in other ways providing for an emergency source of power. The companies operating through several counties told of the difficulty encountered because of the fact that the deputy sheriffs and constables could have jurisdiction only in one county. Another disadvantage of having this class of guards was that they were sworn in by the sheriff, who was responsible for any overt act which they might commit. When the guards were used on railways the sheriff held the railway responsible. The law provides that the guards cannot use their guns except in cases where their life is in danger or where the trespasser is detected in committing a felony. It was pointed out that it was therefore necessary to give careful instructions to the guards as to the handling of their firearms. The use of shotguns instead of rifles was recommended because of the fact that the bullets do not carry as far and the danger in hitting innocent persons is not so great. The companies reported that the government was not furnishing the electric railways with any guards. This left it up to the railways to furnish their own men for this duty. It was pointed out that Germany has not yet recognized a state of war with the United States, and when she does so the number of acts against the public utilities may be greatly increased. The railways should, therefore, be continually on their guard and not be careless because no acts against their property have been committed so far.

PAY FOR EMPLOYEES IN MILITARY SERVICE

It was reported that the United States Chamber of Commerce had investigated the subject as to whether or not the employers should pay the wages of the men who enlisted and take care of the dependents at home. The decision was that the government and not the employers should bear this burden. Instances were cited in which the railways were paying full wages of the men and promising to give them their jobs when they return. One of the embarrassments of the latter promise was that several men might hold the same position successively before leaving for the front. The question of who should receive the position at the end of the war would be a difficult one to solve.

One railway man read the following announcement as a tentative definition of the company's war-time policy:

"The folly of crippling local transportation facilities of the country by general and indiscriminate enlistment of employees engaged in this service is recognized by the government and the public.

"The company will discourage no man who feels it his duty to enlist, but it is believed that unless and until the need for their enlistment becomes greater than the importance of maintaining adequate street car service in the community, its employees, especially married men with dependents, will best serve the needs of the hour by continuing in their present employment and assisting in maintaining the best possible street car transportation. Under an order of the military authorities married men with dependents are not at this time subject to government service.

"No man will lose his seniority standing because of his enlistment, and so far as it is possible to do so, men who enlist will upon their discharge from government service be reinstated in the company's employ at the rate of pay and in the position as nearly equal to that held by them when they enlist as conditions at the time of their return will permit.

"Members of the co-operative beneficial association who enlist and continue the payment of their dues while in the government service will be entitled to the death benefit of $150 payable to their beneficiaries and to the prescribed sick benefits, providing they are not drawing their government pay during disability.

"Men who enlist will not thereby forfeit any right they may have at the time of their enlistment to benefits under and subject to the terms of the company's insurance and pension plan."

EMPLOYMENT OF WOMEN CONDUCTORS PRACTICABLE

The use of women conductors was generally considered to be practicable but not necessary for some time to come. One company reported it had fourteen applications on file from women who wanted such jobs. It was thought that the motormen would favor rather than object to the use of women conductors on their cars, and it was pointed out that extensive additional comfort facilities would have to be provided for them in the carhouses and employees' quarters.

In connection with the shortage of men in both the transportation and mechanical departments, it was believed the raising of wages was no longer an adequate means of holding the men, and that the government would soon have to take a hand in the labor problem and regulate it in some way.

INCREASED FARES ADVOCATED

The question of fare increases was the last one to be taken up. A rising vote showed that the majority of the members were interested in fare increases as a practical proposition on their own railways. Raising interurban fares to 2 cents per mile, reducing transfer privileges, charging for transfers and cutting out reduced-rate tickets were suggested as steps to be taken before asking for a 6-cent fare. It was generally believed that this was the most opportune time to obtain a fare increase, and as already reported it was decided to have a committee of five investigate this subject further in order that the railways could take united action on it.

According to John P. Dohoney, investigator of accidents for the Public Service Commission of Pennsylvania, 187 persons were killed in 1916 on the street railways of that State, as compared with 173 in 1915, and 3295 injured in 1916, as compared with 2495 in 1915. There was an increase of 32 per cent in the number of accidents on the street railways, the total number for 1916 being 2580 and in 1915, 2062.

N. E. L. A. Committees Summarize Technical Progress

The Reports Which Were Presented by Title at the New York Meeting of the National Electric Light Association Last Week Contain the Results of Investigations in Power Generation and Distribution—They Show Considerable Activity in 1916

As was reported briefly in the issue of the ELECTRIC RAILWAY JOURNAL for May 12, the annual meeting of the National Electric Light Association was held in New York City on May 9 and 10. Among the reports presented by title but not discussed were several relating to power plant and line matters which are abstracted below.

A TREATISE ON PRIME MOVERS

The report of the committee on prime movers was contained in a 164-page pamphlet. It covered all phases of the subject and contained summaries and opinions from manufacturers and engineers on their respective specialties.

It appears that 1916 was a big year in steam turbine business. The Westinghouse Electric & Manufacturing Company sold one 70,000-kw. unit for 300 lb. per square inch pressure and 150 to 200 deg. superheat. This company is supplying other machines for equally high pressure and 200 to 250 deg. superheat. It sees no objections, from the standpoint of the turbine designer, to initial temperatures up to 650 or 700 deg. At present 76 per cent of the energy theoretically obtainable from steam expansion can be realized at the switchboard and further progress must come from the use of higher pressure. During the year the General Electric Company took orders for three times as much turbine business as was secured in any previous year. The average size of the machines was about 50 per cent greater than heretofore.

CONDENSER SIZES INCREASING ALSO

The Westinghouse Company also noted a demand for increased condensing surface in a single unit from 56,000 sq. ft., in one designed to serve a 35,000-kw. turbine, to 100,000 sq. ft. in one to operate in connection with a 60,000 to 70,000-kw., three-element turbine. The jet condenser record, made last year in an order for a 45,000-kw. turbine, has not since been broken, but there has been a considerable demand for jet condensers to serve turbines of about one-half this capacity. This company's aggregate business in surface condensers increased almost 450 per cent over the preceding year, the average large condensing equipment was 65 per cent bigger, and the average weight of condenser shells which the foundry and shop were called upon to handle increased by 55 per cent.

From this company's experience barometric condensers are gradually losing favor, not more than 5 per cent of jet condenser jobs recently having demanded this type. The low-level jet condenser almost invariably works out to be most economical except when water-level conditions are such that no circulating pump would be required for the barometric condenser, or in a few cases where the water available for cooling purposes is exceedingly bad. A most significant feature in the report of the Wheeler Condenser & Engineering Company was the increasing demand for the turbo air pump as compared with dry vacuum pumps. Dry vacuum pumps are preferred by many engineers but meet with objection very often on account of the space required. The turbo air pump is admirably suited for large capacity with small space occupied. In a number of instances a single large-capacity air pump has been used with a large condenser, and designs are now available for as high as 50,000-kw. capacity in one pump.

The Wheeler Company also noted a constant increase in the number of condensing plants using artificially recooled water, having built during the year 1916 what is probably the largest single tower in existence, one having a capacity of approximately 7500 gal. per minute. It also reported that many aspects of the problems connected with the corrosion of condenser tubes continue to baffle the ablest engineers and metallurgists, and the matter is subject to world-wide investigation.

GEARED AUXILIARIES BECOMING POPULAR

The Westinghouse Company reported increasing success in geared turbo exciters which are now built in units of capacity up to 1000 kw. Large machines like these supply not only excitation requirements but also direct-current loads in the vicinity of the power house. The prediction was made that the next few years will see the elimination of direct-connected turbine-driven pumps, blowers and generators, due to the prestige which the geared turbine enjoys. Even now orders entered for geared and direct-connected turbines are in the ratio of three to one in favor of gears.

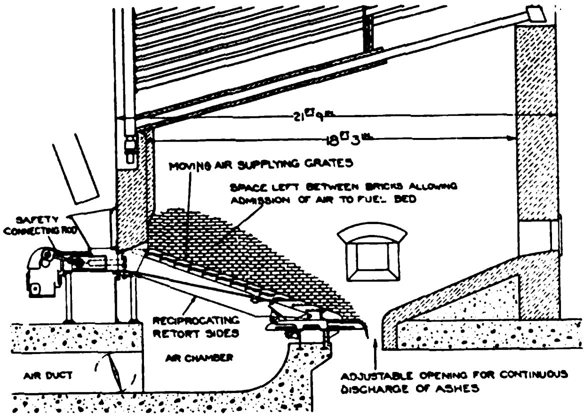
STOKERS AND FURNACES

The section of the report on stokers showed that this feature of the power plant is developing rapidly. The American Engineering Company, which makes the Taylor underfeed stokers, stated that the power-operated dump grate is largely employed on all types of its stokers, the latest type of stoker being one which employs these dumps and large retorts with triple pushers. In very large power houses stokers equipped with the automatic rotary ash discharge are being installed. Tests made with different types of this company's stokers on a 625-hp. B. & W. boiler showed all to give to a maximum furnace efficiency of about 80 per cent with from 350 to 450 lb. of coal burned per retort per hour. At heavier loads the triple-pusher stoker with the power-operated dump is the best. The large stokers operate at the same rate of fuel burning as the smaller with a much lower air pressure and consequently a smaller amount of power is required in the auxiliaries.

In comparing the rotary ash discharge with the power dump, it was noted that the former is designed to handle cold ashes, hence it is not always possible to provide the large amount of space necessary for cooling the brick wall and ashes. Where it can be used, however, it produces high efficiency which can be maintained for many consecutive hours when once a correct operating condition has been obtained. There is also less combustible in the ash. The power dump is preferable in power houses in which the boilers are banked for long periods, hence dead ashes and refuse must be cleaned out quickly.

The development work which had been done by the Westinghouse company during 1916 was mainly in adapting the underfeed stoker to high-ash Middle Western coals and lignite. To take care of the large amount of refuse with such coals the double-dump grate has been used with a complete success. Air can be admitted on both the front and rear dumps, and unconsumed carbon deposited thereon with the ash can be burned out before dumping. The rear dump alone can be used for dumping refuse, or both dumps can be used at the same time. This company reported a tendency especially in large plants to increase the size of individual boiler units, stating that boilers of 1000 hp. and more are rapidly becoming standard. These are characterized by simplicity of boiler setting, tending to eliminate brickwork troubles.

The Sanford-Riley Stoker Company called attention to the operating difficulties which have been experienced during 1916 on account of the scarcity of reliable labor. This company humorously remarked: "We have learned of a few new ways to neglect and abuse stokers, but the favorite abuse still remains in the ash pit." The best protection against such abuse is said to be a large easily cleaned ash pit. This company directed attention to an increase in combustion efficiency to be obtained by feeding fuel slowly through the retorts and by providing for large volumes of coal in the furnace. This may be accomplished by installing stokers back to back in a duplex setting, or by making the retorts extra large. In one plant installed by this company each 1140-hp. boiler was equipped with two 15-retort stokers set back to back, giving a total grate area of 417.8 sq. ft., and a ratio between grate area and water-heating surface of 1 to 27.3. There are about twenty tons of coal and coke in the furnace at all times.


21′ 9″
18′ 3″
MOVING AIR SUPPLYING GRATES
SPACE LEFT BETWEEN BRICKS ALLOWING ADMISSION OF AIR TO FUEL BED
SAFETY CONNECTING ROD
RECIPROCATING RETORT SIDES
AIR CHAMBER
AIR DUCT
ADJUSTABLE OPENING FOR CONTINUOUS DISCHARGE OF ASHES

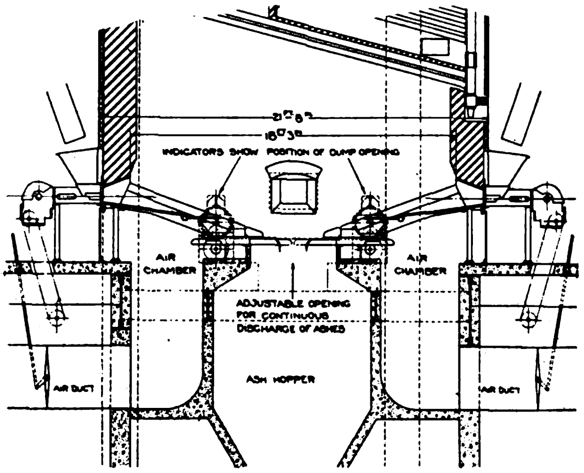
STOKER WITH EXTRA LARGE RETORTS

Another important development pointed out by the Riley company was in the use of ventilated side-wall construction, such as that developed at the South Boston plant of the Boston Elevated Railway. The admission of air along the side walls by one means or another preserves the brickwork and prevents the adherence of clinkers. The combustion seems to be induced on the surface exposed to the fuel, while the brickwork is cooled by the air, the combustion at this point resulting in ashes rather than clinkers. The temperature is kept high so that there is no adherence of clinkers to the brick, and no objectionable effect is noted in the fuel beds.

Better Furnace Linings Are Needed

In summarizing the situation regarding refractory material the committee pointed out that the use of large boilers, with large combustion chambers and furnaces, has resulted in more frequent failures in the arches and side walls. This is due to the increase in firebrick surfaces and the expansion and contraction strains caused by the higher temperatures. Experiments in bracing the flat walls have not been very successful.

Further development is also needed in the refractory firebrick used for furnace lining. Variation of the composition of the clay, the method of manufacture and the heat treatment of the brick all have their effect on the final product, and it is necessary to select the brick with great care. A test is being made at present at the Fifty-ninth Street station of the Interborough Rapid Transit Company of New York City on a type of brick known as "Metalkase," designed to eliminate the adhesion and penetration of slag or clinker. A run completed last November was said to have shown satisfactory results. In general, it can be stated that the firebrick used should be high-temperature brick for arches and walls where overfeed stokers with chain grates are employed, with temperatures running up to 2800 deg. Fahr.; but with underfeed stokers the temperatures would not run much above 2400 deg., operating at a 200 per cent rating, if proper firing is used, and a high-heat resisting brick is not as essential as one of mechanical strength and resistance to abrasion by slag.


21′ 8″
18′ 3″
INDICATORS SHOW POSITION OF DUMP OPENING
AIR CHAMBER
AIR CHAMBER
ADJUSTABLE OPENING FOR CONTINUOUS DISCHARGE OF ASHES
ASH HOPPER
AIR DUCT
AIR DUCT

DUPLEX STOKER SETTING

The committee also reported a design of side walls for boiler settings in use at present by one company, built up with a 9-in. wall of firebrick, a 4½ to 9-in. wall of Armstrong cork "nonpareil" brick or "sil-o-cel" brick, and a 4½-in. wall of common red brick upon which is put an airtight coating of "armorcote" roofing cement. The mechanical bond between the walls is obtained by the usual header construction.

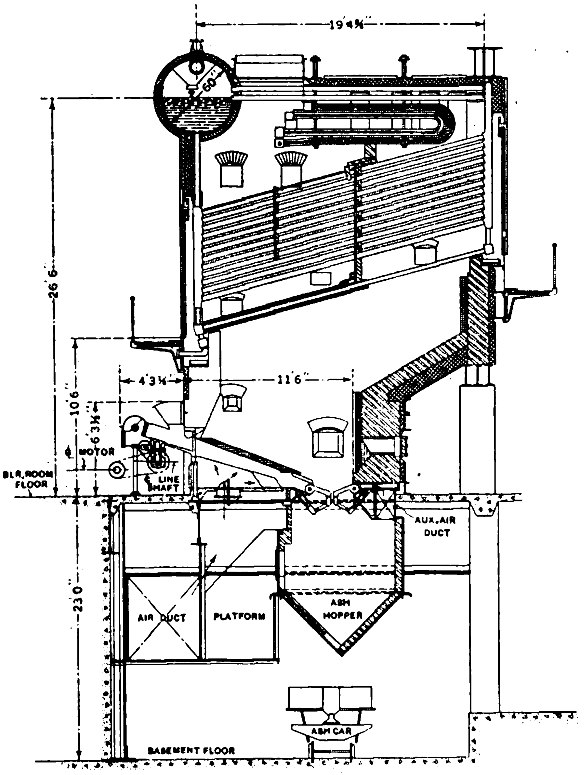
Storing and Handling Coal

In view of the great interest in coal storage at present the committee devoted considerable space to coal-handling apparatus and to the weathering and oxidation of coal. A large number of diagrams and pictures of storage and handling arrangements were given in the report. From data available it appears that the loss in calorific value by weathering in the open is not serious generally, but under certain conditions may be so. For complete protection from spontaneous heating the only sure method is storage under water. The objections to this method are the moisture contained in the reclaimed coal and the liability of freezing in some localities.

It is very difficult to arrive at a definite conclusion regarding the qualities and characteristics of coal that can be stored without danger of spontaneous heating. A fair assumption is that coal which has such characteristics as to enable it to resist atmospheric influences resulting in air slacking is better suited for storage than coal of opposite characteristics. Moisture in small quantities without doubt accelerates the absorption of oxygen and increases chemical activity. Among other methods suggested for reducing the danger of oxidation are the avoidance of external sources of heat, elimination of coal dust and the maintenance of dryness.

ARE HIGHER PRESSURES DESIRABLE?

In view of the interest in the subject of higher boiler and turbine pressures, the committee made a considerable investigation of this subject, calling attention to the fact that recently a number of stations have been designed for pressures from 275 to 300 lb. per square inch with superheats of 200 to 250 deg. Fahr. The design of the boiler presents the principal problems in connection with higher pressures. The consensus of opinion seemed to be that while it is feasible to use pressures higher than 300 lb., the practicability of doing so is still open to question. As one company put it: "The only question of any real importance is, How much money will be saved by doing it?" In commenting on the matter Frederick Sargent, of Sargent & Lundy, Chicago, Ill., stated that the Commonwealth Edison Company has been planning to raise boiler pressures in the Northwest Station in Chicago but found that considerable changes in boiler design would be necessary. He pointed out that along with the raising of initial temperatures it is important to raise the average temperature in the turbine, which can be done by superheating the exhaust from the high-pressure end of the turbine before it enters the low-pressure end. If this is done and efficiencies are maintained all along the line, it will be possible to produce a kilowatt-hour at the switchboard for one pound of high-grade coal.



LATE TYPE OF SETTING FOR LARGE BOILER

Summing up the matter, the committee comes to the conclusion that a steam pressure of 300 lb., with 200 deg. superheat, or an equivalent total temperature, is about the practical limit until the manufacturers of prime movers and auxiliaries have developed new designs to meet the new temperature conditions.

OTHER MEANS FOR PRODUCING POWER PLANT ECONOMY

Along with the discussion of design characteristics of prime movers the committee investigated the methods of operation which would maintain or improve operating economy. One of the most important things is to keep the condensers clean. This cleaning may be divided into three stages: Clearing out the tubes without taking the prime movers out of service, cleaning during the night when the unit is out of service, and more general and thorough cleaning, which is done in certain cases only once or twice a year. Among the methods used for this cleaning are washing the tube sheets and tubes with a stream of water under high pressure, shooting leather disks through the tubes by means of compressed air, forcing bristle brushes through the tubes with the aid of water pressure, and baking by allowing steam to enter the condenser through the prime mover or from special lines connected to the bottom of the condenser. Where condensers need be cleaned only once or twice a year, sand blasting is used with success in removing scale.

Attention should also be given in power plants to the matter of keeping down pressure reductions in pipings and fittings. Where formerly steam velocities of 2000 to 3000 ft. per minute were commonly met with, values as high as 7500 ft. are now found, and certain authorities are advocating velocities above 10,000 ft. per minute. High velocities mean increased pressure drops, and, while there are certain advantages in their use, the fact remains that not enough consideration has been given to the subject of pressure drop in installing steam-generating equipment, piping and valves.

Pressure loss is an important factor for the reason that the capacity of most machines decreases materially when the pressure decreases as the loss of pressure does not take place wholly within the piping itself. Among the sources of pressure drop may be mentioned the dry pipe at the boiler, the superheater, the boiler valve, the boiler feed line, the separator and the steam strainer.

Another matter is the use of boiler-room instruments. Pressure and draft gages, thermometers, steam, air and water meters, coal-weighing devices and apparatus for gas analysis are all available. This year the committee made its first report on the subject of boiler-room instruments, comparing the several types available for each type of measurement. Among other novelties attention is directed to the air meter for use in the boiler room. This, in connection with the steam flow meter, gives an excellent indication of the carbon dioxide in the flue gases. Among water meters those of the V-notch type seem to be most popular, as they are easy to clean and calibrate and are particularly adapted to cases in which a gravity fall through the meter is permissible.

Summing up the report of the committee on prime movers, it would seem that most rapid development is being made at present in the furnace end of the steam boiler, while the hope for the future in increasing boiler output is in the use of higher temperature involving both higher pressure and greater superheat. From the operating side progress is being made in maintaining equipment with high efficiency as an aid to which the intelligent use of instruments is essential.

PROGRESS IN ELECTRICAL APPARATUS

While less extensive than the report on prime movers that of the committee on electrical apparatus, with the related reports on underground construction, overhead lines, etc., was also quite comprehensive. The standardization of electrical apparatus and methods of operation was considered of very great importance and during 1916 substantial work was done in the revision and extension of standards for transformers. In synchronous converters, sizes have increased steadily although slowly, the largest converter built to date having a continuous rating of 6825 kw., and the largest 60-cycle converter having a capacity of 5800 kw. Experience and improvement in the design of synchronous converters have made possible the elimination of the second starting tap, and it is now general practice to use on partial starting voltage a tap requiring one three-pole, double-throw switch (for 6-phase converters).

In order to prevent undue rise of potential in the shunt field winding of the converter, due to transformer action, it has been customary to use a field break-up switch, but one manufacturer is now using a three-pole, double-throw switch with discharge resistance mounted on the starting panel adjacent to the starting switch.

The committee on electrical apparatus also gave considerable attention to the outdoor substation and to the automatic substation both for low-tension commercial work and for use on railway circuits. Attention was called to the fact that these automatic substations have a particularly useful application in view of the present high price of copper. Progress is being made in the standardization of outdoor substations for commercial service, and outdoor current transformers and other suitable equipment have been developed. The committee stated that large users of transformers, oil circuit breakers, electrolytic arresters and feeder regulators are becoming more and more convinced of the necessity for periodically inspecting and testing insulating oil, and of dehydrating and purifying oil that has absorbed moisture. It was recommended that all companies adopt systems of oil inspection, and to this end the committee gave full instructions for testing oils.

PROGRESS IN THRUST BEARING LUBRICATION

Attention was also directed to the problem of furnishing adequate lubrication for bearings of hydroelectric generators. A new plan for this purpose consists of the use of an oil pump mounted in a casing supported from the lower guide bearing of the machine. The pump so placed in the reservoir or casing pumps oil through a filter mounted immediately alongside of the machine. After being filtered the oil returns by gravity through a separate chamber to the reservoir, where another pump, geared directly to the main shaft, forces it into the chamber that supports the thrust bearing. It flows then by gravity to an upper and lower guide bearing back to the lower reservoir. Along this same general line it is of interest to note that many spring-thrust bearings are now in successful operation, the largest carrying 225,000 lb. at a speed of 514 r.p.m. The stationary ring in this bearing is supported on a cushion of coiled springs. This ring, like the rotating ring, is grooved radially to permit circulation of oil.

The committee on underground construction and electrolysis reported on current capacity of cables; cable specifications for various classes of service; use of split-conductor cable; new design of three-conductor cable, and special devices and methods. It appears that much progress is being made on the first-named topic, and the conditions which determine the safe current capacity are being formulated. Split-conductor cables are coming into use, their purpose being to permit the use of protective devices to cut cables out of service automatically in case of trouble, without recourse to separate pilot wires. A plan involving the use of pilot wires consists in tripping the circuit breakers on the ends of the line through the medium of a balanced relay connected to the two ends. When the current entering and leaving the cable is the same the relay does not act, but if there is a short-circuit between the ends the relay field is unbalanced and the relay trips the breakers.

OVERHEAD LINE MATTERS

The committee on overhead lines and inductive interference reported that it had not undertaken to give attention to the details of overhead line construction to any considerable extent but had accumulated certain test data on the strength of standard 1½-in. locust pins, and was keeping in touch with the experience of companies using medium hard-drawn wire. It also recommended that the companies co-operate in gathering data relative to the effect of the application to actual construction of the line sections of the National Safety Code. The committee discussion of inductive interference related entirely to non-railway circuits but is of interest to railways which are doing a power business in suburban communities. The interference cases are mostly due to the necessary use of highways for power transmission lines. In this connection an appendix to this report, by John B. Taylor, is valuable in stating in an elementary way the causes and principles of prevention of inductive interference.

On the subject of power transmission and distribution, a paper by J. O. Hardin of the Georgia Railway and Power Company, on "Methods for Working on Live High-Voltage Lines," was to have been read at the convention. This contains an account of the practices of the company in eliminating interruptions to service due to cutting off power for repairs on the line. By the use of simple special tools and easily understood rules it is possible to make repairs on almost any kind of high-voltage lines without interrupting service. Mr. Hardin tells exactly how this can be done and his paper is elaborately illustrated.

Electric Tramways in Australia

The following table is taken from official statistics relating to electric tramways in the commonwealth of Australia, published in a recent issue of *The Electrician.* Compared with 1915, there was an increase of 39.5 route-miles of line opened and in the number of cars employed. Of the 386.56 miles operated, 311 are standard gage, 71 are 3-ft. 6-in. gage, and the remainder 5-ft. 3-in. gage.

The various tramway services, including electric, steam, cable and horse, are controlled as follows: Government, 296¼ miles; municipal, 123½ miles; private, 142¾ miles.

STATISTICS ON ELECTRIC RAILWAYS IN AUSTRALIA

State	Mileage (Route) Open	Capital Cost	Energy Generated (Kw.-Hr.)	Tram-Miles Run	Gross Revenue	Working Expenses	Passengers Carried	Number of Cars
New South Wales	150.04	£7,349,866	81,689,000	25,407,000	£1.834,023	£1,469,226	269.634,000	1,430
Victoria	70.57	1,061,067	7.500,000	4,436.000	204,671	151,543	30.676,000	193
Queensland	38.20	1,437,550	10,002,000	4,112,000	347,437	193,367	48,162,000	154
South Australia	57.00	1,517,148	11,584,000	4,914,000	309,915	191,070	42,287,000	170
Western Australia	50.75	1,092,285	4,984,000	2,782,000	181,340	129,422	17,501,000	121
Tasmania	20.00	336,214	1,368,000	925,000	62,317	43,514	7,183,000	52
Total for Commonwealth	386.56	£12.794,130	117,127,000	42.576,000	£2,939,703	£2,178,142	415,443,000	2,120

Higher Revenues Asked in New York

Special Electric Railway Committee Informally Shows to First and Second District Commissions the Need of Financial Relief—Six-Cent Fare Suggested Up-State, and Two-Cent Transfer Charge in New York City—Formal Hearings to Be Held Soon

THE last week has seen marked progress in the movement to secure increased revenues for electric railways in the State of New York. Informal conferences have been held between a special committee of the New York Electric Railway Association and the Public Service Commissions for the First and Second Districts, to show to the regulatory bodies the urgent need of the companies for higher fares.

As a result of these conferences it is probable that formal applications for relief will be made to the two commissions in the very near future, and public hearings will then be held. The general sort of relief desired in the First District, or New York City, appears to be a 2-cent charge for transfers, while the up-State lines in the main prefer an advance in the unit rate of fare.

SPECIAL COMMITTEE APPOINTED

The first step in the general movement was made on May 11, when the New York Electric Railway Association, at a special meeting in New York City, authorized the appointment of a committee of ten to consider ways and means for obtaining additional revenues. This committee was instructed to take the matter up with the commissions and to secure, if possible, the general consent of the companies to some plan of action.

In view of the possibility that the railways in the Metropolitan district might desire a form of fare increase different from that favored in the remainder of the State, it was decided that the committee of ten, while acting as a whole on matters of policy, should be divided into groups of five members for each regulatory district. Each group could then take up the specific needs of the railways in its territory.

As a result of this action by the association, President J. P. Barnes appointed as members from the First District the following: T. P. Shonts, president New York Railways; T. S. Williams, president Brooklyn Rapid Transit Company; E. A. Maher, Sr., president Third Avenue Railway; W. O. Wood, president New York & Queens County Traction Co., and A. E. Kalbach, receiver Second Avenue Railroad. For the Second District President Barnes appointed the following: L. S. Storrs, vice-president Westchester Street Railroad; H. E. Andrews, president New York State Railways; H. B. Weatherwax, vice-president United Traction Company; C. Loomis Allen, receiver Empire United Railways, Inc., and Joseph K. Choate, vice-president J. G. White Management Corporation. Mr. Choate was made chairman of the committee.

PRESIDENT SHONTS ISSUES STATEMENT

While this special committee was laying its plans and arranging to present its case informally to the Public Service Commissions, the New York Railways took several steps to inform the public about the general situation confronting the company. On May 14 President Shonts issued an explanatory statement in part as follows:

"This company has for sometime past been confronted with a very grave increase in the cost of operation. That tendency has recently become alarming. During the last year we have increased the wages of our men to enable them to take care of the high cost of living. We are paying very much higher prices for the materials we use. The number of people traveling on the surface lines of the city of New York has not increased substantially in the last ten years. Any increase of electric railway travel in this city of recent years has been almost entirely on the elevated and subway lines. That increase, of course, does not benefit the surface lines. The subway and elevated lines are prospering, but the surface lines are threatened with bankruptcy unless present tendencies are arrested.

"It is absolutely necessary that the New York Railways improve their revenues. Though the stock of the New York Railways is owned by the Interborough Consolidated Company, that stock pays no dividends and it is not conceivable that under any conditions which can now be foreseen in the near future, any payment on such stock would be possible. We are not now concerned with attempting to earn dividends on that stock. Our concern is to save the green car lines from receivership, for toward receivership these lines are moving with a steadily accelerating pace.

"A good many years ago all the surface lines in New York were consolidated into one system. That system went into bankruptcy, and the result was a disintegration of the formerly unified system. That disintegration separated the Third Avenue and the Second Avenue lines from the old system, disturbing the transfer arrangements which had previously existed. If the New York Railways is forced into a receivership, a further disintegration of the system is likely, with disturbance of the present arrangements between the different units of the system. In case of such disintegration, the separate companies, then restored to their managements, would, of course, have the right to charge independent fares for each passenger. The people of New York City pay a nominal 5-cent fare for a ride on their street railways. The subway and elevated lines obtain a full 5-cent fare for each passenger. Owing to the transfer arrangements the result to the New York Railways is only about 3½ cents for each trip.

"We expect shortly to bring the matter formally to the attention of the Public Service Commission to obtain, we hope, its advice and assistance in increasing our revenues. Before doing so, however, we wish the whole subject to be brought to public attention, in order that the public may be both informed and consulted as to what steps shall be taken before these steps are definitely attempted.

"We shall expect to lay all the facts before the people of New York, for we realize that the good-will of the public is a supremely important factor in this, as in other matters. Our purpose is to protect our service to the people of this city, and to that end we earnestly seek the co-operation of every citizen. We feel confident that the public sense of what is fair and right will, upon consideration of the facts, realize that our needs are real and that to satisfy them will be in the public interest."

ASKING THE CO-OPERATION OF BUSINESS MEN

In line with his policy of informing the public, President Shonts on the same day sent letters to the presidents of the Chamber of Commerce, the Merchants' Association and other leading commercial and taxpayers' organizations, offering to show them the company's books and inviting them to examine the facts. After explaining the serious situation in which the company finds itself, President Shonts said:

"I am writing to you and to various other representative organizations of business men and taxpayers to request that you refer this matter to an appropriate committee of your organization with a suggestion that we should be glad to place before such committee full data in support of what we believe to be the merits of our position. We shall place ourselves at the service of such committee to enable it to arrive at a conclusion entirely satisfactory to itself.

"We earnestly hope to solve this problem in a way which will commend itself to the public opinion of New York. We shall shortly bring the matter formally before the Public Service Commission. In the meantime we are earnestly hoping that the people of New York, through such representative bodies as those mentioned, will inquire into the situation for themselves."

ANNOUNCING ITS 2-CENT TRANSFER PLAN

On May 15 President Shonts placed the need of a 2-cent transfer charge before the public in a statement in part as follows:

"It is not the purpose of the New York Railways to ask the Public Service Commission for permission to charge a 6-cent fare. We hope to be able to adhere to the present basic rate. We shall ask permission to charge 2 cents for transfers; in other words, to carry people as far as they want to go on a continuous ride for 5 cents, but to ask those who take additional rides to pay something for them.

"The cost of labor and materials is increasing at a greater rate than the present earning power of the New York Railways can stand. Taxation has each year taken more than $1,500,000 on the average for the last five years, or more than 11 per cent of our gross revenue from railway operations. Greater tax burdens must be met in the immediate future. After paying interest on its bonds, and with no payment on its stock, the New York Railways in 1916 had $2.70 left from its earnings for the year. The company paid out for wages $5,297,000 in the year ended June 30, 1916; it will pay during the current fiscal year, $6,336,000, an increase of $1,839,000. Part of this increase is due to extra allowances to the men to maintain the service during the strike, but the present scale of wages, even upon a comparative basis, is more than $600,000 in excess of that for 1916.

"There were 257,028,563 passengers who paid a 5-cent fare on our lines last year. About 92,000,000 of these used transfers, leaving about 165,000,000 who paid 5-cent fares and took no transfers. Before increasing the fare charged to those who took no transfers, it would seem only fair to ask those who used two or three to pay for the privilege. We estimate that a charge of 2 cents for transfers will add about $900,000 to our gross income. This sum added to our earnings will not enable us to pay dividends on stocks; it will simply protect the company from bankruptcy."

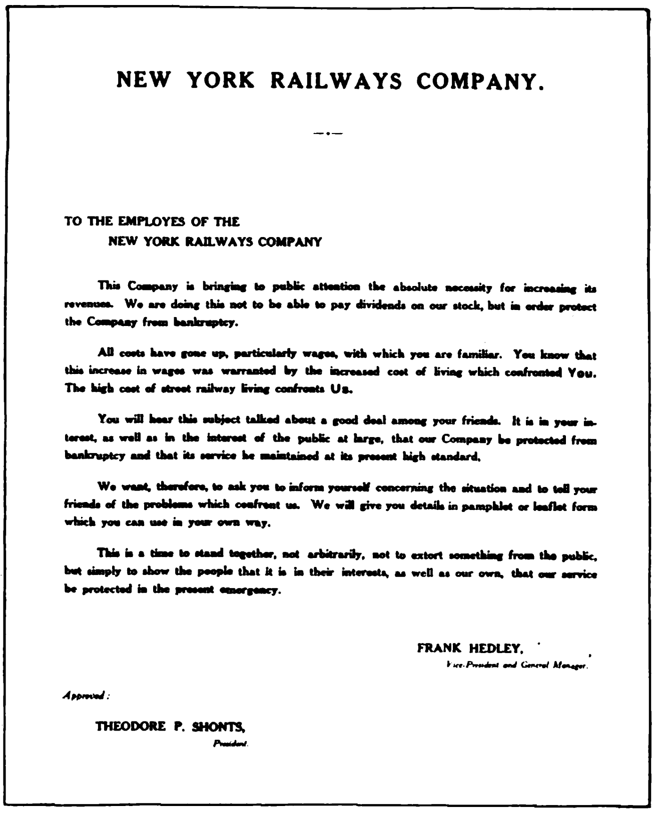
The New York Railways also placed on all its employee bulletin boards a placard, as shown in the accompanying illustration, calling attention to the revenue-increase movement and asking employees to inform themselves concerning the situation and tell their friends.

VALUATION NOT NEEDED

In regard to the necessity of a valuation of the New York Railways property, President Shonts issued a statement to the effect that a valuation was made while the property was in the hands of receivers. Both the reorganization committee and the engineers of the Public Service Commission made careful appraisals, he said, and the lowest figure found by the commission was, as of Oct. 1, 1910, $85,801,000. On account of capital expenditures the minimum valuation is now $89,066,000 for property actually in public service.

The aggregate amount of stocks and bonds in the hands of the public (including underlying bonds of merged companies and including the stocks and bonds of leased companies) in 1916 was $99,454,978. The entire return actually received by the holders of these securities was $3,455,610, or 3.5 per cent upon the total amount of securities issued. This money paid to the holders of securities represented 3.9 per cent upon the minimum valuation.

A charge of 2 cents for a transfer, bringing in about $900,000, would permit a return representing only 4 per cent upon the total capitalization and 4.9 per cent upon the minimum valuation. The stockholders, President Shonts said, have never received a dividend, and the holders of the adjustment income 5 per cent bonds have never received the full interest. For the last ten months of the current year, exclusive of strike expenses, the company has not even earned the interest on its 4 per cent bonds.



NEW YORK RAILWAYS COMPANY.

TO THE EMPLOYES OF THE
NEW YORK RAILWAYS COMPANY

This Company is bringing to public attention the absolute necessity for increasing its revenues. We are doing this not to be able to pay dividends on our stock, but in order protect the Company from bankruptcy.

All costs have gone up, particularly wages, with which you are familiar. You know that this increase in wages was warranted by the increased cost of living which confronted You. The high cost of street railway living confronts Us.

You will hear this subject talked about a good deal among your friends. It is in your interest, as well as in the interest of the public at large, that our Company be protected from bankruptcy and that its service be maintained at its present high standard.

We want, therefore, to ask you to inform yourself concerning the situation and to tell your friends of the problems which confront us. We will give you details in pamphlet or leaflet form which you can use in your own way.

This is a time to stand together, not arbitrarily, not to extort something from the public, but simply to show the people that it is in their interests, as well as our own, that our service be protected in the present emergency.

FRANK HEDLEY,
Vice-President and General Manager.

Approved:

THEODORE P. SHONTS,
President.

PLACARD ASKING CO-OPERATION OF EMPLOYEES IN MOVEMENT FOR INCREASE IN FARES

CONFERENCE WITH FIRST-DISTRICT COMMISSION

On May 16 Messrs. Shonts, Williams, Kalbach, Wood and Maher, Sr., representing the special committee of the State association, held an informal public conference with the members of the Public Service Commission for the First District. At the close of the conference Mr. Maher announced that the ommittee would be ready to proceed with formal hearings by the next week. No date was set by the commission. However, Chairman Straus announced that a date would be set after a formal application had been made, in connection with which there would be a conference between railroad and commission counsel, with reference to the form or forms that the application should take. It was practically decided, the commission stated, that each company or system should make a separate application for relief.

The first speaker at the conference was Mr. Maher, who stated that he hoped the commission would do something quickly to help the companies out of a situation that was momentarily growing worse. The commission, he believed, could grant relief.

Mr. Shonts stated that in the last thirteen years the surface-line traffic in Manhattan had decreased one-tenth of 1 per cent. There had been some increases, but these had been more than absorbed by decreases incident to the opening of the rapid transit lines. The surface-line traffic, therefore, is practically stationary. The only seeming relief available is a 2-cent charge for transfers—something that would not affect the great bulk of the traffic, would leave the company probably $2,000,000 short of an 8 per cent return, but might be sufficient to tide it over until a decrease should come in the cost of materials, labor and other essentials of electric railway operation.

Mr. Williams, who followed Mr. Shonts, stated that the situation was somewhat different in respect of his company. He referred to the commission's order of three years ago which vastly increased the number of transfer points and the number of transfers issued on the Brooklyn lines. "That order has been obeyed," said President Williams, "but its effects have been increasingly bad from the standpoint of providing less revenue for us. It seems to us that our natural, easiest way of relief is by having that order changed. We have no thought of depriving a passenger of a continuous ride upon one line or possibly two lines, but the system of granting transfers to many lines has grown into an abuse. Hence it is likely that we shall make a formal application for a modification of the commission's transfer order so that while the passenger will still have a 5-cent fare from the residence sections of Brooklyn to the business section of Brooklyn and Manhattan, we shall be allowed to make a charge of 2 cents for transfers except as to transfers to and from what are commonly termed 'feeder' or 'continuing-trip' lines. It is not a question of receivership with us. It is a question of progressing. We believe that we are a progressive company, but we must have sufficient earnings to justify the construction of new lines as they are needed if we are to serve Brooklyn properly. The company must have a sufficient margin of credit."

Mr. Kalbach stated that what his company needs is additional transfer privileges at 2 cents, that line having practically no transfers except to a separate cross-town line. Mr. Wood said that he would only ask that something be done sufficient to permit his company to meet its operating expenses and fixed charges.

Question of Power

Considerable discussion was carried on during the conference in regard to the provision of law upon which the committee expects to base its request for an increase in rates. J. L. Quackenbush, general attorney New York Railways, contended that under the present law the commission has plenary power to fix rates. According to Mr. Quackenbush, the Ulster & Delaware and North Shore Traction Company decisions clearly point out that the commission has, until the Legislature decides otherwise, the unrestricted power of the Legislature in rate regulation. Moreover, the commission can fix the terms and conditions of transfers, extend their use or abolish them altogether. Mr. Quackenbush said that the city companies wanted to charge for only the first transfer. Other transfers would be negligible as far as any advantage the companies might gain by making passengers pay for them.

Hearing Before Second District Commission

Simultaneously with the conference in New York City a meeting was being held in Albany between the other half of the special committee and the commissioners for the Second District. The electric railway men in attendance were Messrs. Choate, Storrs, Andrews, Weatherwax and Allen, as well as T. C. Cherry, general manager Empire United Railways, Inc.; C. K. Addison, Long Island Railroad, and President Barnes.

Mr. Choate was the spokesman for the railway men. Many of the companies in the State, Mr. Choate urged, face a condition already bordering upon bankruptcy. He presented figures to show that the cost of materials for street railways has mounted from 40 to more than 100 per cent during the last three years; that wages have gone up, and that only the city fares of the companies have remained stationary. He said that severe pressure was being brought upon the companies to grant further wage increases on account of the great increase in ordinary living expenses. As a means of obtaining partial relief, Mr. Choate asked that the street railways be permitted to petition the commission for a uniform advance of fares from 5 to 6 cents.

"The manufacturer," said Mr. Choate, "can raise his price to keep pace with his costs. It is what every private enterprise has been doing. Every item that enters into the cost of living is increasing. Street railway costs are mounting on a faster ratio than any other, yet our prices have been kept at the same level."

Mr. Choate called attention to the facts shown in the commission's latest annual report, indicating that while gross earnings of street railways outside of New York City have increased within the last ten years, particularly during the increased industrial activity during the last year and a half, net earnings have shown a steady decline.

After the conference the commission stated that the street railways of every city in the State outside of New York City would probably file applications for additional revenue through increased fares, charges for transfers or other means. In view of the urgent nature of the case presented by the railways, the commission will commence hearings on these applications as a group at an early date. After the presentation of the case of the railways as a whole, the different conditions affecting each company will be taken up and passed upon by the commission.

War Revenue Tax Hearing

Electric Railways Ask Senate Committee to Tax Long-Haul Automobile as Well as Rail and Water Transportation

At a hearing before the Senate finance committee on May 12 the electric railway industry presented its comments upon the war revenue tax bill, which is designed to produce $1,800,000,000. The main suggestion made was that the same tax be placed on automobile lines engaged in long-haul passenger and freight transportation as is imposed upon electric interurban railways.

Section 500 of the bill, as far as electric railways are concerned, provides for the following: A tax of 3 per cent of the amount paid for transportation of freight by rail or water; a tax of 10 per cent for transportation of property by express; a tax of 10 per cent of the amount paid for transportation of persons by rail or water, not including the amount paid for commutation or season tickets for trips less than 30 miles or fares less than 25 cents. These taxes are stated in broad terms. The following sections deal with modifications, exceptions and technicalities which will undoubtedly be revised by the Senate committee before the bill is reported.

In seeking a hearing on the foregoing provisions, the electric railway industry did not endeavor to use any more time than was granted to other industries. Indeed, not so much time was used as in some instances. The attitude of the industry was explained to the Senate committee at a brief hearing by Arthur W. Brady, president Union Traction Company of Indiana, Anderson, Ind. Mr. Brady represented the American Electric Railway Association and also, with others present, the New York Electric Railway Association, the Pennsylvania Street Railway Association, the Central Electric Railway Association and the California Electric Railway Association.

Mr. Brady explained that he was speaking especially in behalf of the interurban lines, because the 25-cent limitation for the tax basis would cut out the ordinary street railway fare. The interurban lines, he said, had since the advent of the automobile been confronted with active competition in certain parts of the country on an extensive scale. Regular automobile lines had been established, for instance, between San Francisco and Los Angeles, Cal., a distance of practically 500 miles, and between San Diego and Los Angeles. For several years property and persons have been carried by automobile between those points over the regularly established lines, and the same way between Los Angeles and Bakersfield. In Minnesota, lines are in active operation for a distance of 30 or 40 miles out of St. Paul and Minneapolis. In Indiana and the Central West there are lines of from 10 to 35 miles already in existence, and with the improvement of roads in the progress of the good-roads movement and the building of the hard-surface, bricked or concreted roads, that phase of competition is developing very rapidly. Continuing, Mr. Brady said:

"The result of imposing the 10 per cent tax upon the electric interurban business and leaving the automobile business exempt would be simply to place the interurban railroads at a very great disadvantage in the conduct of that business. There is no one of the utility businesses of the present day that is conducted upon a closer margin than the electric railway business, whether it be the street railway business or the interurban business. Therefore, as a matter of mere fairness, it is the belief of the electric railways that this same tax which is imposed upon the electric railways should be imposed also upon motor transportation between specified points. It is not meant that it should cover the taxicabs and other vehicles which make special or occasional trips."

To meet the situation Mr. Brady proposed an amendment to the effect that the tax should cover transportation "by automobiles operated as common carriers of persons or property between specified points." The 25-cent fare clause in the bill would eliminate all but the long hauls.

Mr. Brady was questioned, during his statement, by the various Senators. In replying to a query regarding the comparative costs of automobile and electric railway operation, he said:

"It was thought a few years ago by the electric railway people that the automobile could not stay in the game. But it has proved that it can. You cannot run a Packard automobile in competition with the ordinary electric railway. But you can run a Ford, and a number of the other lighter and cheaper cars. With good roads and highways supplied by the public, with no expense except that of gasoline and tires and ordinary maintenance, we fear very much that these cars can compete with our lines to an appreciable extent in carrying freight. We know that they actually are trying to do it."

Another amendment proposed by Mr. Brady covered the handling of fractions of a cent in imposing the tax upon the passenger or shipper. In order to make it clear that a full cent might be added to the fare or freight in such a case, the following amendment was proposed: "Whenever the addition thus made to any fare or other charge shall include a fractional part of a cent, 1 cent may be added by the carrier for and including such fraction." The especial importance of this amendment to electric railways, Mr. Brady stated, is found in the fact that their fares are in a very large number of cases, approximating probably one-half, paid upon the cars in cash to the conductors. This is true even in the case of the longer interurban rides. It is highly important, therefore, that opportunity for controversy be eliminated and the convenience of calculation be facilitated as far as possible. The slight addition to the charge thus provided for would not begin to compensate the carrier for the expense of accounting which the imposition of the tax would cause.

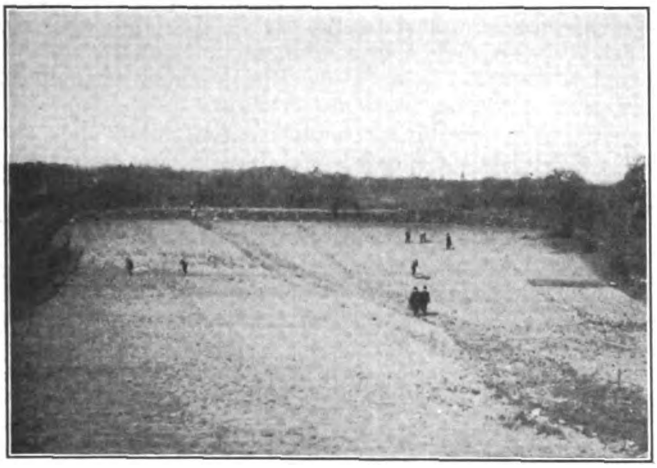
War-Time Economies

Plan for Trainmen to Help Farmers—Women Now Being Considered for Front-Platform Duty

DURING the past week reports from electric railways that are considering the use of women employees continue in evidence. The movement to increase agricultural production has also progressed, and at the present time a large percentage of the railway companies have under cultivation most of the unused land that they hold. A new phase of the movement appears in the recent action of the Beaver Valley Traction Company, New Brighton, Pa., where plans are being laid to have employees co-operate with farmers during harvest time.

The proposed arrangement is outlined in the following abstract of a bulletin to train men published by W. H. Boyce, superintendent Beaver Valley Traction Company: "How many of you would be willing to aid the State and nation by co-operating with such of the larger farmers as might need your services at planting or harvesting time? For possibly two or three days a week, half of our force could go to the country, and of course on these two or three days the other half of the force would have to work double time. This won't be nearly so much of a hardship as some of our boys are going to go through in France. No doubt the farmer would be willing to pay for your services, and the man who stays on the job and works an eighteen-hour turn, together with the man for whom he is working and who has gone to the farm, can pool and divide equally the wages for that day. I am afraid that the gravity of the situation has not been fully appreciated. If we do our duty as American citizens we are going to have work, and plenty of it, cut out for us before another year rolls around. Will you co-operate?"

On the New York, Westchester & Boston Railway, an unusually elaborate plan for truck gardening has been introduced owing to the large amount of unused land held by the company. Early in April all of the employees were notified that the use of such property would be available for gardening purposes, and about 25 per cent of them took advantage of the offer. The plots averaged from one-sixth of an acre to a full acre, each man being given as much property as he desired after he assured the company he would be able to cultivate it. At the present time all of the plots have been plowed and harrowed, and some planting has been done. Each employee has been furnished with pamphlets of instructions regarding this work, issued by the New York City Commission and by the United States Government, as well as copies of the book of instructions of the Bureau of Agriculture, on the raising of vegetables on a small scale. Last week arrangements were made with a well-informed gardener and farmer to deliver a lecture to the men so that they could learn how to plant properly and how to store the vegetables which they raise, so that these may be kept during the ensuing winter. With each plot there has been issued a permit providing space for a sketch map of the plot in question, as well as the rules governing the use of the land. The latter require the property to be used for garden purposes only, and the lessee must use reasonable diligence in its cultivation and remove all incumbrances at the conclusion of the lease. The permit, including a report of the crop that is harvested, is to be returned to the company at the expiration of the lease.



WAR-TIME ECONOMIES—UNUSED LAND OF THE NEW YORK, WESTCHESTER & BOSTON RAILWAY UNDER CULTIVATION

EMPLOYMENT OF WOMEN

The employment of women as conductors is still being considered as a possibility by a number of electric railway companies. One feature of this movement is the report that thirty young women of Flushing, N. Y., members of the National Association for Women Service, have volunteered their services as conductors to W. O. Wood, president New York & Queens County Railway. The ostensible reason put forward for this flattering offer is that there is expected to be a shortage of men because of the war.

From England comes a report that the general use of women as motormen is being given serious consideration. This is put forward as the only alternative to a severe curtailment of the tramway service, or even in some cases its entire suspension, owing to the increasing demands for more men by the military authorities. Statements are made that where women have been tried as motormen they have been generally successful. At Glasgow, where they have been used for more than six months, their duties have been performed satisfactorily, and in general they have displayed resourcefulness in the emergencies which have arisen from time to time in connection with the operation of cars. The service in Glasgow is relatively fast, and the vehicular traffic very heavy, so that there is believed to be no insuperable difficulty in finding women able to cope with the conditions elsewhere in the United Kingdom, with the possible exception of a few streets in the metropolitan districts of London.

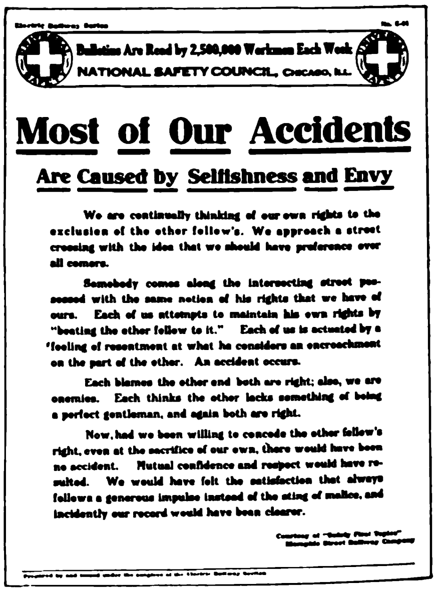
On the East St. Louis & Suburban Railway the possibility of using women conductors in the event of war emergencies was recently placed before the platform men, who eventually waived all objections on patriotic grounds. On the lines of the Puget Sound Traction, Light & Power Company the possibility of using women operators on one-man cars is being seriously considered as an eventual possibility. In an order of the local Public Service Commission permitting the traction company to put on a number of these light cars in Seattle, the equipment is specifically described as being of a type handled by one "operator," the use of the term "man" being intentionally avoided. These cars, it is said, will be used on short runs, and under these circumstances women are expected readily to qualify for their operation.

Employees of all of the public service corporations of Greater New York are being mobilized through the co-operative action of the various companies and the Public Service Commission, and a number of committees have been appointed to centralize control of the resources and facilities of all of the organizations so that they may work together as a unit during the present emergency. On May 17 a meeting was held to consider means for avoidance of the crippling of service through enlistments of employees who are vitally needed in their present positions, and it was decided that the executive committee of the co-operative organization should act on this matter. One of the plans suggested was for the committee to take up with the exemption boards, which will be appointed subsequent to registration for universal military service, the need for exempting certain specially trained public utility employees, whose services were vitally necessary to the public welfare.

Co-operation Between Railways and N. S. C.

The accompanying reproduction of a recent National Safety Council electric railway poster shows how individual railways can co-operate with the council in the national movement. This can be done by preparing suitable material for local use which can later be brought to the attention of the industry through the council bulletin service. In the present case the source of information is *Safety First Topics*, which is published monthly by the Memphis (Tenn.) Street Railway.

An account of the first issue of this publication appeared in the ELECTRIC RAILWAY JOURNAL, Aug. 12, 1916, page 294. Its purposes are to keep the employees thoroughly informed of all activities of the company in the safety-first movement and to publish comment and discussion from them.



Bulletins Are Read by 2,500,000 Workmen Each Week
NATIONAL SAFETY COUNCIL, CHICAGO, ILL.

Most of Our Accidents

Are Caused by Selfishness and Envy

We are continually thinking of our own rights to the exclusion of the other fellow's. We approach a street crossing with the idea that we should have preference over all comers.

Somebody comes along the intersecting street possessed with the same notion of his rights that we have of ours. Each of us attempts to maintain his own rights by "beating the other fellow to it." Each of us is actuated by a 'feeling of resentment at what he considers an encroachment on the part of the other. An accident occurs.

Each blames the other end both are right; also, we are enemies. Each thinks the other lacks something of being a perfect gentleman, and again both are right.

Now, had we been willing to concede the other fellow's right, even at the sacrifice of our own, there would have been no accident. Mutual confidence and respect would have resulted. We would have felt the satisfaction that always follows a generous impulse instead of the sting of malice, and incidently our record would have been clearer.

Courtesy of "Safety First Topics"
Memphis Street Railway Company

RECENT N. S. C. POSTER ON ACCIDENT-PREVENTING COURTESY

COMMUNICATIONS

Practical Trials Suggested for Equalizer-Bar Trucks

THE J. G. BRILL COMPANY
PHILADELPHIA, PA., May 16, 1917.

To the Editors:

It would be probably a beneficial happening if the interest in truck design, manifested in the communications in your May 5 issue by F. M. Brinkerhoff and W. F. Keisel, Jr., would become more general. Doubtless both the operating railroad man and the truck-designing engineers would welcome a condition which would make your columns the medium for a free and open discussion of this much-discussed yet never-settled question of truck equalization.

Mr. Brinkerhoff's article bears the caption "Equalizer Bars Not Necessary," and with this statement I register in the affirmative, because equalizer bars are not necessary, though desirable. S. A. Bullock, however, prefaces his original article on the subject in your April 21 issue—I think very properly—with the remark, "It is desirable that all trucks be equalized," and one must confess that the two statements are widely different.

When Mr. Bullock's arguments are analyzed, it will be seen that his suggestion is to distribute equally the center-pin load on all points of track bearing; *i.e.*, the wheels. Mr. Brinkerhoff agrees with him in the general idea (and I think almost everyone will) but differs in the method of accomplishment. Mr. Bullock favors the equalizer bar, with which we are all familiar and which is adequately described by him, whereas Mr. Brinkerhoff leans toward a flexible side frame for the truck, contending that it gives the same result.

In an equalizer-bar type of truck, the movement of the said equalizer bar is restrained by springs which distribute the load, and if the stability of the truck would permit, these springs (theoretically to produce the best result) should be located at the longitudinal center of the truck, leaving the ends of the equalizer bar free to raise and lower as the track conditions demanded. The need for stability in the truck prevents this central point of bearing. By the very design, however, the nearer the center the more thorough the equalization, with relatively the same degree or uniformity of vertical stress. With the flexible frame design, in my judgment, there is no attempt whatever at equalization, and the stresses consequently vary according to the degree of flexibility, no mechanical means being introduced to equalize or distribute the weight on each of the several track-bearing points or wheels.

In passenger service I personally do not know of any cases where the arch-bar truck has proved satisfactory in comparison with an equalizer-bar truck. I think I can safely say that there have been a great many cases wherein arch-bar trucks were installed under electric motor car bodies and where their failure was most palpable. Furthermore, it is only fair to say that this was with not one make of arch-bar truck alone. Practically all the truck builders who have tried it have met with exactly the same result.

Mr. Bullock and Mr. Kiesel have disagreed with regard to the requisite spring base to produce equalization, but I rather gather they are both talking about a different item, Mr. Bullock referring to the spring base of the equalizing bars of the truck in equalized trucks, which is generally the spring base, and Mr. Kiesel referring to the spring base of the truck. In my opinion the spring base of the equalizing bar should unquestionably be less than the wheelbase of the truck. Perfect equalization would require a centrally-located spring or point for carrying the load, and as a consequence the nearest approach to this longitudinal center that will be permitted by the required stability gives the most efficient system of equalization. I contend that perfect equalization would be obtained from practically a knife edge supporting the weight on the center of the equalizing bar at the longitudinal center of the truck.

After all, a trial may be conclusive, and I recommend the following, realizing fully that while the comparison is between six-wheeled trucks and four-wheeled trucks, it is also between equalized versus non-equalized trucks: Ride on one of the most excellently appointed trains on the Pennsylvania Railroad between Philadelphia and New York, try the Pullman equalized truck and then try a Pennsylvania coach which, I claim, is mounted on a non-equalized truck. To go further, try the two types of truck, the Baldwin equalized design and the non-equalized design operating on the excellently-built road for which Mr. Brinkerhoff is largely responsible—the Hudson and Manhattan Railroad. If the difference in the riding qualities appears to others as it has to me (and I have heard it frequently referred to by laymen), and if the destructiveness to the roadbed is in proportion to the ease of riding qualities, or in anywhere near a similar proportion, the operating heads of electric lines, urban and interurban, will look with more favor on the fully-equalized type of construction which, I think, is championed by most of the truck builders.

It is undeniably true that the equalizer-bar type of truck is an "old timer," but it is equally true that it involves one of the very few principles of railroad vehicular construction that has stood the test of time.

W. H. HEULINGS, JR., Vice-President.

Higher Fares Are Necessary

THE WILKES-BARRE RAILWAY COMPANY
WILKES-BARRE, PA., May 14, 1917.

To the Editors:

I have noticed with interest the editorials in the ELECTRIC RAILWAY JOURNAL in regard to higher fares. We have remarked in our community that steps must be taken to increase the unit of fare or decrease expenses. The demand will be greater for taxes, cost of materials and cost of labor, with a probable decrease in riding. Therefore, to maintain street railway properties we must let the physical condition fall below a desirable standard or let the service become less frequent in order to make the ledger balance, let alone not making any profit. It does not take very far vision to observe the increase of labor cost and the cost of material within the past two or three years, with the end not yet in sight, and it is the duty of the railways to show the public that they must get away from the old idea that the 5-cent fare must prevail, although very few companies do receive a full 5-cent fare, it being reduced by tickets in some form or another or by a tremendous number of transfers.

There has been no definite decision on the part of this company as to what procedure it will take. Its policy has been, with a considerable degree of frankness, to tell its patrons what it is facing.

We do not think that the trolley interests of Pennsylvania will become hysterical, but they are all facing the same condition in a greater or less degree. Practically every other line of business has advanced its prices, but public utility companies must secure the assent of commissions before they can do that, and we take it that most commissions are composed of business men who can see this situation.

T. A. WRIGHT, Manager.

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

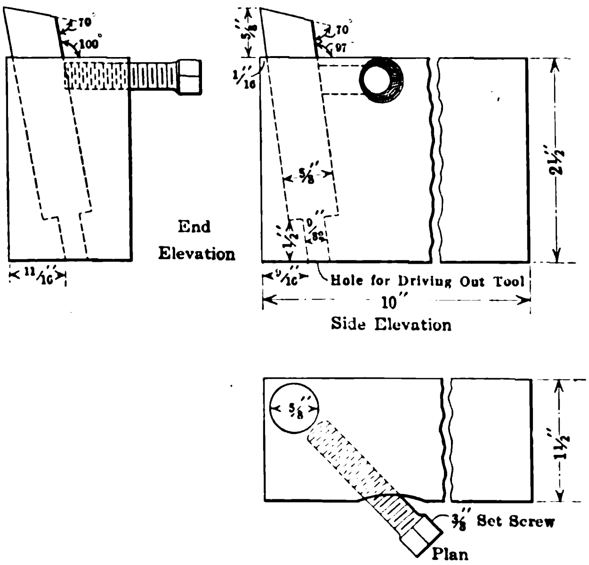
Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Tool Holder for Economical Use of Cutting Steel

BY WALTER S. TITUS

Machinist Auburn & Syracuse Electric Railroad, Auburn, N. Y.

With the present price of high-speed tool steel, economy in the use of it is highly essential. For wheel-turning purposes the writer has designed a tool holder by the use of which a piece of high-speed steel can be worn down to a very short length. The holder is particularly well adapted for use in turning wheels having hard flats, as instead of holding the tool at right angles to the wheel, which allows the tool to spring more or less when entering the hard spots, this tool is held firmly in place in a nearly vertical position. In this way it cuts through the hard spots as easily as through any other part of the tread.



TOOL HOLDER FOR USING UP SMALL PIECES OF HIGH-SPEED STEEL

The points of superiority of this tool holder over the old kind which holds the tool at right angles to the work are as follows: Economy in the use of high-speed steel, economy in grinding away high-speed tool steel, use of the tool steel with its original factory hardening treatment, ability to provide the proper top clearance to the tool, ability to use scrap pieces of high-speed tool steel by forging them to the proper size, and as the tool holder is less expensive, several of them can be made using holes of different depths. This allows one always to have a sharp tool ready, and increases the efficiency and output of the lathe.

It is the practice in many shops to weld pieces of tool steel onto machine steel shanks in order to use up the small pieces, but in using the type of holder described the original cutting tool can be worn down to a very short length and the labor and expense of welding is avoided.

Filing System for Tracings

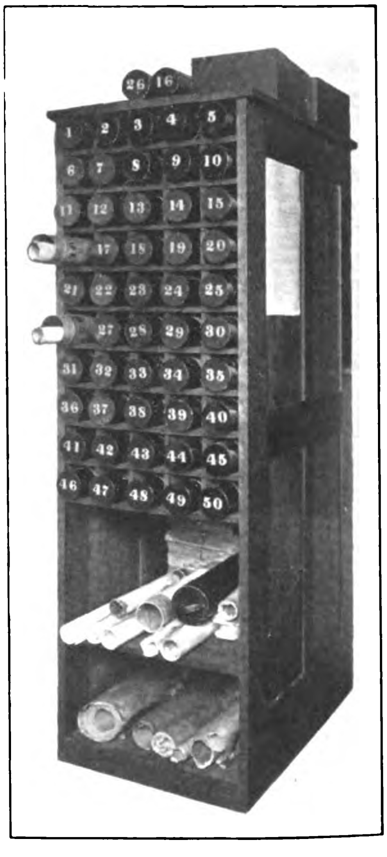
A Cabinet, Metal Tubes and a Loose-Leaf Record Book Are Used in This Simple Scheme

BY F. J. FOOTE

Master Mechanic Ohio Electric Railway, Columbus, Ohio

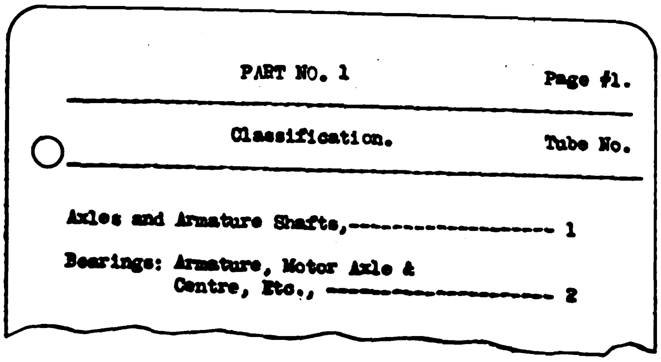
The satisfactory filing of tracings, especially in case there is no filing system being used, and where no money is in sight for an elaborate system, is a subject of great importance to any one who has many tracings in current use. The tube system described below is recommended by the writer as one which has proved adequate and satisfactory under these conditions in the office of the master mechanic of the Ohio Electric Railway. This system is somewhat similar to the one described in the ELECTRIC RAILWAY JOURNAL of March 10, page 449, but differs in several essential points.

Two essential parts compose the system—the filing case and the record book. The photograph shows the filing case (home made) with the tubes containing the tracings in place. There are fifty tubes, each 36 in. long and 3 in. in diameter, and provided with a dustproof cap. Both tube and cap are made of heavy galvanized iron. Each tube is numbered, both on the cap and tube proper. The tracings to be filed are grouped according to any desired classification; each group is then rolled up, fastened with a string or rubber band, and placed in its proper tube. The filing case is 70 in. high, 35 in. deep and 22 in. wide, and the tubes fit loosely in their respective pigeonholes. The tracings are given serial numbers, this numbering having been begun some time before the present filing system was installed.



CABINET AND METAL TUBES FOR FILING TRACINGS

For the record book, an ordinary loose-leaf record is used. This is divided into three parts, as follows: Part 1, giving a list of classifications of the tracings accord-

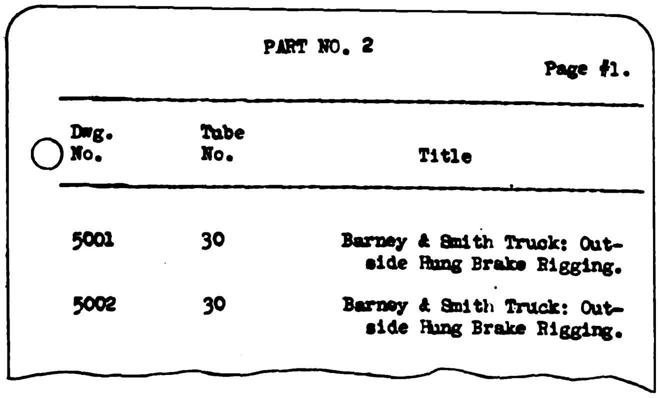


PART NO. 1 Page #1.

Classification.	Tube No.
Axles and Armature Shafts,-------------------	1
Bearings: Armature, Motor Axle & Centre, Etc., -------------------	2

RECORD BOOK HEADINGS, SUBJECT CLASSIFICATION

ing to subjects; Part 2, giving a list of all tracings in numerical order, and showing the number of the tube in which each may be found; and Part 3, giving a complete list of tracings to be found in each tube. The advantage of this last part is that by reference to it one can tell at once if a tracing of a particular part exists, and also the tracing number for it.

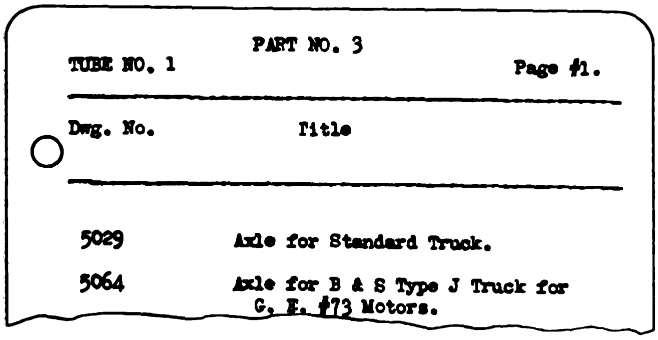


PART NO. 2 Page #1.

Dwg. No.	Tube No.	Title
5001	30	Barney & Smith Truck: Outside Hung Brake Rigging.
5002	30	Barney & Smith Truck: Outside Hung Brake Rigging.

RECORD BOOK HEADINGS, LIST OF TRACINGS ARRANGED SERIALLY

A facsimile of a portion of the first page of each part is shown. It will be noticed that each new tracing filed must be recorded in both Part 2 and Part 3. On the side of the filing case is posted for convenience a classification list which is a duplicate of Part 1 of the record book.



PART NO. 3
TUBE NO. 1 Page #1.

Dwg. No.	Title
5029	Axle for Standard Truck.
5064	Axle for B & S Type J Truck for G. E. #73 Motors.

RECORD BOOK HEADINGS, LIST OF TUBE CONTENTS

The only objection to the system that is of any consequence is that the rolling up and unrolling of the tracings is some little bother. This small disadvantage, however, is more than offset by the low cost, small space occupied, and accessibility of the system.

The Kansas City Western Railway, Leavenworth, Kan., has installed all one-man cars. The city has withdrawn its contest against the reduction in the number of employees, which had been made on the ground that such reduction meant poorer service.

Waste From Coal Mines Used in Seattle, Wash.

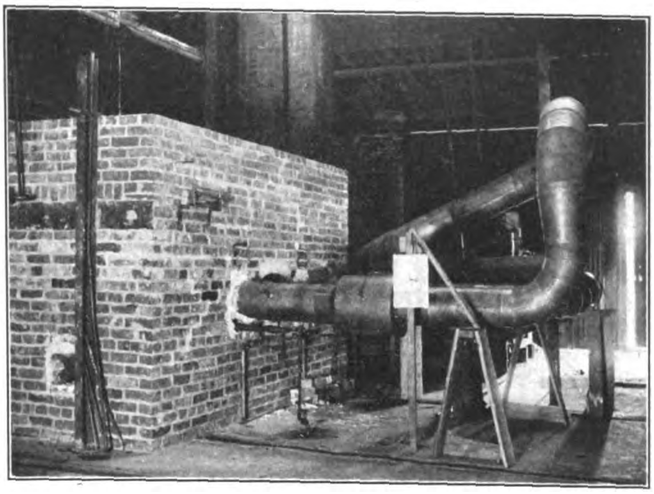
From Experiments Made It Is Practically Assured That Powdered Coal Can Be Readily Burned

BY HENRY HULL

Superintendent Steam Heat Division Puget Sound Traction Light & Power Company, Seattle, Wash.

This company has been experimenting with powdered coal, as there are within a hundred miles of Seattle numerous coal mines with thousands of tons of fine coal piled up which at present is unmarketable and which should be available at slightly above the cost of transportation.

This coal is a lignite variety particularly adapted to use in powdered form due to the high volatile constituent and the very high fusing point of the ash. These characteristics are important inasmuch as a high carbon coal requires fine pulverization and a carefully designed furnace to maintain the high temperature until ignition is complete. And a low fusing ash will, when carried in suspension, cling to the tubes of the boilers, close up the flame space and make its operation impossible.



TEMPORARY ARRANGEMENT FOR BURNING POWDERED COAL UNDER 300-HP. BOILER. SHEET IRON BURNERS AND EXTENDED OVEN ARE SHOWN

To prepare this coal for burning it must first be thoroughly dried and the moisture content reduced to approximately 1 per cent before it can be properly pulverized. It must then be pulverized to powder form, where approximately 85 per cent will pass through a 200 mesh screen and 95 per cent through a 100 mesh screen if the best results are to be obtained. It should then be fed directly to the furnace, or if transportation or storage is necessary it should be kept air tight so far as possible to prevent absorption of moisture. The danger from explosion when handling this material is eliminated, if it is kept in bulk and not allowed to become suspended in a mixture of air. In the latter case a highly explosive atmosphere may be found which will readily ignite if brought in contact with a flame.

The method of experiment and results of test made by the Puget Sound Traction, Light & Power Company are as follows:

The coal is dried and pulverized by the Pacific Coast Coal Company at its briquetting plant, near Renton, which is equipped with a Raymond pulverizing plant. It is then loaded in a special car equipped for the purpose, which consists of a box car in which is constructed a metal-lined hopper. The car is spotted at the steam plant over a chute which is connected to the car by a flexible hose and which feeds a small conveyor encased in a metal housing. The coal is elevated and dumped into a bunker, adjoining the power plant, from the bottom of which it is fed by means of two motor-driven screws into the supply pipe. The coal is then blown through the pipe a distance of 30 ft. to the front of the furnace, where it feeds into specially constructed burners, made of sheet iron, as shown in the accompanying photograph. The air supply to each burner is furnished by a motor driven blower with dampers installed to control the supply. The boiler has been equipped with an extended oven, as shown in picture, in order to furnish sufficient space for the proper ignition and combustion of the fuel.

Results of Test

Duration of test	12.8 hrs.
Average boiler hp. developed	357
Total water evaporated	143,231 lb.
Average temperature of feed water	185 deg. F.
Average steam pressure	106.5 lb. gauge
Average temperature of steam	399 deg. F.
Average flue gas temperature	528 deg. F.
Average draft at uptake	0.17 in. water
Average flue gas analysis	CO_2 17 per cent; oxygen, 2 per cent; CO, 0 per cent
Total coal burned	18,389 lb.
Actual evaporation per lb. of coal	7.8 lb.
Equivalent evaporation from and at 212 deg	8.6 lb.
Boiler efficiency	71 per cent

Above is given a record of a test on the equipment run continuously for 12.8 hours, the duration of the test being determined by the limited facilities for storage and handling of the fuel. The coal was weighed in the car as delivered to the plant and the net weight determined by a subsequent weighing of the car after unloading. The test was run until all coal was consumed. The water was measured by a Venturi water meter installed in an individual feed line to the boiler and all instruments were checked for accuracy before starting. The test was made on a 300-hp. B. & W. boiler on March 23, 1917. The coal analysis is as follows: Moisture, 5.4; volatile, 37.2; fixed carb., 47; ash, 10.4; sulp., 0.56; B.t.u., 11,760.

The ash analysis is as follows: SiO_2, 44; FeO, 10.45; Al_2O_3, 32.88; CaO, 7.75; MgO, 2.40. The screen test gave 5.8 per cent on 100 mesh; 34.6 per cent through 100 on 200, and 59.6 per cent through 200.

It was noted during the test that the boiler could be forced to 200 per cent of rating without any apparent damage to brick setting or tubes. The stack was perfectly clear under these conditions, and there was no fusing of the ash. About one-third of the latter was found deposited in the second and third passes of the boiler. The results of the experiment tend to refute most of the adverse criticism of this method of burning coal. There was no formation of slag in the furnace or on the tubes; there was no shower of cinders and ashes emitted from the smoke stack and there was no damage done the boiler from heavy overload under these conditions.

From its experiments in burning these different fuels the company finds that (assuming pea coal at $1.60 per gross ton) the relative prices of the fuels at which it would have equivalent heating values are as follows:

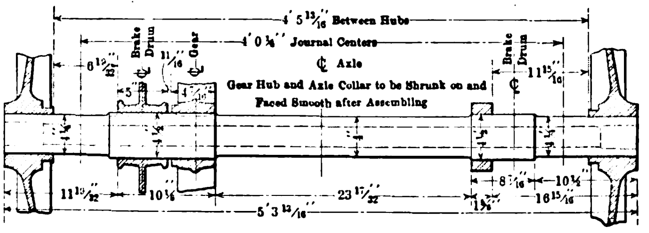
Pea coal on chain grates, at $1.60 per gross ton, delivered.
Fuel oil, at 56 cents per barrel, delivered.
Powdered coal, at $2.20 per gross ton, delivered.

That the powdered coal can be burned without physical difficulty is practically assured, and the company hopes that within a few months the success of its efforts will have been finally demonstrated.

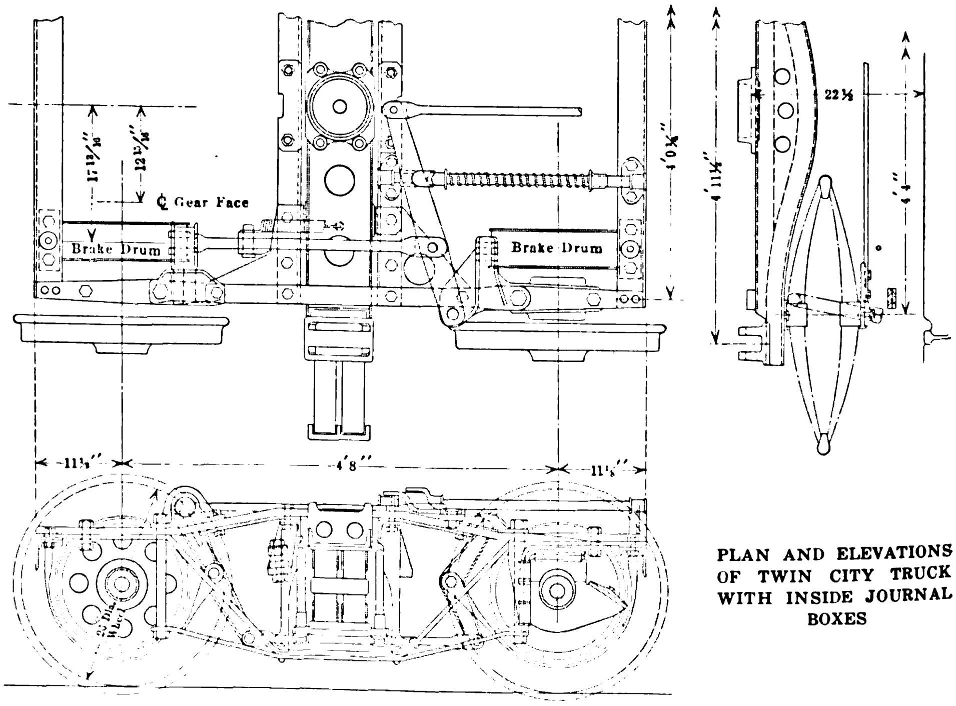
Novel Truck for City Service

This Design, Which Is Being Tried Out by the Twin City Rapid Transit Company, Has Inside Journals and Band Brakes

A novel form of truck for city service has been developed by W. J. Smith, master mechanic Twin City Rapid Transit Company, and has been placed in service on the new light-weight cars that are being tried out on that company's lines. The major features of the construction are inside journal boxes and band brakes, the principal object of the new design being to obtain lighter weight than is practicable where the journals and truck frames are outside of the wheels. By placing the frames between the wheels it becomes possible to use lighter axles, and in addition some of the cross members of the truck can be made shorter and of correspondingly decreased weight.



DETAIL OF AXLE FOR TWIN CITY TRUCK WITH INSIDE JOURNALS



PLAN AND ELEVATIONS OF TWIN CITY TRUCK WITH INSIDE JOURNAL BOXES

An idea of the construction may be obtained from the accompanying illustrations, of which one shows views of the assembled truck and the other a detailed drawing of the axle. From the former it will be observed that the single pedestal casting at each wheel interlocks with one side of the journal box casting. The idea of this construction is to leave one side of the journal box free from bolts and to give access for packing the journal box, whose oil cellar is accessible from the end of the truck and not from the side, as is customary. To provide for movement between the truck frame and the journal box a small amount of play between the interlocked members is permitted. There is a rubber pad on top of the journal box, and this, when compressed, permits the box to slide upward slightly along the pedestal casting, along one side of which it is interlocked.

From experience with the trucks under actual operating conditions Mr. Smith states that this design and location for the journal box appear to be satisfactory in every way. The elliptic springs, which are hung by relatively long links from the transoms and which furnish the sole support for the truck bolsters, are 32 in. long, the length being easily attained by extending the springs out between the wheels. Naturally, the riding qualities of the truck are good.

Band brakes instead of the customary brakeshoes are provided at either side just inside of each wheel, making eight brakes in all. These give a total contact surface of about 800 sq. in. In practice this brake has been found to be efficient, smooth and noiseless.

Complete with wheels and axles the weight of one truck is 3200 lb. The weight of one truck together with two motors and the necessary gear case, oil, grease, etc., to make it ready for operation is 5200 lb. The trucks, it may be said, are being operated under cars that are 9 ft. wide and 46 ft. long.

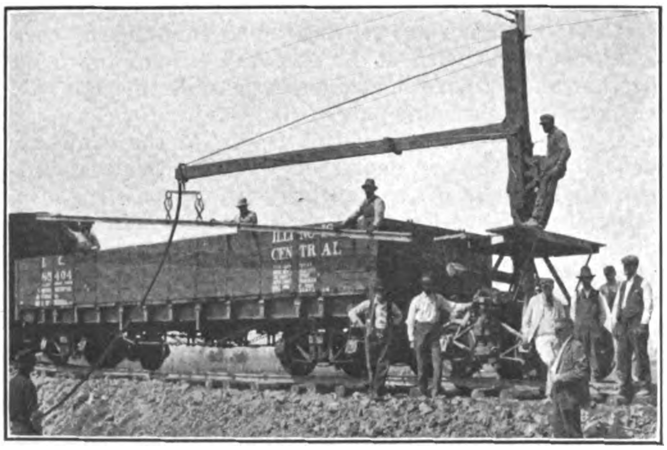
Twenty Men Lay ¾ Mile of Rail Per Day

BY T. W. SHELTON

General Superintendent, Kankakee & Urbana Traction Company, Urbana, Ill.

During the 1916 construction season the Kankakee & Urbana Traction Company built 6 miles of line between Ludlow and Paxton, the grading for which was done during the preceding fall. In this construction a rail-laying machine, designed by the writer, was employed. With this it was possible to unload rail from the car and lay it at the rate of ¾ mile a day with twenty men.

The machine consists of a gib crane mounted on an ordinary steam railroad freight car truck, braced in the manner shown in the accompanying illustration. The crane is hand operated from a platform placed high enough to permit the operator to see all details of the operation plainly. A drawbar and coupler mounted on the crane pillar provide for connecting the crane car to the rail car. The writer has been granted a patent on this machine.

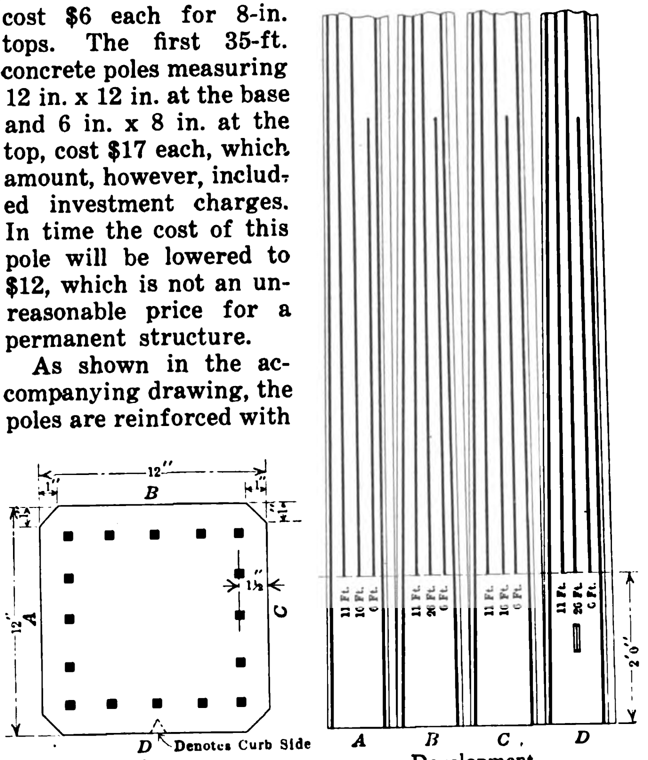


RAIL-LAYING PORTABLE CRANE USED ON KANKAKEE & URBANA TRACTION LINE

Home-Made Reinforced Concrete Poles at Richmond

During 1915, the Virginia Railway & Power Company began to manufacture reinforced concrete poles for situations where both permanence and a good-looking line are desirable. These poles are made in 30-ft. and 35-ft. sizes. They are used in place of Albemarle County chestnut which average twelve years of life (eight years minimum to twenty years maximum) and which cost $6 each for 8-in. tops. The first 35-ft. concrete poles measuring 12 in. x 12 in. at the base and 6 in. x 8 in. at the top, cost $17 each, which amount, however, included investment charges. In time the cost of this pole will be lowered to $12, which is not an unreasonable price for a permanent structure.

As shown in the accompanying drawing, the poles are reinforced with bars ½ in. in diameter, of several lengths, the bars being of Havemeyer upset type. Instead of using lag screws in fixtures, through bolts are used, the holes being cored during forming by means of paper tubes.

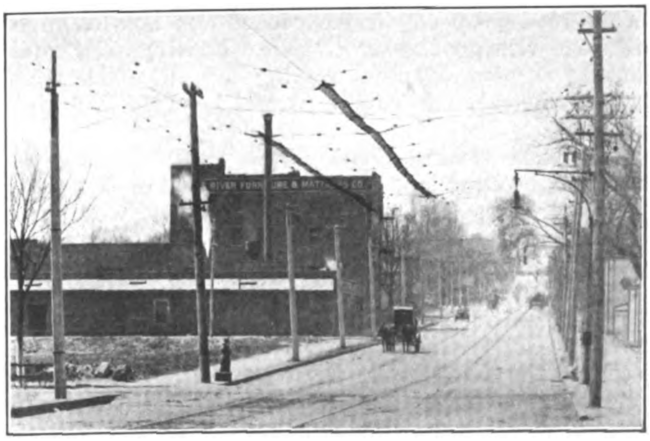


Plan

Development

DETAILS OF CONCRETE POLE REINFORCING

By March 22, 1917, the company had made up 100 35-ft. poles and forty-two 30-ft. poles at Richmond; also approximately the same number at Petersburg, from the



VIEW OF CONCRETE POLE INSTALLATION, RICHMOND, VA.

same forms. Norfolk has already made 200 35-ft. poles and a third hundred is under way. The company's present pole forms are of wood, but it is planned to make a more durable construction by using a combination of a concrete base and steel sides.

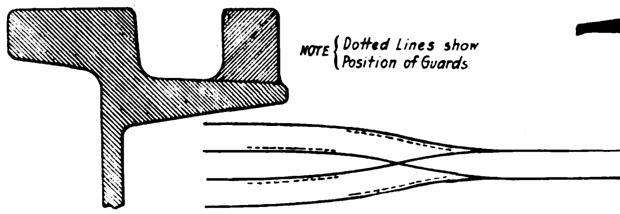
The accompanying illustration shows an installation of concrete poles in Richmond, Va., the poles shown being on Hull Street, between the James River and Seventh Street.

Guard for Tram Rail Made by Electric Welding

BY D. B. MOIST
Chief Engineer, Harrisburg (Pa.) Railways

This company is using 100-lb. tram rail and at a turnout, such as shown in the accompanying illustration, trouble was experienced with the pony wheels of maximum traction trucks leaving the rails. It was therefore decided that a guard was necesary, but instead of installing a separate guard rail, lengths of 1 in. x 1¼ in. mild bar steel were welded to the tram rail, as shown in the accompanying illustration.

A Lincoln welding machine was used, and two men welded the bar to the rail along the four sections in one day without interrupting traffic. Cars have been operating over this turnout for some time since the guards were welded on and no more derailments have occurred. By this means a considerable economy has been effected over the cost of material and labor which would have been necessary if we had had to purchase and install a regular guard rail.



GUARD RAIL WELDED ON TRAM RAIL; TURNOUT ON WHICH RAIL GUARDS WERE USED

Trolley Wheel News from San Francisco

The United Railroads of San Francisco, Cal., has recently changed from 4-in. to 6-in. trolley wheels, weighing 4¼ lb. new and 2 lb. scrapped. It is now making its own wheels, carefully finishing them on the sides to secure good balance. Case-hardened pins and bushings are used with good results. Seven bushings are made out of 1 ft. of steel tubing costing 35 cents, aside from drilling and case-hardening. A test gave the following results.

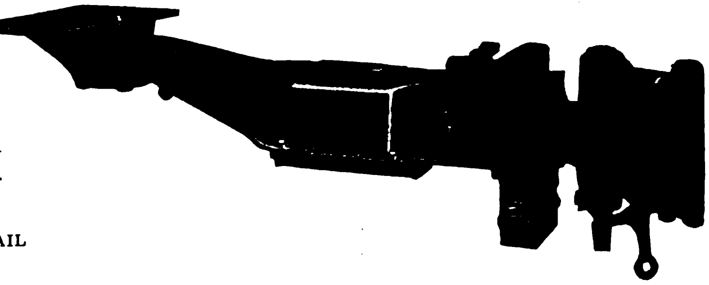
Cold-rolled case-hardened steel pin and case-hardened bushing and wheel installed July 28, 1916, wheel worn out Sept. 4, 1916; second wheel with same pin and bushing installed Sept. 17, 1916, worn out Nov. 4, 1916; third wheel with same bushing but with a tool-steel pin installed Jan. 27, 1917, worn out March 20, 1917; fourth wheel with same bushing and pin installed March 27, 1917, and in use to date. These wheels are used on the San Mateo high-speed interurban cars weighing 76,000 lb. and equipped with four GE-73 motors. The trolley wheel tension is 30 lb.

The trolley base is U. S. No. 6, which has been remodeled by the use of three springs in tandem instead of two.

New M. C. B. Coupler for Interurban Service

A new coupler designed by the Van Dorn Coupler Company, Chicago, Ill., has been brought out to meet the increasing demand which the electric railway companies are facing of interchanging freight equipment with the standard M. C. B. couplers installed on all steam road cars. This new coupler satisfies this requirement and has an added advantage over the standard M. C. B. coupler in that it will permit the operation of cars in trains through city streets where there may be short-radius curves and abrupt changes in grades.

Some of the special features of this new coupler tend to facilitate its use on electric railway systems. The guard arm extending out on the horn side of the coupler and the butting wall on the opposite side and just to the rear of the knuckle produce a "gathering-in" range of several inches more than is found on the usual coupler, and this greatly facilitates coupling on curves. This also helps to align the couplers so that the lock will drop and prevent the knuckles from buckling into the 13 deg. offset of the M. C. B. contour. The coupler shank extends into the forward end of the draft housing and is connected to the spring yoke by means of a 2-in. round pin which extends through to both sides of the yoke and protrudes outside of the draft-gear housing. The coupler head pivots vertically on this pin and is held in alignment by means of a triple head-support which is located in the casing at the forward end of the draft housing. This head-support is so constructed that it adjusts the wear plate upon which the coupler rests to conform to any position of the coupler and thus brings the same bearing area into play at all times. This pivoting of the coupler head permits the couplers to assume the most natural angle and thus allows the knuckles to slide freely the necessary distance, whenever a train of cars is operated over any abrupt change in grade. This freedom from binding relieves the car platforms of abnormal strains. The coupling of cars on uneven tracks without the necessity of bumping them together unduly hard is also made possible through this arrangement, since only part of the weight of the coupler head, instead of the usual full weight of the drawbar, needs to be lifted or depressed in order to produce a vertical alignment of the knuckles.



NEW M. C. B. COUPLER SUITABLE FOR INTERURBAN AND CITY SERVICE

One of the features of this coupler is the construction which gives it a positive lock and at the same time provides that it remain always in the unlocked position even with the knuckle closed, so that trainmen are relieved of the necessity of holding on to the uncoupling rod during the process of uncoupling. The knuckle is thrown wide open upon lifting the lock 4⅝ in.

The coupler carrier is connected with a radial bar and supports the draft-gear housing at its forward end by means of a sliding connection. The couplers are equipped with the Hercules spring draft gear which automatically absorbs the slack between cars of a train.

News of Electric Railways

Traffic and Transportation
Financial and Corporate Personal Mention Construction News

Progress in Chicago Situation

City Council Has Taken Several Necessary Preliminary Steps Toward Carrying Out the Traction and Subway Commission Plan

Since the presentation of the Chicago Traction & Subway Commission report early in December, the local transportation committee of the City Council has been almost constantly at work studying the plan recommended by the commission and holding public hearings on it, looking toward the preparation of suitable bills for approval by the Council which could then be sent to the State Legislature for passage. While considerable delay has been brought about by the Socialists and the municipal ownership propagandists in the consideration of these bills, the Council has finally approved bills embodying the principal legislation needed.

On May 9 the Council indorsed, almost unanimously, a so-called "home-rule" bill which is modeled after the State public utilities act and transfers to the City Council the control over service and rates which is now held by the utilities commission. Control over the issuance of securities will, however, still be retained by the commission. The bill if passed will give the city the right to appoint a board of control or commission to carry on the work of regulation. At the last minute an amendment was read into the bill through which the City Council retains the right to recall a member of the commission. Similar bills introduced at previous sessions of the Legislature were lost principally because of the objections from steam railroads and suburban towns surrounding Chicago.

Under the present proposed bill, however, the State Utilities Commission would have authority over any through lines and the local board of control would have jurisdiction over local service and rates. There is still considerable opposition to this bill in the State Assembly, and if it fails in passing it is thought that a home-rule clause will be inserted in the franchise bill which has also been sent to the Legislature on approval of the City Council. If the measure meets with failure here, it will probably mean an end to the whole plan, at least for two years, or until the next session of the Legislature, since practically all other enabling legislation hinges upon local control of the transportation systems. The present Legislature will probably adjourn on June 15.

MERGER BILL APPROVED

A bill providing for the merger of the elevated and the surface lines in Chicago was also approved on May 9 by the City Council, as part of the program outlined by the traction and subway commission. Should this merger bill pass the Legislature and the unification be brought about, it would combine 1049 miles of surface lines and 162 miles of elevated railroad. The purchase price of the surface lines is $451,650,000, while that of the elevated system, according to the traction and subway commission's evaluation, is $70,400,000. This bill permits the consolidation of street railways and a "local railroad," the latter name having been adopted to differentiate between the elevated and steam railroads. One feature of the bill is a clause which provides that any stockholder who does not acquiesce in the consolidation scheme may file a court petition stating his disapproval, and that he shall become obliged to sell his holdings to the new corporation at a price fixed by the court. The vote of the City Council approving this merger bill was fifty-one to fifteen.

FRANCHISE BILL APPROVED

The traction and subway commission report recommended the adoption of an indeterminate franchise, but this was attacked, principally on the ground that it was virtually a perpetual franchise. In the commission's report it was pointed out that this type of franchise, granting as it did the right to use the city streets as long as the company complied with the requirements of good service which might be dictated by a board of control, could never be gained until the State constitution was so amended as to give the city the financial ability to exercise its right to take over the transportation systems. Until it has that right, the city will be without means of enforcing regulatory measures.

STRAIGHT THIRTY-YEAR FRANCHISE APPROVED

The commissioners and railway officials thought that a fifty-year franchise was necessary in order to carry out the construction program. It was impossible, however, to get much consideration from the Aldermen for a franchise of this term at the present time. Several weeks ago the Council voted down a thirty-twenty-year franchise bill which provided that the city could take over the property at any time upon paying the agreed purchase price, or could take it over at the end of thirty years without paying the full price but by assuring interest payment on the unamortized portion of the investment. This was objected to as a fifty-year franchise in disguise. Finally, on May 9, a straight thirty-year franchise bill was approved by a vote of forty-three to twenty-four and sent to the State Legislature, the city not having the right to grant a franchise in excess of twenty years. This franchise bill is made inapplicable to other cities in the State. The bill allows the city to take over the transportation companies at any time on the payment of the purchase price, and also provides for amortization of the investment. It further provides that at the end of thirty years, the city may take over the property subject to a lien on the earnings which are to be used for the payment of interest on outstanding securities, but the city shall not assume to pay the principal thereof. It is expected that the earnings of the property will be great enough to pay interest on the securities and provide for the amortization fund, so that in another twenty years beyond the thirty-year franchise period the city would automatically acquire full title to the property.

In order to remove the doubt expressed by counsel as to the right of the city to construct and own subways, a bill covering this matter was approved by the City Council on May 9 for transmittal to the State Legislature.

All bills recommended to the Legislature in connection with the traction program contemplate that no ordinance in connection with them shall go into effect until after a referendum vote at some regular or special election. If the whole program is passed by the State Legislature, and the ordinances are drawn up and agreed upon, popular approval will be sought at the November election this year or the April, 1918, election.

FURTHER PROGRESS DEPENDS UPON LEGISLATURE

Further progress in the solution of the Chicago traction situation now depends on the action of the Legislature. With passage of the proposed bills, the bigger problem of drafting a working ordinance still remains to be done. Many of the Aldermen have approved the present bills with the understanding that in the formulation of the ordinance there will be opportunity for further hearing and working out of many objectionable points. With the railway men favoring consolidation and believing that the financing may be accomplished on a thirty-year franchise grant provided the present construction expenditure outlined by the traction and subway commission is rearranged, or at least is not increased for the first period of the program, it is possible that a settlement may be reached in another year.

Middlesex Wage Decision

Arbitrators Who Considered Wages on Middlesex & Boston Street Railway Praise Company Management

The arbitration committee appointed to consider the matter of wages for the employees of the Middlesex & Boston Street Railway, which operates 130 miles of line in Massachusetts, has reported its finding. The board recommends an increase of approximately 10 per cent in the wages of the trainmen of the company and a proportionate increase in the wages paid to carhouse men and other employees. Among the other questions which the board had before it for settlement was whether the award should terminate on July 1, 1919, or on some date before that time. On this point the board ruled that the award shall terminate on July 1, 1919.

CONTENTIONS OF MEN AND COMPANY

The contention of the men before the arbitration board was that the wages should be increased to the same extent that the cost of living has increased since the last award, which was on June 23, 1914. The company contended that the wages should not be increased at this time because (a) its financial condition was such that any increase would prevent the payment of dividends to stockholders and impair the ability of the company to make necessary expenditures for maintenance, and (b) the increase in the cost of living since the last award was due in part to extraordinary and temporary conditions resulting from the war.

As regards the objection of the company the board expressed the opinion that the limitation upon the income of the employer in this instance was one largely within the control of the Public Service Commission. It stated that obviously public interest required a continuation of the public service rendered by the railway and that continuation of this public service ought not to be allowed to go on at a loss either to the owners or to the operatives. The board said further that the most careful scrutiny of the history, organization and management of the company had convinced it that the company was and had been most economically and efficiently managed and had been extremely conservative in the payment of salaries to executives. It was also clear beyond the slightest doubt that the present straightened financial condition of the company was not due in any measure to extravagance or lack of efficiency. On this point the board said: "It does not seem possible that any company could be better or more thriftily conducted."

The board also expressed its appreciation of the proposition of the company that the stockholders were entitled to dividends which should represent a living wage for their invested capital. The board said that the necessity was immediate and insistent for providing public service corporations with means to pay adequate wages to men upon whose continued employment and experience safe operation depended. In this connection the board said: "In establishing what we believe to be a no more than adequate scale of wages, we have in mind the declarations of the Public Service Commission in the Middlesex & Boston rate case, and we earnestly emphasize our conviction that it is essential that relief be granted to the company."

WHAT THE NEW SCALE MEANS

At present the weighted average wage of the blue uniform men amounts to 27.986 cents an hour. The board said that an increase of 9.311 per cent would produce a weighted average wage of 30.592 an hour, or an increase of 2.606 cents per hour. Applying the factor 9.311 to the present wage scale and using as a basis the conditions as to employment as they existed in the year 1916-1917, the scale for the year which will end July 1, 1917, is as follows: first year, 26 cents; second year, 28 cents; third year, 30 cents; fourth year, 32 cents; fifth year, 33 cents. For the period which ends July 1, 1918, the award is as follows: first year, 27 cents; second year, 29 cents; third year, 31 cents; fourth year, 33 cents; fifth year, 34 cents. For the third period, that which will end on July 1, 1919, the schedule adopted is as follows: first year, 27.5 cents; second year, 29.5 cents; third year, 31.5 cents; fourth year. 33.5 cents; fifth year, 34.5 cents.

The board said that the same reason which dictated an increase in the rate of wages made to the blue uniform men also required a proportionate increase in the wages made to the carhouse men and other employees. The board found, however, that it was not practicable to adopt a graduated scale for carhouse men and other employees and established schedules for these men proportionate to those granted to the trainmen. The present rate of pay for carhouse and other miscellaneous employees exclusive of trackmen and track oilers ranges from 20 to 35 cents an hour. The award raises the foregoing to maxima of 23 and 40 cents an hour for the 1918-1919 period. Trackmen receive from 25 to 29 cents an hour at present and are to receive 28.75 to 33.5 cents maximum under the award. Track oilers, receiving 20 to 25 cents, will be increased in the final year to 23 to 28.75 cents. The board held that the financial condition of the company is such that it ought not to pay for any unnecessary time, in passing upon the question whether all regular runs should pay at least nine hours' wages. Moreover, the practical difficulty which rendered it inadvisable to grant a graduated scale of wages for carhouse men and other employees also rendered it undesirable to establish a minimum wage for such employees.

COMPANY REPRESENTATIVE DISSENTS

A minority report by A. A. Ballantine, on behalf of the company, dissented from the wage increase because the award raises the wages beyond the ability of the company to pay. Experience since the award of 1914 showed that despite the increase of fares granted by the Public Service Commission the additional revenue had been insufficient to pay the increased wages and expenses of the company and maintain the former 4 per cent return on its stock. For the year ended June 30, 1916, the dividend had to be reduced to 3.25 per cent. The award now made for the current year wiped out more than half the amount needed to maintain even that insufficient rate. Even if the Public Service Commission allowed the company to increase its charges it was doubtful whether the company could secure from its business under present conditions revenue sufficient to meet its expenses, including wages at the rates now prescribed, and permit anything like a fair return upon the investment.

The award was signed by Henry C. Sawyer, chairman, and James H. Vahey, representing a majority of the board.

Rails Removed at Night

Four blocks of rails of the double-track street railway on McGee Street, Kansas City, Mo., were torn up between midnight and 6 o'clock of the morning of April 10, by a squad of workmen commanded by Fred A. Richardson, street commissioner. Mr. Richardson was acting under written instructions from Mayor Edwards. The plan of rerouting cars which have used this street will now be put into effect according to a routing ordinance passed several months ago. The night removal of the rails was planned to avoid the securing of an injunction by business men who opposed traffic being diminished on this thoroughfare.

The city and the Kansas City Railways had agreed some time ago on the removal of the tracks in the four blocks and on the rerouting of cars, involving the construction of a short track and new curves. The Kansas City Railways last November began the work of removing the rails, but was stopped by an injunction issued by the Circuit Court of the county. The injunction read against "The Kansas City Railways and John Doe."

The Kansas City Railways has been held in contempt of court for its alleged part in tearing up the McGee Street tracks and has been ordered to replace the tracks within sixty days. The court withheld action on the motion to cite Mayor Edwards for contempt. The judge intimated, however, that the disposition of the Mayor's case would depend largely on his activity in assisting the railway in replacing the tracks. It was shown that there had been conferences between the railway officials and the city, presumably on the subject of the track removal. The court found that the contractor who assisted was in the position of an agent of the company; that the cars were routed elsewhere after the tearing-up began, and that the company furnished a work car. The company will appeal to a higher court.

Strike on I. U. T. Line

Brotherhoods Fail in Attempt to Tie Up Lines of the Indiana Union Traction Company

Efforts on the part of the Brotherhood of Locomotive Engineers and the Order of Railway Conductors to organize the trainmen of the Union Traction Company of Indiana, which have been in progress for several weeks past, resulted in about thirty-six interurban trainmen walking out on Sunday morning, May 13, in response to a strike call made by the brotherhoods. About 200 trainmen refused to respond to the call, so that while the schedules on some divisions were affected for a time the interruption to service was not serious. The schedules of the main lines of the company, operating out of Indianapolis to Anderson, Muncie, Newcastle, Kokomo, etc., were maintained, and extra train service was provided between Indianapolis and Fort Benjamin Harrison, where the training camp of the officers' reserve corps is established.

The employees of the city lines of the Union Traction Company in Anderson, Marion and Muncie were not affected by the strike. In these cities, however, mass meetings were planned for May 14 to try to arouse sympathy for the striking trainmen, and full-page advertisements were inserted in the principal newspapers submitting the case of the employees to the people.

Contention of the Brotherhood

The brotherhoods claim that the present trouble arises from the discharge of interurban trainmen of the Union Traction Company in March, 1917, on account of their activity in attempting to induce other employees to affiliate with the Order of Railway Conductors and the Brotherhood of Locomotive Engineers. An attempt was made early in April by officers of the two brotherhoods to confer with H. A. Nicholl, general manager of the company, but Mr. Nicholl declined to concede the right of the brotherhoods to represent the discharged employees and refused to meet them. The brotherhood officers then submitted the matter to W. L. Chambers, Commissioner of the United States Board of Mediation and Conciliation. They asked for mediation under the Newlands act, and stated their reluctance to distribute strike ballots in view of the published policy of the National Council of Defense.

On April 11 Judge Chambers conferred with F. A. Burgess and T. A. Gregg, representing the brotherhoods, and also with Arthur W. Brady, president of the Union Traction Company of Indiana, but was unable to bring about any joint conference. Judge Chambers notified the brotherhood officers that Mr. Brady declined to meet them on the ground that his company did not recognize organized labor and he saw no reason to change its policy.

President Brady States Company's Case

Mr. Brady wrote to Judge Chambers on April 13 confirming an offer which he had made at their conference, that on individual application by any of the discharged motormen and conductors the causes of their discharge would be reviewed by Mr. Nicholl, general manager, or Mr. Brady, or both, and if any of the men should not be reinstated, Mr. Brady would then take under consideration the question of submitting the case to arbitration in the manner provided by the Newlands mediation act of July 15, 1913. Mr. Brady then called attention to the fact that twenty-four trainmen were discharged early in March and that no request for a review of their cases had been made by any of the discharged men or by their fellow employees, nor had any committee of employees presented any statement of grievances. He said, however, that on April 12 a paper was circulated among all the interurban trainmen to ascertain their views as to desirability of membership in the two brotherhoods. This was signed by 216 of the men. Eighty per cent of the men went on record as against any change of working relations with the company, and only two men did not sign the paper.

The controversy was the subject of considerable discussion and correspondence between W. L. Chambers and Daniel Willard, president, and Walter S. Gifford, director, of the National Council of Defense, and L. S. Storrs, president of the American Electric Railway Association, and was referred in a communication to Newton D. Baker, Secretary of War, in an attempt to remove any misunderstanding of the statement of the National Council of Defense when it advised "that neither employers nor employees shall endeavor to take advantage of the country's necessities to change existing standards."

On May 2 Judge Chambers wrote to Mr. Brady, renewing the offer of the Board of Mediation and Conciliation to arbitrate the differences between the discharged men and the company. Mr. Brady replied on May 4, expressing his appreciation of the courtesies extended, and closed by saying: "Our relations with our employees remain cordial and satisfactory and events since your trip to Indiana convince me that the instruments signed at that time by practically all our motormen and conductors express their genuine and sincere sentiments and intentions. Further agitation of the subject cannot be in the public interest and is manifestly undesired by our employees."

On May 12 T. A. Gregg, vice-president of the Order of Conductors, and F. A. Burgess, assistant grand chief of the Brotherhood of Locomotive Engineers, in a communication to Mr. Brady announced that, having failed to reach an amicable adjustment of the differences, a strike would become effective at 4 a. m. on May 13.

On May 15 officials of the Union Traction Company notified the striking trainmen that they must apply individually for reinstatement before noon on May 16 in order to receive consideration. The superintendent at Marion announced on the evening of May 16 that sixteen men reported for work under the company's conditions. Other striking trainmen declared they would hold out for recognition as members of brotherhoods and stated that there were no further desertions from their ranks. The company reports that practically regular schedules are being operated on the system and that all passenger and freight schedules were normal on May 18.

Preparing for Cincinnati Work

A partial organization of the working force to prepare plans and specifications for the proposed rapid-transit loop at Cincinnati, Ohio, was effected at a meeting of the Rapid Transit Commission on April 4. Frank L. Raschig was appointed principal assistant engineer at a salary of $5,000 a year, while J. R. Biedinger, F. F. McMinn and P. R. Kirstein were appointed designing engineers at salaries ranging from $2,100 to $2,400 a year. H. C. Kleemeier was appointed assistant engineer and W. C. Boone was appointed draftsman. All these men were associated with Frank S. Krug, chief engineer, in his office as city engineer. Departments will be combined and their places will not be filled in the city office for the present.

The commission has approved the answer to the petition of David S. Oliver, who as a taxpayer recently brought an injunction suit against the city and the commission to prevent the construction of the loop. The answer of the commission will be filed in court at once. The commission denies all the allegations contained in the plaintiff's petition.

Mayor to Supervise Fare and Transfer Problem

At a conference on May 9, in which the members of the Rapid Transit Commission, Mayor Puchta, City Solicitor Groom, Chief Engineer Frank S. Krug and former Mayor Frederick S. Spiegel took part, it was decided that the Mayor should have supervision over the fare and transfer question and pending and proposed construction of the surface lines. The members of the Rapid Transit Commission are to devote their attention wholly to the construction of the rapid transit loop. Mayor Puchta has been authorized to ascertain the course to be followed in making an appropriation for the payment of a street railway commissioner. Until this is done no commissioner will be appointed.

In connection with the proposed universal transfer system, which was intended to go into effect on May 15, Mayor Puchta stated that he would have authority to amend the schedule after it is approved, if found necessary. It must provide for transportation from one point to another by the shortest possible route at a fare of 5 cents. The 5-cent fare on the Millcreek Valley route, under the provisions of the new franchise, was to have gone into effect on May 15.

Municipal Men Get Increase

At a conference of the Mayor and city officials of San Francisco, Cal., on April 27, it was unanimously voted to increase the pay of all car and platform men, trackmen and repairmen of the San Francisco Municipal Railway 5 cents an hour, or 40 cents a day. The conference was presided over by Supervisor Wolfe and was participated in by Mayor James Rolph, Jr., President Reardon of the Board of Public Works, Superintendent T. A. Cashin of the Municipal Railway, and members of the committees on finance and public utility of the Board of Supervisors. The decision was expressly based upon two grounds, first that it is now virtually impossible for a workingman to live in San Francisco on a wage of $3 a day; and second, that the municipal railway of San Francisco has proved such a financial success that there is no plausible reason for denying a living wage to its employees.

On May 7 the Board of Works passed a resolution recommending that the employees of the municipal street railway receive an increase in pay of 50 cents a day. The question was then referred to the Board of Supervisors' finance committee.

Superintendent Cashin explained that the proposed wage increase will amount to about $93,000 a year. Originally he figured on an increase of 5 cents an hour, which for an eight-hour day would amount to 40 cents a day. This he estimated would cost $78,000 a year. President Reardon of the Board of Works said that whether this money shall come by reduction of the 18 per cent of the gross earnings that have been set aside for depreciation, redemptions and bonds, or out of the tax levy, is a matter for the Supervisors to decide.

Wage Increase in Chattanooga.

The trainmen in the employ of the Chattanooga Railway & Light Company, which operates in the city and vicinity, asked for an increase in wages of 1 cent an hour. The present minimum is 19 cents and the maximum 26 cents for the fifth year. On Oct. 7, 1916, the company made a new working agreement with its men to be effective for one and one-half years. This agreement was on the open-shop basis. Arbitration was provided as a means of adjusting wages only in the event the company did not increase the wages prior to April 7, 1917, or within six months of the date of signing the new agreement. Prior to April 1 an advance of 1 cent an hour was announced by the company. The men were not satisfied with this increase and demanded arbitration. This was declined by the company in view of the fact that the advance was made within six months of the execution of the agreement, thus complying in full with the statement and terms of the agreement. The company has notified its employees that they will receive another increase as soon as the earnings justify it.

Negotiations Continued at East St. Louis.—The conferences between the officers of the East St. Louis & Suburban Railway, East St. Louis, Ill., and the trainmen of the company over the working conditions of a new contract to take the place of the one that expired on May 1 were still being held on May 17.

Strike on Cincinnati Interurban Line Settled.—The motormen and conductors on the Cincinnati, Georgetown & Portsmouth Railway returned to work on May 11 after the company had signed an agreement recognizing the union and reinstating the president of the local branch of the union. The strike lasted about a week.

Strike in McAlester Ended.—The strike of motormen and conductors on the Pittsburg County Railway, McAlester, Okla., has been ended and the men have returned to work. The trainmen demanded a wage increase of 4 cents an hour, and the company offered an advance of 2 cents. A compromise was reached on an advance of 3 cents an hour for all motormen and conductors.

State Mediators Called.—George F. Miles and Ralph Maxwell, State mediators, went to Alliance, Ohio, on May 10 to aid in the settlement of a strike of motormen and conductors on the Stark Electric Railroad and the Cleveland, Alliance & Mahoning Valley Railway. The men quit work on the refusal of the company to increase their wages 5 cents an hour and recognize their union. They had been out several days when the mediators interceded.

Rhode Island Valuation Report Presented to State.—The special State committee appointed to investigate the financial affairs of the Rhode Island Company has held a conference with the federal trustees in charge of that property, and has received from them a complete report on the valuation of the company's physical plant, taken during the past few months by the company. Chairman Zenas W. Bliss states that this report will be the basis of the State investigation. The contents of the report have not yet been made public. The formal hearings have not been scheduled.

Utah Interurban Men Seek Increase.—The trainmen in the service of the Ogden, Logan & Idaho Railway, Ogden, Utah, have a contract with the company which expired on May 15. Their pay under this contract has been 25 cents an hour for the first two years, 27½ cents for the next two and 30 cents after four years. The men are seeking an advance over these rates. They have granted William H. Whitney, the new general manager of the company, an additional four weeks in which to reply to their request.

Wage Increase Without Change of Contract.—On account of the increased cost of living, the Aurora, Plainfield & Joliet Railway, Joliet, Ill., has voluntarily decided to pay all trainmen an additional 2 cents per-hour wage, until further notice. This increase is not to affect the terms of the company's contract with the men, which runs until July 31, 1918, and the company reserves the right to resume the wage scale provided in the contract at any time. Carhouse men, trackmen, linemen, substation men, dispatchers, agents, and office and park employees have also received an increase in proportion to the trainmen.

New Working Agreement in Salt Lake City.—Articles covering a new labor agreement between the Utah Light & Traction Company, Salt Lake City, Utah, and employees were agreed to recently at the conclusion of a conference of several days between H. F. Dicke, general manager of the company, and a committee of seven, representing all the trades in the company's service. It is stated that the new contract does not differ materially in its terms from the old one, but that the conditions which in future will govern the relations of the men and the company will not be made public until the agreement has been ratified by the men.

Full Service in South Bend.—Full operation of cars continues without interruption on the lines of the Chicago, South Bend & Northern Indiana Railway in South Bend. Governor Goodrich advised the union officials that the company had informed him in a letter from General Manager Hardy that the men had received an opportunity to return to work; that all schedules and lines were in operation, and that the company could not accept the offices of any board of arbitration. Therefore he could not appoint such a board. A delegation of the strikers called on the Governor late on the afternoon of May 16, however, and again urged the appointment of a board of conciliation.

Increase in Wages in Los Angeles.—Howard Huntington, general manager of the Los Angeles (Cal.) Railway Corporation, on May 4 ordered the pay of the trainmen raised approximately 7½ per cent, the raise to be effective immediately. This raise will increase the company's payroll $120,000 a year and was made because of the increase in living cost. In addition to the present 7½ per cent increase it was announced that an additional increase of 7½ per cent will be paid the men if the jitney bus competition is curbed. This additional raise will, if the railway men are successful in their initiative petition against the jitneys, mentioned previously in the ELECTRIC RAILWAY JOURNAL, mean an additional expense of $120,000 annually to the company.

Tripper Arbitration for New York State Railways.—Resort will be had to arbitration to settle the differences between the New York State Railways, Syracuse, Utica and Rochester lines, and the Amalgamated Association of Street & Electric Railway Employees in the matter of adjusting the tripper scale of pay on those lines. Under present conditions, union officials say these men are able to put in not more than six hours daily. They have asked that all time under six hours and over four hours be rated at six hours, and all time over six hours and under nine hours be rated as a full day. It is understood that the Amalgamated men have submitted the name of their arbitrator to the railway officials and that the entire mediation committee will be announced and a hearing held soon.

Suit for Failure to Pave Right-of-Way.—The Commissioners of Franklin County, Ohio, have filed suit against the Columbus Railway, Power & Light Company for $230,000 damages, because of the alleged refusal of the company to pave its right-of-way on Harbor Road. The petition alleges that the county must do the work at a cost of $180,000 and that because of this refusal the contractor now refuses to do the county's share at the original figures and the county will be compelled to pay $25,000 more on account of the increase in the price of materials. In addition it is claimed that property owners suffered damage to the extent of $25,000 because of the delay. The company's franchise will expire in June and it declared that if a new franchise was not granted it would be compelled to remove the Westerville track and discontinue service.

Increase in Wages in Seattle.—For the second time this year the wages of the trainmen in the employ of the Seattle division of the Puget Sound Traction, Light & Power Company have been raised, and the increase has been made retroactive. Last January, when the company announced an increase of 1 cent an hour, it was stated that another increase of 1 cent an hour would be put into effect on July 1 of this year. The recent order, however, makes the promised increase take effect on May 1. Two other changes are made that were not contemplated in the order of Jan. 1. Trainmen while breaking in students will receive henceforth 2½ cents an hour extra, whereas the extra pay of men serving as instructors has been 1 cent an hour. Hitherto the newly employed trainmen have been receiving a minimum wage of $55 a month. Hereafter the lowest wage paid by the company to its trainmen will be $65 a month. The increase in pay now in effect will add about $43,000 annually to the operating expense of the company. Speaking of the increase in wages, G. A. Richardson, general superintendent of railways, said, "The changes are made at this time on account of the increased cost of living, caused by war conditions, which were not anticipated when the order of January was posted."

Programs of Association Meetings

Iowa Electric Railway Association

The annual convention of the Iowa Electric Railway Association, arranged to be held at Des Moines, Iowa, on May 24 and 25, has been postponed for a year.

Illinois Electric Railway Association

The regular meeting of the Illinois Electric Railway Association which was to have been held on May 18 in Chicago was called off owing to the present uncertain conditions.

American Society of Mechanical Engineers

The spring meeting of the American Society of Mechanical Engineers will be held in Cincinnati, Ohio, May 21 to 24. The program reveals two important features of this meeting—sessions on munitions manufacture and a joint session with the National Machine Tool Builders' Association.

New England Street Railway Club

For the next regular meeting of the New England Street Railway Club at the Hotel Brunswick, Boston, Mass., on May 24 the principal speaker of the evening will be Charles F. Weed, president of the Boston Chamber of Commerce, Boston, Mass. Mr. Weed is vice-chairman of the executive committee of the committee on public safety, and has made a thorough study of the needs of the country under war conditions. His subject will be "New England's Part in Preparedness." There will also be heard a few words from some of the distinguished military and naval men, who will be present as guests.

Financial and Corporate

The War and the Utilities

Decline in Security Prices Causes Comment—Increased Fare Proposals Should Serve to Reassure Holders

With respect to the prices of public utility and other investment securities, the times are sadly out of joint, as Shakespeare has said,—so sadly so that at the time this was written the quotations of many of the standard utility and railroad issues dealt in on the exchanges were at or below the levels reached in the panic of 1907. The liquidation of high-class investment issues Boersianer in the Chicago *American* ascribes to the fear of imprudent economic legislation. According to him investors preferred to exchange their holdings for what Disraeli called the "sweet simplicity of the 3½ per cents."

Managers are interested in the subject of the effect on their credit caused by an era of decline in security prices such as the present, and one of them, Samuel Insull of the Commonwealth Edison Company, Chicago, has raised his voice in behalf of the utilities. He says that the depression in prices is unwarranted. While he admits that expenses are high, in speaking more particularly about the Commonwealth Edison Company, the People's Gas Company, the Public Service Company and the Middle West Utilities Company, he says they are by no means so extreme as to have warranted the depreciation in the price of the general run of utility securities. Another authority has urged the holders of utility stock to retain their securities as it is only a question of time when the situation will right itself.

All connected with the industry should take their cue from the recent remarks of President Sullivan of the Bay State Street Railway and do what they can to drive home the imperative need of the service which they render. Many electric light, power and gas companies already have wonderful merchandising organizations, but for the vast majority of these companies only the surface of business has been scratched. There is nothing spectacular in prospect for the holders of the securities of such companies, but there is something much more important in view from the standpoint of the conservative investor—a steady, consistent increase in business which has back of it a real need on the part of the general public.

What intensive merchandising methods can accomplish for the electric railway, however, is still an unsettled problem. Earnings of utilities are unusually stable, irrespective of whether financial conditions are good or bad. This applies in a large measure to the electric railways as well as other utilities, but the electric railways are handicapped as compared with the electric light, power and gas companies because they do not respond in anything like a similar ratio to quickened commercial activity.

While the declines in the prices of many issues dealt in on the exchanges have called for comment from Mr. Insull and others, investment houses that specialize in utility issues report no undue liquidation. This is true not only in New York, but in New England and in other centers where such issues are disposed of direct to the public over the counter. The utilities have on the whole built well for the future, and with a return to normal of many things that enter into their operation the increases in gross that many of the combined railway and lighting companies are enjoying and are likely to continue to enjoy will loom large.

There is no mistaking the fact, however, that many electric railways are finding it increasingly difficult to make ends meet. Relief has already been granted by the regulating bodies in a number of cases, and applications are under way for other measures that will serve to augment the earnings of these companies without being unduly burdensome to the users of the service. These efforts should serve not to quicken liquidation, but to reassure holders of securities that their interests are being carefully safeguarded.

Annual Reports

Hudson & Manhattan Railroad

The comparative income statement of the Hudson & Manhattan Railroad, New York, N. Y., for the two years ended Dec. 31, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Passenger revenues	$3,822,578	93.6	$3,477,695	93.3
Miscellaneous revenues from railroad operations	262,270	6.4	248,294	6.7
Total railroad revenue	$4,084,848	100.0	$3,725,989	100.0
Maintenance of way and structures	$268,061	6.5	$269.424	7.2
Maintenance of equipment	219.179	5.4	179.676	4.8
Power	275.986	6.8	243,509	6.5
Transportation expenses	679,464	16.6	615,303	16.5
Traffic expenses	3,308	0.1	1,110	0.6
General expenses	176,636	4.3	147,574	4.0
Total railroad operating expenses	$1,622,634	39.7	$1.456.596	39.1
Net railroad operating revenue	$2,462,214	60.3	$2.269,393	60.9
Railroad taxes	293,610	7.1	272,237	7.3
Net railroad income	$2,168.604	53.2	$1.997,156	53.6
Net income from outside operations	918.077	22.5	982,627	26.4
Total operating income	$3,086,681	75.7	$2,979,783	80.0
Non-operating income	55,398	1.3	43.111	1.1
Gross income	$3,142,079	77.0	$3,022.895	81.1
Income deductions prior to bond interest	264,582	6.5	243,765	6.5
Net income applicable to bond interest	$2,877,537	70.5	$2,779.130	74.6
Bond interest on N. Y. & J. 5's, first mortgage 4½'s and first refunding 5's	2,155,402	52.8	2,137,998	57.4
Net income available for income bond interest	$722,135	17.7	$641,132	17.2

The growth of traffic which began to manifest itself in the fall of 1915 continued steadily throughout 1916, the increase in the number of passengers carried during the year being 6,268.438, or about 10.5 per cent. Of this increase, 4,682,540 passengers (13.1 per cent) represents the growth in the downtown traffic and 1,585,898 (6.6 per cent) in the uptown traffic. The passenger revenue increased $344,882 or 9.9 per cent. while other items showed the following changes: Advertising, a decrease of $8,778 or 7.1 per cent; other car and station privileges, an increase of $4,582 or 6.6 per cent; sale of power, an increase of $8,608 or 71.2 per cent; miscellaneous revenue other than transportation, an increase of $12,379 or 40.5 per cent, and miscellaneous transportation revenue, a decrease of $3,014 or 19.5 per cent. The net effect on operating revenues was a gain of $358,859 or 9.6 per cent.

During 1916 the company experienced unavoidable increases in the cost of operation. These became most noticeable in the later months of the year, and were the result principally of wage increases and fuel shortage. The total operating expenses rose $166,038 or 11.4 per cent. All sections of the expense group, with the exception of maintenance of way and structures (which decreased $1.363 or 0.5 per cent), showed increases, as follows: Maintenance of equipment, $39,502 or 22.0 per cent; power, $32,477 or 13.3 per cent; transportation, $64,161 or 10.4 per cent; traffic, $2.197 or 197.9 per cent, and general, $29,062 or 19.7 per cent. As a result the gain in net operating revenue was cut to $192,821 or 8.5 per cent.

After careful study the board of directors reached the conclusion that it was in the interest of the company and of its security holders to considerably strengthen itself financially, so that it might be fortified against any contingencies. The report of Stone & Webster, noted in the ELECTRIC RAILWAY JOURNAL of March 3, confirmed the judgment of the directors that it was urgently necessary promptly to attain an adequate cash reserve—at least $1,000,000, their report said. Therefore, on Feb. 26 an appropriation of $340,000 was made to the reserve account for the period ended Dec. 31, 1916. An initial appropriation of $50,000 to this reserve had been made as of June 30, 1916, making the total appropriated $390,000. As this appropriation absorbed the surplus earnings of the company for the period ended Dec. 31, 1916, no distribution of interest upon the adjustment income bonds was made on April 1 for the last six months of 1916. For the first six months $331,020 had been paid. The surplus balance carried forward to 1917 was $51,359.

The following table gives some comparative statistics for the last two calendar years:

	1916	1915
Passenger revenue per revenue car mile	$0.4696	$0.4456
Gross railroad operating revenue per revenue car mile	0.5018	0.4774
Operating expenses (excluding taxes) per revenue car mile	0.1993	0.1866
Net railroad operating revenue per revenue car mile	0.3025	0.2908
Passenger revenue per passenger	0.0578	0.0580
Gross railroad operating revenue per passenger	0.0617	0.0621
Operating expenses (excluding taxes) per passenger	0.0245	0.0243
Net railroad operating revenue per passenger	0.0372	0.0378

London Street Railway

The gross earnings of the London (Ont.) Street Railway for the year ended Dec. 31, 1916, amounted to $426,314, an increase of $27,456, or 6.8 per cent, over those of the preceding year. Of this total, passenger traffic accounted for $420,704, an increase of $27,405, or 6.9 per cent. The total operating expenses amounted to $292,400, an increase of $17,188, or 6.2 per cent, this arising mostly from increases of $21,085, or 72.5 per cent, for maintenance of equipment, $7,344, or 5.5 per cent, for transportation expenses for car service, and $8,996, or 22 per cent, for general expenses. The net earnings for the year at $133,913 increased $10,267, or 8.3 per cent, but owing mostly to the increase of $8,123 in taxes, the net income at $93,610 showed a gain of only $2,757, or 3 per cent.

During the year $55,831 was expended for construction and equipment, $54,965 being for track and roadway construction. The passengers carried in 1916 totaled 11,518,428, as compared to 10,801,531 in 1915, and the car earnings per revenue passenger fell from 3.68 cents in 1915 to 3.67 cents in 1916. Transfers increased from 1,765,067 to 1,792,579, so that the car earnings per passenger dropped from 3.13 cents to 3.08 cents. The gross earnings per car mile were 21.99 cents in 1916 and 20.48 cents in 1915, while the net earnings per car mile were 6.91 cents and 6.35 cents respectively. The gross earnings per mile of track showed an increase from $11,334 in 1915 to $11,835 in 1916.

Although approximately 3000 citizens went with the overseas forces, the business of the company continued to increase substantially. Several battalions of soldiers were brought to London for training, so that approximately 12,000 men were in camp during May and June. This made extra car service necessary, and caused abnormal earnings for those two months. After that a large percentage of the troops was moved away for more extensive field training.

Liverpool Corporation Tramways

The total revenue of the Liverpool (England) Corporation Tramways for the calendar year 1916 amounted to £766,577. The operating costs, including the rental of leased lines, totaled £518,037, leaving a gross profit of £248,540. The net profit for the year, after the payment of interest, sinking fund charges and reserve payments, amounted to £145,971, an increase of £22,777 as compared with 1915.

The number of passengers carried in 1916 was 157,636,595, an increase of 6,880,915 over 1915, while the passenger receipts at £738,321 showed a gain of £41,428. The car-miles run in 1916 amounted to 12,688,163, an increase of 6145. The average earnings per car-mile for 1916 amounted to 13.97*d*. as compared to 13.20*d*. for 1915, an increase of 0.77*d*. The average fare per passenger in 1916 was 1.124*d*. as compared to 1.109*d*. in the preceding year. Up to Dec. 31, 1916, a total of 9,766,916 free transfers had been issued to members of the British forces, these being equivalent to £45,131.

Thirteen and a half million more passengers were carried in 1916 than in 1913, which had been the record year of the system. This large increase was no doubt brought about by the enormous number of persons employed in the manufacture of munitions and on admiralty and transport work in the port.

Chicago Railways

The comparative income statement of the Chicago (Ill.) Railways for the years ended Jan. 31, 1916 and 1917, follows:

	1917	1916
Gross earnings of Chicago Surface Lines	$34,789,636	$31,690,761
Operating expenses	21,743,522	21,041,356
Residue receipts	$13,026,114	$10,649,405
Chicago Railways' proportion of residue receipts (60 per cent)	$7,827,668	$6,283,149
Expenses and adjustments applicable to previous years	290,684	20,327
	$7,536,983	$6,262,822
Less 5 per cent on capital valuation	4,319,783	4,230,975
Divisible income	$3,217,200	$2,031,847
City of Chicago, 55 per cent	1,769,460	1,117,516
Chicago Railways, 45 per cent	$1,447,740	$914,331
Interest allowance on valuation	4,319,783	4,230,975
Interest on bank balances	66,960	64,807
Income from treasury securities	123,886	103,440
Gross income	$5,958,369	$5,313,553
Deductions	5,180,354	4,982,981
Net income	$778,015	$330,573

The full details of the earnings and expenses of the Chicago Surface Lines were published in the ELECTRIC RAILWAY JOURNAL of April 21, in connection with the annual report of the Chicago City Railway, which with other South-Side Lines receives 40 per cent of the residue receipts. As noted at that time, the gross earnings of all the surface lines increased $3,098,874 or 9.78 per cent during the last fiscal year.

The part of this gain coming to the Chicago Railways through its 60 per cent share in the residue receipts was $1,544,519, an increase of 24.5 per cent. The company's own gross income, after the city had deducted its 55 per cent share of the divisible total, represented a gain of $533,409 over the amount of $914,331 the year before, or not far from 60 per cent.

The net income of the company for the year was $778,015, as compared with $330,572 for the preceding year. The net income combined with the surplus at the beginning of the year amounted to $1,064,967. Deducting from this latter amount the total of the two dividends (participation certificates—Series 1, $8; Series 2, $2), together with the adjustment income bond interest for the preceding year (paid out of surplus May 1, 1916), aggregating in all $611,200, the surplus balance at Jan. 31, 1917, was $453,767. From this surplus there will be payable on May 1, 1917, the annual interest on the adjustment income bonds, amounting to $100,000.

During the year approximately $1,800,000 was expended for new construction and extensions under ordinance requirements. The company constructed a total of 11.08 miles of single track, making the total 580.65 miles. The unexpended balance in the special renewal and depreciation reserve fund on Jan. 31, 1917, was $3,663,514.

Dominion Power & Transmission Company, Ltd.

The comparative income statement of the Dominion Power & Transmission Company, Ltd., Hamilton, Ont., for the years ended Dec. 31, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Gross earnings	$2,693,211	100.0	$2,353,956	100.0
Operating expenses	1,459,601	54.2	1,352,001	57.4
Net earnings	$1,233,610	45.8	$1,001,955	42.6
Transfer to maintenance and renewal account	157,689	5.9	109,640	4.6
Balance	$1,075,921	39.9	$892,315	38.0
Bond and other interest	365,573	13.5	384,772	16.4
Surplus earnings	$710,348	26.4	$507,543	21.6

The indications of the closing months of 1915, that the business of the company was rapidly tending toward recovery from the low figures of the 1914 report, were realized during 1916. The gross business for the last year was about equal to that of 1913, the best year preceding the war, and it is believed that there is hope for the coming year to show an improvement over 1913.

The gross earnings of the company gained $339,255, or 14.4 per cent, during the last year as compared to 1915, while the operating expenses increased only $107,600, or 7.9 per cent, so that the net earnings showed a gain of $231,665, or 23.1 per cent. The bond and other interest decreased $19,199, or 4.9 per cent, with the result that the surplus earnings for the last year represented a gain of $202,805, or about 40 per cent, as compared with those of the year preceding. After appropriating $250,000 to the regular reserve, paying dividends of $534,351 and making other adjustments, the profit and loss account on Dec. 31, 1916, totaled $536,060, as compared to $639,259 the year before.

The unexpended balance of the company's allowance of 20 per cent of the gross earnings for maintenance and renewals totaled $157,689 in 1916, as compared to $109,640 in 1915. This balance was credited to the reserve for maintenance and renewals. The withdrawals from the account in 1916 amounted to $46,610, and the reserve on Dec. 31, 1916, amounted to $403,050, an increase of $111,079 over the reserve the year before.

Staten Island Merger Disapproved

The Public Service Commission for the First District of New York has disapproved a proposed merger of the Richmond Light & Railroad Company and the Staten Island Midland Railway and the issue of certain securities incident to the proposed merger, as noted in the ELECTRIC RAILWAY JOURNAL of May 12, page 891. The commission acted upon an opinion prepared by Commissioner Charles S. Hervey. The opinion held that the merger plan included certain features inimical to the public interest and contrary to law and sound finance. The two companies own and operate all of the street railways on Staten Island, and in addition the Richmond Light & Railroad Company has a monopoly of the supply of electricity in Richmond Borough. It was proposed to consolidate the two companies and to issue $1,350,000 par value of 6 per cent cumulative preferred stock and $3,291,000 par value of common stock. In addition there was to be executed a mortgage and deed of trust to secure $7,500,000 par value of first and refunding mortgage 6 per cent gold bonds to be issued by the new corporation. Antecedent to the consolidation it was contemplated that the Staten Island Midland Railway should increase its authorized capital stock from $1,000,000 to $3,250,000. Commissioner Hervey criticized the plan for the merger on several grounds, one being to the effect that the company had submitted no proof that the bonds to be refunded had been issued for capital purposes. He also found cause to criticize a proposal to refund $350,000 in unpaid interest coupons of the Staten Island Midland Company by the issue of preferred stock. The commissioner held as a result of his study of the case that one claim of the applicants, namely, that the new securities would represent a decrease of $530,750 in capitalization, was erroneous. In substance, Commissioner Hervey held that various features of the plan were such as to place the commission in a position of acting illegally were it to grant approval of the proposed securities issues.

American Power & Light Company, New York, N. Y.—The combined gross earnings of the American Power & Light Company subsidiaries for the calendar year 1916 totaled $8,501,614, as compared to $7,817,802 the year before, while the net earnings in the two years were $3,941,669 and $3,566,334 respectively. Of the 1916 gross $182,383 or 2 per cent came from railway lines, this being divided $141,984 to the Pacific Power & Light Company, or 9 per cent of this subsidiary's earnings, and $40,399 to the Southwestern Power & Light Company, or 1 per cent of this company's earnings.

Billings Railway, Light & Power Company, Billings, Mont. The Billings Railway, Light & Power Company has been incorporated to take over the property of the Billings Traction Company and electrify the line. The authorized capital stock of the new company is $300,000.

Columbus, Delaware & Marion Railway, Cincinnati, Ohio.—Under the order of sale recently issued by Judge Kinkead of the Common Pleas Court at Columbus, Ohio, E. K. Stewart of the Columbus Railway, Power & Light Company, William F. Burdell and Fred W. Herbst were appointed appraisers of the property of the Columbus, Delaware & Marion Railway. On May 8 they made their report which fixed the total value at $2,000,000 and set out that there are outstanding mortgage liens for $1,582,505 and damage claims estimated at $50,000, leaving a balance of $367,494. Other obligations outstanding amount to $920,000. On the following day the court approved the appraisement and fixed the upset price of the property at public sale at $250,000, subject to the liens. Eli M. West was appointed special master to sell the property on June 11. He has been receiver of the company for several years.

Hagerstown & Frederick Railway, Frederick, Md.—The stockholders of the Hagerstown & Frederick Railway have approved the plan for the readjustment of the finances of the company referred to in the ELECTRIC RAILWAY JOURNAL for May 12, page 891. Under the new plan the yearly interest charges and the preferred stock requirement will be reduced about $20,000 a year. A portion of the old preferred stock will be converted into new common stock and the holdings of the old common stockholders will be reduced by two-thirds. The plan is to date back to May 1. It has also been decided to dissolve the voting trust after the new plan becomes effective. The plan, however, must first be passed upon by the Maryland Public Service Commission. It is said unofficially that "it is expected that on the basis of the earnings for the year ended Dec. 31, 1916, the company will pay quarterly dividends on its new preferred stock beginning Aug. 1."

Havana Electric Railway, Light & Power Company, Havana, Cuba.—A special meeting of the stockholders of the Havana Electric Railway, Light & Power Company was adjourned on May 17 until May 22. Retiring directors were re-elected at the annual meeting of the company. It was proposed at the special meeting to vote on the matter of increasing the capital stock of the company in accordance with the conditions reviewed briefly in the ELECTRIC RAILWAY JOURNAL of April 28, page 799.

Illinois Traction Company, Peoria, Ill.—The Illinois Public Utility Commission has authorized the Urbana & Champaign Railway, Gas & Electric Company to issue 5 per cent debenture bonds to the extent of $114,000. The commission has also authorized the Galesburg Railway, Lighting & Power Company to issue 6 per cent cumulative preferred stock to the amount of $141,000. Both companies are controlled by the Illinois Traction Company. A committee of citizens of Lincoln, Ill., is understood to have conferred recently with H. E. Chubbuck, vice-president executive of the Illinois Traction Company, with respect to the taking over by that company of the street railway service in Lincoln operated previously by the Lincoln Railway & Heating Company. Last summer the Illinois Public Utilities Commission authorized the Lincoln Railway & Heating Company to discontinue business provided the Council of Lincoln would concur in the suspension of street railway service. The city desires to have the service continued. The property at Lincoln is a very small one and the basis on which the officers of the Illinois Traction Company were approached has not been disclosed.

J. G. White Companies, New York, N. Y.—The report of The J. G. White Companies for the year ended Dec. 31, 1916, presents an amalgamated balance sheet showing the following items: Assets—good will, contracts, etc., $1,512,351; securities owned and syndicate participations, $2,341,542; miscellaneous assets, $95,107; bills receivable, less reserve for doubtful items, $395,350; accounts receivable, less reserve for doubtful accounts, $577,942; interest and dividends accrued, $17,239; cash in bank and on hand, $500,941, and working capital and cash in branch offices, $4,004. Liabilities and capital—capital stock issued, $4,300,000; bills payable, $325,000; accounts payable, $158,977; dividends payable, $44,000; accruals less deferred charges and sundries, $24,231, and surplus or undivided profits, $592,270. During 1916 a large block of securities was liquidated at a satisfactory profit over the balance sheet figures. Since Dec. 31, 1916, the engineering corporation has secured several important and satisfactory engineering and construction contracts on a percentage basis and a large amount of profitable business in its purchasing and commercial departments. The management corporation has also secured some important management contracts in new lines of endeavor, including the management of sugar estates and industrial concerns.

Lake Shore Electric Railway, Cleveland, Ohio.—At the annual meeting of the Lake Shore Electric Railway on May 14 F. H. Goff, president of the Cleveland Trust Company; I. F. Frieberger, vice-president of the Cleveland Trust Company; J. R. Nutt, vice-president of the Citizens' Savings & Trust Company, and Charles Currie, vice-president of the Northern Ohio Traction & Light Company, were elected directors to succeed the late Henry A. Everett, J. B. Hanna, T. H. Hogsett and John P. Witt. The bank officials represent the estate of Mr. Everett. The officers of the company are: E. W. Moore, president; F. H. Goff, vice-president; A. Lewenthal, vice-president; F. W. Coen. vice-president and general manager; John P. Witt, secretary and treasurer.

Lehigh Valley Transit Company, Allentown, Pa.—At the close of business on May 9 there had been deposited $3,385,250 shares of preferred and $2,288,000 shares of common stock receipts of the Girard Trust Company, issued against deposits of Lehigh Valley Transit Company stock under the proposal of merger with the Lehigh Navigation Electric Company. This indicates that deposits in assent to the merger plan amount to 67.9 per cent of the preferred and 76.3 per cent of the common. It is stipulated that not less than 70 per cent of each class of stock be deposited. There is still needed $100,531 preferred stock to bring the total deposits up to the required figure.

Minster & Loramie Railway, Fort Loramie, Ohio.—The property of the Minster & Loramie Railway, operated by the Western Ohio Railway, has been sold for $23,000 at receiver's sale to C. P. Gress, representing the New Bremen First National Bank acting for creditors of the company. The road is 3.3 miles long. Energy for operation is furnished by the Western Ohio Railway.

Monongahela Valley Traction Company, Fairmont, W. Va.—The outstanding first mortgage bonds of the Fairmont & Mannington Railroad, which is controlled by the Monongahela Valley Traction Company, dated Jan. 1, 1916, have been called for payment on July 1 at 105 and interest at the office of the Guarantee Title & Trust Company, Pittsburgh.

Municipal Service Corporation, Philadelphia, Pa.—Announcement is made of the conclusion of the negotiations for the sale of the property of the Youngstown & Suburban Railway to the Municipal Service Corporation through an exchange of stock dollar for dollar. The securities of the Youngstown & Suburban Railway said to be included are the entire $350,000 of common stock, $500,000 of 6 per cent cumulative preferred stock and $700,000 of first mortgage 5 per cent bonds.

Pittsburgh & Butler Railway, Pittsburgh, Pa.—The property of the Pittsburgh & Butler Railway was sold at public auction on May 9 at $670,500. The property was bought by interests who are said to control the Pittsburgh, Harmony, Butler & New Castle Railway.

Southern New York Power & Railway Corporation, Cooperstown, N. Y.—The Southern New York Power & Railway Corporation on May 8 filed a certificate at Albany increasing its authorized capital stock from $1,500,000 to $2,500,000.

United Railways Investment Company, San Francisco, Cal.—The trustee of the mortgage had on hand on May 5 $1,747,000 par value of the United Railways Investment Company collateral trust sinking fund twenty-year 5 per cent gold bonds in the sinking fund, as compared with $1,388,000 on May 3, 1916, indicating that during the year $359,000 par value of the bonds has been purchased. In the twelve months previous to May, 1916, $322,000 par value of the bonds were acquired and in the twelve months preceding May, 1915, $350,000. The sinking fund provisions require that each year there shall be purchased a par value of the bonds equal to 1 per cent of the original issue, and the interest on the bonds purchased. This would have required the purchase last year of less than $250,000 par value of the bonds, whereas $359,000 were actually acquired, owing to the basis on which the bonds could be purchased in the open market.

Winnipeg (Man.) Electric Railway.—The gross earnings from operation of the Winnipeg Electric Railway for the calendar year 1916 totaled $3,311,169, with operating expenses at $1,939,041, so that the net operating revenues amounted to $1,372,128. The gross income available for fixed charges totaled $1,398,138 and the net income $445,251. The last figure is equivalent to about 5 per cent on the capital stock. The net income in 1916 showed a decrease of $35,742 from the results for 1915. According to a statement of the directors, the disappointing 1916 result was caused by the substantial increases in the cost of all materials necessary for the railway, gas and lighting departments, as well as by the serious competition of jitneys in Winnipeg. It was said to be reasonable to assume that with a return to normal conditions the revenues from the various departments will show satisfactory increases.

Dividends Declared

Central Arkansas Railway & Light Company, Hot Springs, Ark., quarterly, 1¾ per cent, preferred.

Central Mississippi Valley Electric Properties, Keokuk, Iowa, quarterly, 1½ per cent, preferred.

Pensacola (Fla.) Electric Company, quarterly, 2½ per cent.

Electric Railway Monthly Earnings

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
BATON ROUGE (LA.) ELECTRIC RAILWAY						
1m., Mar.,	'17	$18,277	*$9,637	$8,640	$3,525	$5,115
1 " "	'16	16,199	*8,999	7,200	3,461	3,739
12 " "	'17	218,061	*102,432	115,629	42,212	73,417
12 " "	'16	197,636	*106,935	90,701	30,989	59,712
CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.						
1m., Mar.,	'17	$33,753	*$20,905	$12,848	$6,552	$6,296
1 " "	'16	27,866	*19,940	7,926	6,451	1,475
12 " "	'17	407,386	*237,115	170,271	78,553	91,718
12 " "	'16	371,850	*215,629	156,221	78,780	77,441
COLUMBUS (GA.) ELECTRIC COMPANY						
1m., Mar.,	'17	$87,851	*$33,907	$53,944	$28,350	$25,594
1 " "	'16	66,735	*28,272	38,463	28,705	9,758
12 " "	'17	936,494	*362,619	573,875	342,788	231,087
12 " "	'16	752,394	*328,458	423,936	344,242	79,694
DALLAS (TEX.) ELECTRIC COMPANY						
1m., Mar.,	'17	$188,025	*$120,055	$67,970	$40,794	$27,176
1 " "	'16	159,828	*100,143	59,685	36,779	‡24,906
12 " "	'17	2,061,842	*1,251,280	810,562	463,546	‡359,160
12 " "	'16	1,851,642	*1,140,849	710,793	414,454	‡303,539
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.						
1m., Mar.,	'17	$75,062	*$43,077	$32,985	$9,913	$23,072
1 " "	'16	62,339	*34,888	27,451	8,867	18,584
12 " "	'17	862,126	*462,488	399,638	110,502	289,136
12 " "	'16	761,575	*398,230	363,345	105,630	257,715
GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.						
1m., Mar.,	'17	$157,469	*$112,719	$44,750	$36,417	$8,333
1 " "	'16	158,393	*106,471	51,922	36,178	15,744
12 " "	'17	1,953,072	*1,254,997	698,075	439,695	258,380
12 " "	'16	1,925,685	*1,220,785	704,900	434,868	270,032
HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.						
1m., Mar.,	'17	$30,497	*$19,606	$10,891	$5,026	$5,865
1 " "	'16	27,190	*14,692	12,498	5,357	7,141
12 " "	'17	334,706	*194,572	140,134	62,948	77,186
12 " "	'16	292,373	*162,348	130,025	66,259	63,766
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.						
1m., Mar.,	'17	$199,545	*$114,173	$85,372	$29,182	$56,190
1 " "	'16	166,936	*101,660	65,276	28,725	36,551
12 " "	'17	2,000,099	*1,188,249	811,850	347,921	463,929
12 " "	'16	1,777,984	*1,086,617	691,367	335,631	355,736
PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.						
1m., Mar.,	'17	$768,418	*$478,629	$289,789	$191,724	$98,065
1 " "	16	655,362	*440,468	214,894	184,372	30,522
12 " "	'17	8,461,666	*5,206,585	3,255,081	2,234,954	1,020,127
12 " "	'16	7,603,965	*4,850,755	2,753,210	2,189,950	563,260
SAVANNAH (GA.) ELECTRIC COMPANY						
1m., Mar.,	'17	$77,252	*$52,672	$24,580	$24,077	$503
1 " "	'16	65,269	*45,240	20,029	23,344	†3,315
12 " "	'17	855,893	*566,586	289,307	284,792	4,515
12 " "	'16	786,035	521,013	265,022	278,401	13,378
TAMPA (FLA.) ELECTRIC COMPANY						
1m., Mar.,	'17	$89,765	*$46,954	$42,811	$4,373	$38,438
1 " "	'16	81,928	*45,224	36,704	4,395	32,309
12 " "	'17	980,349	*534,499	445,850	52,328	393,522
12 " "	'16	989,708	*513,922	475,786	52,202	423,584

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*Includes taxes. ‡Includes non-operating income.

Traffic and Transportation

Pennsylvania Jitneys Lose in Court

Decision Received Upon Appeal to Superior Court States That Jitneys Operating Within City Limits Are Common Carriers

The Superior Court of Pennsylvania has handed down a decision in a case involving the Scranton Railway, following an appeal from an order of the Public Service Commission which, it is believed, will affect the future of jitney operations in that State. It affirmed the order of the commission, thereby putting the control of jitneys under the jurisdiction of that body by classing them as common carriers.

The public service commission act of July 26, 1913, states: "The term 'common carrier' as used in this act includes any and all common carriers whether corporations or persons engaged for profit in the conveyance of passengers or property or both between points within this Commonwealth by, through, over, above or under land or water or both." The question involved in this case as presented by the appellant was whether the Public Service Commission has jurisdiction over those operating jitney service entirely within the limits of one municipality, and whether such operation is "between points."

HOW THE COURT REASONED

The court, in its decision, held it must be admitted that a jitney bus as ordinarily operated is a common carrier, and said that the counsel for the appellant had advanced no argument to the contrary, but had regarded the words "between points within this Commonwealth," appearing in the section above quoted, to apply to operation confined to the limits of a city or town. It maintained that although the word "point" is often used as a synonym for a city or town, the meaning of the word also includes parts of the same town. It refused to interpret the act to mean that a public carrier operating wholly within the limits of any city, but covering routes between terminals which might be more than 20 miles apart, would not come within the provision of the act. The decision stated further that the legislative intention was not to make an exempted class of public carriers operating wholly within the limits of a city and including those who ran beyond, and that the words "within this Commonwealth," as applied to this question, was evidently used to designate intrastate commerce as distinguished from inter-state traffic.

CORPORATIONS UNDER DUAL CONTROL

By an act of June 1, 1915, the power to regulate and license certain motor vehicles was given to the cities and it was contended that this is an implied repeal of the public service act of 1913, so far as it relates to the same subject. There is no express repeal in the later act, and if one is implied it would mean that both acts could not stand. Many public service corporations which fall under the provisions of the public service act are subject to local regulation, such as street car lines, which may not be constructed until municipal consent is obtained, and railroads, which are subject to ordinances requiring them to place watchmen at crossings and subjecting them to other regulations.

In view of the above the court concluded that the authority given by the act of 1915 could not be held in any view of the matter to give cities any power that would abrogate the right of the Public Service Commission to require a certificate of public convenience. The two powers do not intrench on each other since the Public Service Commission and City Councils can exercise their powers coordinately. This decision will no doubt form a better basis for jitney regulation in Pennsylvania. Heretofore the city drivers have declined to operate with a certificate of public convenience since they contended they were subject only to the municipal authorities.

Jitney Insurance Question in Washington

H. O. Fishback, State Insurance Commissioner of Washington, has submitted to the Attorney General a proposal of the Mutual Union Insurance Company of Seattle, composed of jitney operators, to furnish surety insurance for jitney operators. The point raised is whether a mutual company can insure the traveling public or only its own members. Commissioner Fishback has decided to permit the new mutual company, composed entirely of jitney operators, with W. R. Crawford, Seattle, as general counsel, to insure its members for $1,000 against accident to themselves, and upon the collection of a cash reserve of $5,000 additional to $6,452 now paid in, to write liability insurance for machines of members up to $2,500, upon additional premiums of $200 annually, $30 of which is paid in cash and balance at $10 a week.

As the State Supreme Court has held jitney bondsmen liable up to $2,500 for each person injured in a wreck, the jitney operator mutual insurance does not yet meet the requirements of the Supreme Court, it is claimed, but it is believed an effort will be made to accumulate sufficient reserve for that purpose, if it is held that a mutual company may write surety insurance.

A list of 321 members applying for the machine liability insurance has been filed with the insurance commissioner, with another list of 500 subscribing for accident insurance.

The jitney men of Spokane, applying for a temporary injunction preventing the city from requiring them to give bond in order to operate, quoted A. M. Winston, assistant corporation counsel of the city, to the effect that jitney operators could get bonds without trouble if they had adequate collateral.

Los Angeles Anti-Jitney Men Multiply

The committee representing the 3500 employees of the Los Angeles (Cal.) Railway has filed with the City Clerk the initiative petition signed by more than 35,000 registered voters, which asks for the adoption of an initiative ordinance intended to insure a more effective control of the operation of jitneys as reported in this paper for May 5, page 846. The proposed ordinance will be submitted to the people at the coming election on June 5.

W. A. Hagans, organizer of the Jitney-bus Operators' Association, said: "This is a most drastic measure and if put into effect will stop jitneys from operating in the downtown business district after July 1."

The employees of the Pacific Electric Railway have joined forces with the men of the Los Angeles Railway in the movement for better jitney regulation and have circulated petitions in a similar way. They are pleased with the responses received and claim that when the necessary eliminations are made because of faulty signatures, they will be able to file nearly 75,000 valid signatures in addition to the 35,000 which the Los Angeles Railway employees have obtained.

Service Reductions in Tacoma

The Tacoma Railway & Power Company and the Pacific Traction Company, Tacoma, Wash., will reduce service on car lines which have been operated at a loss. L. H. Bean, manager of the companies, is quoted in part as follows:

"The companies have endeavored to maintain a service for the public in all ways satisfactory for their needs, and in order to do this we have been forced to operate at a loss. We have repeatedly called attention to the serious financial situation which confronts the companies. We hoped to be relieved of burdens such as paving and the tax on gross earnings which are not in any way necessary for furnishing service. This relief having been temporarily deferred, we are forced to reduce service on lines where service has been maintained entirely for the benefit of the public but at a serious financial loss to us."

Mr. Bean also states that after thirty days city commutation tickets will be withdrawn. These tickets are used by city employees during working hours. They aggregate about $6,000 a month.

Auto Drivers Urged to Use More Care

An open letter was recently sent out by General Manager A. R. Myers of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., with a view to secure the co-operation of automobile drivers in reducing the number of automobile accidents. It was a personal appeal to all concerned to take an added interest in the elimination of unnecessary pain, injuries and expense. The letter read, in part, as follows:

"We do our part by educating our motormen and conductors to avoid collisions with automobiles and other vehicles. You can do your part without any expense to you, and we ask you to do it. Do you forget to check the speed of your car when with obstructed view either way you approach an intersecting street on which cars operate? If so, your habit should be changed. Some automobile drivers turn to the left onto a track in front of cars going in the same direction in order to pass a more slowly moving vehicle or one standing at the curb. It is easy to misjudge the speed of a trolley car and to mistake the amount of space in passing between the car and other vehicles. Did you ever do this? If so, for your family, yourself and for your friends, stop it.

"Our experience and investigations compel us to speak candidly. We are making this a personal matter. If you are a careful driver you will not resent this letter. If you are inclined to be careless you cannot in fairness resent it. 'Safety First' is a great big humanitarian movement. If we all pull together we can succeed. Will you help?"

Bay State Fare Bill Turned Down

The lower house of the Massachusetts Legislature has voted down the report of the joint committee on rules, accepted by the Senate, favoring the admission of a 6-cent fare bill for the Bay State Street Railway. Owing to the lateness of the session, it was necessary to secure a suspension of the rules to permit consideration of the bill. Now it is said, the bill must go to the next Legislature.

The bill providing for an increase in fare stipulated that the 6-cent rate should apply to a single continuous trip in any fare zone as already laid out or which might hereafter be established by the Public Service Commission. The bill provided that the company should pay no dividends on its common stock for two years, and that its net earnings above preferred-stock dividends should be expended for improving the property.

The company has also had a clause introduced which provided for an investigation of the problem of public ownership by a commission to consist of two Senators, four Representatives, one member of the Public Service Commission and four citizens, the last five to be named by the Governor. The lower house of the Legislature also refused to admit this provision for consideration.

The filing of the relief bill followed about nine months' experience under the ruling of the commission in the noted 6-cent rate case of 1916, in which the board denied the company permission to raise its fare to 6 cents throughout the greater part of the system, but authorized this unit on the country lines.

S. H. Pillsbury, counsel for the company, stated at a legislative hearing that the credit of the road was exhausted; that no new money could be raised, and that earnings had shrunk more than $1,000,000 in the last three years. Mr. Pillsbury said that in the past three months the company had run $145,522 short of its expenses, without making any allowance for depreciation. He contended that the present cost of carrying a passenger was 6.10 cents, compared with 5.27 cents in 1916, 5.14 cents in 1915, and 4.94 cents in 1914. The company was willing to sell its property at about $39,000,000, the value fixed by the commission in the rate case.

Fare Protest Under Consideration.—The Borough Council of Rutherford, N. J., has under consideration the matter of seeking a reduction in the present 15-cent fare to Newark over the Public Service Railway.

Half-Fare Hearing Postponed.—The Public Service Commission of Massachusetts has postponed to June 5 its hearing upon the scholar's half-fare petition of the Bay State

Street Railway, on account of pending legislation in connection with the company's 6-cent fare bill and the proposed investigation of public ownership of street railways.

Increase in Monthly Commutation Authorized.—The State Railroad Commission of California has authorized the San Francisco Napa & Calistoga Railway, Napa, Cal., to make a commutation fare of $6 for the calendar month between Napa and Vallejo. The company asked the commission to increase the present commutation from $5 to $7.80, alleging the existing fare to be non-remunerative in consideration of the character of service rendered.

United Railroads Haul Fewer Passengers.—During March the United Railroads, San Francisco, Cal., carried 17,900,000 passengers, only about 85 per cent of the number carried in the same month of 1914. These figures were given out as evidence that street railways have not shared the general prosperity since the war began. Among the reasons advanced for this decrease is competition from the jitneys and the Municipal Railway of that city.

Macon Men Insured.—Approximately 150 motormen and conductors in the service of the company have been insured by the Macon Railway & Light Company, Macon, Ga., for sums ranging from $200 to $500, each premium being paid by the company. Each employee must have six months' service to his credit in order to be insured. Each man having two years' service is insured for $200; three years' service, $300, with $500 as the maximum.

Kentucky Derby Affords Traffic Problems.—The attendance on May 12 at the forty-third renewal of Derby Day, the annual racing tournament in Louisville, Ky., was one of the highest on record and taxed the capacity of the Louisville Railway. It is estimated that the company hauled about 34,000 people from the downtown district to Churchill Downs, the scene of the races. This is more than the number of passengers hauled last year. All the available equipment of the company was put in service and no accident was reported. An improvement was made in the service this year by changes in routing in Louisville.

Protest Proceedings Authorizing Seattle One-Man Cars.—At a recent meeting of the city utilities committee, Councilman W. D. Lane, chairman of the judiciary committee, filed a protest against the action of the State Public Service Commission in issuing an order allowing the use of single-truck and single-operator cars by the Puget Sound Traction, Light & Power Company in Seattle, Wash., without advising the city of such an application. A copy of the order was referred to Councilman Lane by Corporation Counsel Hugh M. Caldwell, for preparation of such a protest. The use of one-man cars was referred to the Council by the officials of the company several months ago, but no action was taken. Several weeks later, an application for an order allowing the use of this type of car was made to the Public Service Commission. It is understood that Mr. Lane's protest will be limited to an arraignment of the Public Service Commission for the alleged granting of a petition without notifying the Council and holding hearing in regular form.

Taking Chances.—Not long ago Gerald Stanley Lee of Northampton, Mass., who gained fame with his book "Crowds," wrote an appreciation of all the wonderful things that the patron of an electric railway car got for his nickel. That appreciation was republished in the ELECTRIC RAILWAY JOURNAL and then was copied and used by many publications distributed to railway employees. An opportunity exists now for some one to put into language that will live the prospect that the jitney patron has in store for him for his nickel. There are the reckless driving, the crowding, the collisions, the thefts that take place in poorly lighted cars and finally the prospect that your driver may do as did Charles Yasmagian, a licensed jitney driver of Lowell, Mass., that is, peer into the gasoline tank with a lighted match to see how low his supply of gas was. If he should do that there are added to the ordinary thrills of the jitney ride the clanging of the fire bells, the coming of the engines, the approach of the ambulances, prospects of a cot in the hospital and finally burial in the country churchyard. All the melodrama of the movies for 5 cents! After life's fitful fever you will probably sleep well, but by taking a jitney you increase materially the likelihood of your sleeping before your allotted time.

Legal Notes

CHARTERS, ORDINANCES, FRANCHISES

KENTUCKY.—*Improvement of Street by City—Franchise—"In All Respects."*

Where a street railway company franchise required it to improve its portion of the street to conform with the rest of the street "in all respects," and upon the company's refusal the city constructed the company's portion, different only in the depth of excavation necessary to accommodate ties and foundation, this was not contrary to the franchise, and the company was liable for the cost. (Central Kentucky Traction Co. v. City of Winchester, 191 Southwestern Rep., 636.)

TEXAS.—*Legal Difference Between "Express" and "Freight."*

The question whether goods carried by an interurban electric railroad are express or freight, on which depends whether the railroad is an additional servitude on the street, does not depend on the weight of the separate articles but on the manner in which they are carried, since the carriage of a few heavy articles would not damage the abutting owners more than the carriage of a large number of lighter articles in the same car. (Galveston-Houston Electric Ry. et al. v. Jewish Literary Society, 192 Southwestern Rep., 324.)

WISCONSIN.—*Repaving Ordinance Is Valid Even If It Reduces Earnings.*

The fact that an ordinance, requiring a street railway to repave its track zone with the same material used by the city, will unreasonably reduce its earning capacity, so as to fail to give reasonable return on the investment, will not invalidate the ordinance, since the company can apply to the Railroad Commission for a change in rates if necessary.

The Milwaukee ordinance of Nov. 8, 1915, requiring a street railway to repave its track zone with the same material used by the city, is not unconstitutional as impairing a contract obligation, since previous ordinances relating thereto did not give the railroad company a contractual right, but were merely regulative, nor does it deprive the company of its property without due process of law. (State ex rel. City of Milwaukee v. Milwaukee Electric Railway & Light Co., 161 Northwestern Rep., 745.)

LIABILITY FOR NEGLIGENCE

NEW YORK.—*Ice on Car Platform.*

Where a carrier did nothing to remove ice from the platform of a car operated in a large city, with frequent stops at short intervals, with large numbers of persons passing in and out, and gave the passengers no notice of the presence of the ice, an inference of negligence is warranted. (Altberger v. New York Consolidated Railroad, 162 New York Sup., 739.)

NEW YORK.—*Injury Where Passenger Assumes Car Will Stop at Station.*

Where the local cars of a railroad company stopped on signal at a station established to receive passengers, and no particular form of signal was established, a prospective passenger clearly visible, with a suitcase in her hand, hurrying to the pole which marked the stopping place, is entitled to assume that the car will be stopped. (Brott v. Auburn & Syracuse Electric Railroad, 115 Northeastern Rep., 273.)

NEW YORK.—*Workmen's Compensation Act—"Hazardous Business."*

A street surface railroad is engaged in a "hazardous business," under the workmen's compensation law (Consol. Laws, chap. 67; Laws 1914, chap. 41). A street railway conductor, temporarily relieved of duty, who was riding back on a car to his work, who left the car and in crossing the street was killed by his employer's street car, was not at the time, within workmen's compensation act, Sec. 3, Subd. 4, engaged in a hazardous employment. (McCabe v. Brooklyn Heights Railroad, 162 New York Sup., 741.)

Personal Mention

William Mittendorf, assistant chief engineer of the Cincinnati (Ohio) Traction Company, has been appointed chief engineer, succeeding Thomas Elliott. Mr. Mittendorf has been acting chief engineer for three years during Mr. Elliott's connection with the Cincinnati Car Company.

W. S. Murray, the engineering firm of McHenry & Murray, New Haven, Conn., having been dissolved by mutual consent, will hereafter devote his entire time and attention to the interests of the Housatonic Power Company, of which he is president. Mr. McHenry will retire to private life.

Thomas Elliott, chief engineer of the Cincinnati (Ohio) Traction Company, becomes consulting engineer of the company. Mr. Elliott has been vice-president and general manager of the Cincinnati Car Company for about three years, but retained his title of chief engineer of the traction company.

Niles Persons, for the last four years assistant master mechanic of the United Traction Company, Albany, N. Y., who resigned to accept a position with the New York State Railways, Rochester Lines, was presented on May 5 with a gold watch and chain, and an Elk's charm with a genuine elk tooth by the employees of the mechanical department of the company at Albany.

S. R. Bertron, banker and financier, has been appointed a member of the commission to Russia by President Wilson. Mr. Bertron is connected with the firm of Bertron, Griscom & Company, New York, N. Y., which is largely interested in the United Gas & Electric Corporation, the New Orleans Railway & Light Company, the International Railway and other public utility properties.

G. N. Brown and **H. S. Johnson**, superintendent of transportation of interurban lines and engineer of maintenance of way, respectively, of the New York State Railways, Utica Lines, departed on May 14 to attend the Officers' Reserve Corps Training Camp for three months at Sacket Harbor, N. Y. Mr. Brown is also electrical engineer of the Syracuse and Utica lines of the company.

Arthur V. Gardiner has been appointed superintendent of track for the Rhode Island Company, Providence, R. I., succeeding H. F. Purrington, who accepted a position with the Connecticut Company. Mr. Gardiner was engaged in trolley line construction for three years prior to 1908 when he entered the construction department of the New York, New Haven & Hartford Railroad. Since 1913 he has been a resident engineer of the Rhode Island Company.

Charles O. Warfel, superintendent of the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., has received leave of absence to attend the officers' training camp at Fort Benjamin Harrison, and the following readjustment of duties has been made to cover this change: L. W. Henry, chief clerk for the president, will also be acting superintendent, with headquarters at Indianapolis. J. L. Jackson, formerly agent at Greensburg, Ind., will be made traveling freight agent and assistant to L. W. Henry. These changes are effective at once.

Perry R. McComas has been appointed superintendent of railways of the Northwestern Ohio Railway & Power Company, Toledo, Ohio, with jurisdiction over all transportation employees. Mr. McComas is a native of Illinois. He spent the major part of his career in the steam railroad field, beginning as a telegraph operator for what is now the Chicago & Alton Railroad. Following a five-year connection as station agent for the Chicago, Peoria & St. Louis Railroad he was chief train dispatcher for the Illinois Terminal Railroad and later for the Litchfield & Madison Railway and then he served nearly seven years as train dispatcher and chief clerk to the general superintendent of the Toledo, Peoria & Western Railway. For the past six years Mr. McComas has been chief train dispatcher and car accountant of the Peoria (Ill.) Railway Terminal Company, a subsidiary of the Illinois Traction System. His headquarters are now at Genoa, Ohio.

Alvah Seaman has been made superintendent of the trolley lines of the Long Island Railroad, New York, N. Y., succeeding J. P. Kineon. Mr. Seaman was born in 1863 in Pike County, Pa., where he received his early education in the public schools. At the age of twelve he entered the telegraph office of the Pennsylvania Coal Company at Hawley, Pa., and five years later was employed by the Western Union at Scranton. His connection with the Long Island Railroad dates from 1882, when he was employed as telegraph operator at East New York, now a part of Brooklyn. Mr. Seaman's services have merited several promotions, first to train dispatcher at Woodhaven Junction, and then station master located at Long Island City. In 1906 he became assistant trainmaster in charge of time-tables. His headquarters are now at Far Rockaway, and the roads of which he is superintendent are the Ocean Electric Railway, the Huntington Railroad, the Nassau County Railway, the Glen Cove Railroad and the Northport Traction Company, all controlled by the Long Island Railroad.

C. W. STOCKS

Carl W. Stocks, who for the last seven years has been statistician of the American Electric Railway Association, has been appointed general passenger agent of the Bay State Street Railway, with headquarters at Boston. In his new position Mr. Stocks will work in co-operation with R. M. Sparks, formerly general passenger and advertising agent and now assistant to the general manager. This position will give him an excellent opportunity to apply the experience which he has gained in his statistical investigations for the association members. In returning to the railway field in Massachusetts he will not be upon ground entirely unfamiliar as he was for two years, between 1907 and 1909, an inspector in the overhead line department of the Boston & Northern Street Railway, a company which now forms part of the Bay State system. Mr. Stocks was graduated from the electrical engineering course at the Worcester (Mass.) Polytechnic Institute in 1907. As a senior he had a year's contact with Prof. A. S. Richey, who in 1906 resigned his position as chief engineer of the Indiana Union Traction Company to become a member of the faculty of the Institute. After graduation Mr. Stocks was employed by the Boston & Northern as already mentioned, and in 1909 became assistant to the master mechanic in the Everett Mills at Lawrence, Mass. The textile industry, however, did not appeal to him. He, therefore, welcomed the opportunity in 1910 to become assistant to H. C. Donecker, secretary of the American Electric Railway Association, and has been continuously with the association since that year. As he became familiar with the opportunities afforded by the association work Mr. Stocks took on one responsibility after another until he was editing and publishing the *Proceedings*, writing and revising the *Engineering Manual*, acting as head of the Information Bureau, and in other ways proving useful to the industry.

On April 14 the Toledo *Times* praised Henry L. Doherty, chairman of the board of the Toledo Railways & Light Company, Toledo, Ohio, for the energy that he has shown in connection with the effort to settle the franchise situation there. The paper said: "It is worthy of observation that while the 'street car commission' has been extracting from Mr. Doherty information on how to run a street railway system, he has been going ahead constructively. The new power plant on the East Side is going to be a model of its kind. It is characteristic of Mr. Doherty that whatever he undertakes he does well. The addition to the city's lighting and traction facilities will be increased many fold, meeting the requirements of the present and the needs of the future. His energies here merely parallel his energies in the other cities in which he operates. He fits in with the community and aims to be a vital part of it."

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Marion (N. Y.) Railway Corporation.**—Incorporated to maintain and operate electric railways. Capital stock, $100,000. Incorporators: Claude N. Jagger and Charles L. Seybold, Marion, and James D. Bashford, Lyons.

FRANCHISES

Terre Haute, Ind.—The Terre Haute, Indianapolis & Eastern Traction Company has received a franchise from the Board of County Commissioners of Sullivan County to extend its power lines to the mines of the Vandalia Coal Company.

New York, N. Y.—The New York & Long Island Traction Company has asked the Public Service Commission for the First District of New York for permission to discontinue the operation of its line in Rockaway Road and Broadway, between Liberty Avenue and Grant Avenue, Queens, and also to abandon the franchise it holds for routes not yet constructed between Queens and Jamaica and in Jamaica. In its application to the commission for permission to abandon the above routes and franchises, the company states that operation over these thoroughfares is no longer necessary because of the construction of the Liberty Avenue extension of the Fulton Street elevated line.

TRACK AND ROADWAY

Little Rock Railway & Electric Company, Little Rock, Ark.—This company proposes to construct an extension of its line on Pike Avenue from Eighth Street to Eighteenth Street.

San Francisco, Napa & Calistoga Electric Railway, Napa, Cal.—Work will soon be begun by this company on improvements to its roadbed in Sonoma Street, Vallejo. New ties will be installed and new pavement laid between and on either side of the tracks.

Connecticut Company, New Haven, Conn.—The City Council of Rockville has ordered the Connecticut Company to relocate its tracks on Grove Street. It is estimated that the work will cost about $9,000.

Waterbury & Bristol Tramway, Waterbury, Conn.—A survey will be begun at once by William G. Smith, Waterbury, Conn., of this company's proposed line between Bristol and Waterbury. It is expected that construction work will be begun in August. The following officers have been elected: Frederick N. Manross, Bristol, president; Richard Elliott, Southington, treasurer, and John H. Cassidy, secretary of the Waterbury & Milldale Tramway, Waterbury, secretary. Directors: Frederick N. Manross, Richard Elliott, John H. Cassidy; John R. Hughes, Waterbury, and Irving I. Ingraham, Bristol. [Dec. 23, '16.]

Waterbury & Milldale Tramway, Waterbury, Conn.—An amendment has been made to the charter of the Waterbury & Milldale Tramway providing for an extension of the company's lines for about 3 miles in the southeastern section of Waterbury.

Chicago (Ill.) City Railway.—An agreement has been reached between this company and the Chicago, Rock Island & Pacific Railway whereby the Chicago City Railway may finish its crossing at 111th Street and provide service to and from Morgan Park and various cemeteries near Morgan Park.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—Actual construction work has been begun by this company on the building of the extensions of its lines in Waukegan, Ill. The work was begun at the intersection of Grand Avenue and the west line of the North Shore interurban line, where a track 500 ft. long will be located. The switch will be placed into immediate use and will be operated for the handling of the material for the work of extending the lines on North Avenue and Glen Flora Avenue. The initial switch will become a part of the line on Glen Flora Avenue which will connect the West Side line with the tannery. The plans of the company include an expenditure of $150,000 in Waukegan for permanent improvements and reconstruction.

La Salle County Electric Railroad, Ottawa, Ill.—Plans are being made to revive the project to construct a line from Ottawa to Mendota. The Potapsco Engineering Company is said to be willing to go ahead with the work as soon as the preliminary matters pertaining to the right-of-way are established and to carry out the work on the basis of accepting as its pay a considerable proportion of the securities of the railway. The line has been graded for 25 miles. W. C. Vittum, Ottawa, is interested. [July 22, '16.]

Illinois Traction System, Peoria, Ill.—The installation of an interlocking plant for the crossing of this company's line with that of the Lake Erie & Western Railroad at East Peoria has been recommended.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company has received permission from the Board of Public Works to construct an additional track in Martindale Avenue from the tracks of the Indianapolis Union Railway to Twenty-fifth Street to facilitate the handling of troops to Fort Benjamin Harrison.

Wichita-Walnut Valley Interurban Railway, Wichita, Kan.—Right-of-way is being secured by this company for its proposed line from Wichita through the oil fields to Augusta, Douglass and El Dorado. The capital of the company will be increased from $1,000,000 to $1,500,000. T. C. Coffman, secretary. [May 5, '17.]

Trenton, Lakewood & Seacoast Railway, Trenton, N. J.—The directors of the Trenton, Lakewood & Seacoast Railway have announced that work will be rushed on its line from Point Pleasant to Lakewood. Tracks have been laid as far as Laurelton. George O. Vanderbilt, Trenton, is interested. [Nov. 18, '16.]

International Railway, Buffalo, N. Y.—A bill has been passed by the State Senate granting a two-year extension of time to the Frontier Electric Railway, owned by the International Railway, in which to construct its proposed line between Niagara Falls and Buffalo.

Ohio Electric Railway, Cincinnati, Ohio.—The construction of an extension to Defiance and the erection of a passenger and freight station in that city are being considered by the Ohio Electric Railway.

Gallipolis & Northern Traction Company, Gallipolis, Ohio.—This company reports that it may construct about 1 mile of new track.

Youngstown & Suburban Railway, Youngstown, Ohio.—Plans are being made to double-track most of this company's line and to construct an extension from Columbiana to East Palestine, 8 miles.

***Muskogee, Okla.**—Announcement has been made by Mayor J. E. Wyand of Muskogee that an electric interurban railroad between Muskogee and Oklahoma City crossing another between Henryetta and Tulsa at Okmulgee is proposed by Oklahoma City capitalists who have practically consummated their plans.

Oregon Electric Railway, Portland, Ore.—A contract has been awarded by the Oregon Electric Railway to Grant, Smith & Company, Portland, for the erection of trestle approaches to the bridge to be built over the Willamette River at Wilsonville, Ore. The trestle will be 2600 ft. long and will cost about $60,000.

Easton (Pa.) Transit Company.—Work has been begun by the Easton Transit Company on the double-tracking of its line between Bethlehem and Easton.

Philadelphia, Pa.—Sealed proposals will be received by the Department of City Transit, Philadelphia, Pa., William S. Twining, director, until May 22, for contract No. 521, including concrete track floor, cast-iron and steel floor drains and reinforced concrete slab footwalks for the Frankford Elevated Railway from Callowhill to Indiana Streets, about 15,680 lineal feet of structure; contract No. 522, concrete track floor, cast-iron and steel floor drains and reinforced concrete slab footwalks for the Frankford Elevated Railway from Indiana to Dyre Streets, about 15,000 lineal feet.

***North Star Electric Railway, Belle Fourche, S. D.**—This company has been organized to construct an electric railway from Belle Fourche to Dickinson, via Scranton. C. A. Johnson, Scranton, N. D., is interested.

Chattanooga Railway & Light Company, Chattanooga, Tenn.—The Chamber of Commerce of Chattanooga, Tenn., looking forward to the near future when 100,000 men will be in training at Fort Oglethorpe, near that city, has asked the Chattanooga Railway & Light Company to expedite construction of a short line planned from the city to Chickamauga Park. This short line is planned to supplement another which already reaches the park. It would give a second trolley connection and supplement the connection provided by the Georgia Central Railroad.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—Work has been begun by the Salt Lake & Utah Railroad on the construction of an extension from Hunter to Pleasant Green, about 9 miles. The cost is estimated at about $300,000.

Rutland Railway, Light & Power Company, Rutland, Vt.—Work has been begun by the Rutland Railway, Light & Power Company relaying the ties and graveling the tracks of its main line from Rutland to Poultney.

Aberdeen, Wash.—Representatives of Sanderson & Porter of New York, who have been assigned a part in the government shipbuilding work, have been investigating prospective yards in Grays Harbor, Wash., for the past few days. Five sites, two in Hoquiam and three in Aberdeen, have been under consideration. Sanderson & Porter own the Grays Harbor Railway, Light & Power Company, connecting Aberdeen with Cosmopolis and Hoquiam.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—This company will construct a line along Avalon Way from West Spokane Avenue and Thirtieth Avenue southwest to West Seattle.

Tacoma, Wash.—The city of Tacoma has received an urgent appeal from Ernest Dolge, Inc., to extend the tideflats line from its present proposed terminus at the Todd Shipbuilding & Construction Company's plant, to Lincoln Avenue, to give service to employees of a lumber mill which is being constructed by Ernest Dolge, Inc. The Council is favorably considering the further extension.

Tacoma Railway & Power Company, Tacoma, Wash.—Following the recent decision of the Public Service Commission of Washington that it has no jurisdiction to relieve public utilities of paving obligations and other franchise burdens, it is stated the Tacoma Railway & Power Company will repave between its tracks on Broadway, St. Helena Avenue and Sixth Avenue, at a cost of $100,000.

SHOPS AND BUILDINGS

Indianapolis & Louisville Traction Railway, Scottsburg, Ind.—This company reports that it has just completed a freight and passenger station at Henryville.

Boston (Mass.) Elevated Railway.—Recommending an underground terminal and a temporary surface station in Everett, the Public Service Commission of Massachusetts on May 14 withheld approval of this company's petition for the erection of a permanent station for the elevated extension upon private land abutting on Broadway and Everett Streets between Chemical Lane and Brickyard Lane. The commission figures that the temporary station would save about $372,000.

Worcester (Mass.) Consolidated Street Railway.—Preliminary designs have been begun by H. R. Whitney, engineer of way and structures, Worcester Consolidated Street Railway, for the construction of a new fireproof carhouse at the intersection of Grove Street and Park Avenue, Worcester. The first section to be built will have a storage capacity of about forty-eight cars and an outdoor storage capacity of 120 cars on yard trackage. The carhouse will probably be erected in 1918.

Detroit (Mich.) United Railway.—The third unit of the Highland Park shops of the Detroit United Railway has been completed and is now in use. This unit is the building which houses the carpenter shop, wood mill, cabinet shop, pipe-fitting department, pattern shop and tinsmithing department. The building is 287 ft. x 238 ft., two stories high, and is of brick and steel construction. It is adjacent to the machine and truck shops and is connected with them by a transfer table permitting the switching of cars from one building to another. The floors of the building are of concrete with a surface of creosote blocks and the roof is constructed of concrete slabs. The east and west walls are practically of glass with mechanically operated windows. The fourth unit to be erected will be a brass foundry. A modern and permanent power and heating plant will complete the layout. More than $1,000,000 will have been expended on the plant when all construction work is completed.

Interborough Rapid Transit Company, New York, N. Y.—Bids will be received by the Interborough Rapid Transit Company at the office of the chief engineer, 165 Broadway, New York City, until May 24, for completion of the passenger station electric lighting and electric heating systems for portions of the Seventh Avenue line, routes 4 and 38; Pelham Bay Park branch of the Lexington Avenue line, route 5, section 15, and routes 19 and 22, sections 1 and 1-A, Lexington Avenue line, route 5. Drawings, proposal blanks, etc., may be obtained at the above office. George H. Pegram, chief engineer.

POWER HOUSES AND SUBSTATIONS

Burlington Railway & Light Company, Burlington, Iowa.—The erection of several transmission lines this year, it is reported, is contemplated by the Burlington Railway & Light Company. One of the proposed lines will connect Burlington with Mediapolis, Morning Sun, Wapello and Winfield; another line will be erected from Burlington to Middletown. Energy will be supplied from the plant at the Keokuk dam to the cities and towns north of Burlington.

Gulfport & Mississippi Coast Traction Company, Gulfport, Miss.—A report from this company states that it will place contracts as soon as possible for equipment to convert boilers now using coal to wood burning. The company is also in the market for machinery to handle slabs and other saw mill refuse.

Kansas City (Mo.) Railways.—This company is considering the construction of a one-story substation, to cost about $7,000.

Butte (Mont.) Electric Railway Company.—This company plans the immediate construction of two substations in Butte, one at the southeast corner of Florence and Major streets; the other at 218 East Center Street. Permits have been issued to the company for putting up both buildings.

Northern Ohio Traction & Light Company, Akron, Ohio.—Fire recently destroyed the Wooster Avenue carhouse and three cars of the Northern Ohio Traction & Light Company. The loss is estimated at about $50,000.

Youngstown & Sharon Street Railway, Youngstown, Ohio.—This company will extend its transmission lines to East Palestine at once.

Reading Transit & Light Company, Reading, Pa.—This company has doubled the coal storage capacity at its West Reading power plant. With the added facilities, the plant will be able to store between 20,000 and 30,000 tons of coal. New fuel-handling machinery of the latest type has been installed. The company has also purchased two new 1000-hp. boilers.

North Star Electric Railway, Belle Fourche, S. D.—This company, which has been organized to construct an electric railway from Belle Fourche to Dickinson, via Scranton, plans to construct a power plant in connection with the project. C. A. Johnson, Scranton, N. D., is interested.

Appalachian Power Company, Bluefield, W. Va.—This company will construct an electric transmission system between Norton, Esserville, Wise and other towns in this section.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Present Business and Economic Conditions*

How War Will Affect Business—What the Manufacturers Should Do—Governmental Support to Assist Manufacturers

By Frank Baackes
Vice-President and General Sales Manager American Steel & Wire Company, Chicago, Ill.

We are confronted at this time with a very intense political and economical condition, and the two are so intimately connected that they cannot any longer be treated separately as to their consequences. Our political condition has been somewhat clarified by our entrance into the war, but our economical condition has become more intensified than ever. Heretofore, we were confronted with one condition, namely, that we sold to the Allies what we felt we could spare. That, however, is absolutely changed to-day, because our entrance into this war makes us immediately an ally to the Allies.

WHERE THE MANUFACTURERS MUST STAND

Now, that is going to make the situation very acute. It is said that this will require only 5 per cent of the steel, 3 per cent of the leather goods, and 30 per cent of other goods. But when that 5 per cent is required during a time that the demand is 150 per cent and the capacity 100 per cent, then it is evident how far-reaching that condition must be to this nation. This situation is going to affect our domestic business, and the slogan of every manufacturer and of every merchant from now on must be the Allies and our own government first, domestic trade second, and export trade third. That will mean that we must be passive. Also, that this is a time to control our selfishness. And if we are all going to use common sense and distribute our products intelligently and conservatively from what is left, we probably all can have material with which to do business. We must be very conservative, and I cannot put that too strongly before you.

I do not believe that prices should be advanced now unless it is absolutely necessary. I do not believe in a policy of selling the government on one hand at a very low price, and then trying to tax the individual at an advanced price, thereby making the other fellow pay for your patriotism. We have permitted a great many infractions of our usual customs of doing business, but in war time, when everything is tense, when everything is high, everyone must make preparations to shoulder his own burden and not try to shove it on to others.

WHAT BUSINESS NEEDS

We have also to look at the future and what we must do to hold our prosperity, and that means an industrial preparedness, because industry is the life and backbone of a nation, and the greatest boon to its people. That means that our government henceforth must become linked absolutely with business. This country must become one vast business organization. That means that government and business absolutely have to work together for national development and the uplift of the people.

Another thing that we need for the future is an amendment or an abolishment of our Sherman anti-trust law—and all of the anti-trust laws.' And I insist and demand that for the reason that if co-operation, which is desired to-day by the government and by the people, is an absolute necessity in case of war, it must be of great benefit in time of peace. I do not want business not to be regulated, I do not want business to do as it pleases, but I do want business to have liberty within the freedom of the law.

LET'S HELP THE RAILROADS

There is another thing we need, and that is our railroads. Our railroads have been legislated to death. Our railroads need the support of our government and the trade, and they have not got it. And surely if you could not make any money in your business, and it wasn't paying satisfactory dividends to your stockholders, you would not invest any more money in it. Therefore, can you blame the railroads, and can you blame the people for not investing their money in railroads when the return is so much fraught with dangers? Let us help the railroads get proper recompense so that they can be with us in the development of the country.

GOVERNMENTAL ASSISTANCE IS NEEDED

Another thing we need in this country in the future is export trade. We have had a taste of it and we like it. But in order to keep that export trade we need also governmental assistance, and we need it quickly. We must not fool ourselves, just because we are enjoying a large export trade to-day which was forced upon us by circumstances, that these same circumstances will keep it with us. Far from it. And unless we prepare and fortify our manufacturers with the necessary instruments to do this export trade we won't have any. The first thing we need is the passage of the Webb bill, because it legalizes co-operation. Of course, we have many large factories in this country that are strong enough to undertake to seek export markets, but we do not want only conditions that large concerns can enjoy. We want conditions that are equal to all.

Ties Purchased in 1915

Oak, Including Red and White, Supplied More Than 50 Per Cent of Total Reported Purchased

Statistics that have been compiled by the Government Forest Service on the ties purchased during 1915 in the United States by the steam railroads, electric railways, light, heat and power companies, show that fewer ties were purchased in 1915 than in any year since 1907.

Table I shows the number of ties purchased each year from 1907 to 1911, and for the year 1915, classified according to kinds of wood and arranged in the order of number purchased during 1915. Statistics were not obtained for the years 1912, 1913 and 1914.

Five kinds of wood supplied over 81 per cent of the total number of ties reported purchased in 1915. These were the

TABLE I—NUMBER OF CROSSTIES REPORTED PURCHASED, 1907, 1909 TO 1911 AND 1915, BY KINDS OF WOOD

Kind of Wood	1915	1911	1910	1909	1907
All kinds....	*97,106,651	135,053,000	148,231,000	123,751,000	153,703,000
Oak	49,333,881	59,508,000	68,382,000	57,132,000	61,757,000
South'n pine	14,115,681	24,265,000	26,264,000	21,385,000	34,215,000
Douglas fir..	6,950,910	11,253,000	11,629,000	9,067,000	14,525,000
Cedar	5,122,103	8,015,000	7,305,000	6,777,000	8,954,000
Chestnut ...	4,548,352	7,542,000	7,760,000	6,629,000	7,851,000
Cypress	4,478,612	5,857,000	5,396,000	4,589,000	6,780,000
E. tamarack	2,606,794	4,138,000	5,163,000	3,311,000	4,562,000
W. yellow p.	1,402,836	2,696,000	4,612,000	6,797,000	5,019,000
Lodgepole p.	1,316,819	....	....	....	....
West'n larch	1,251,304	....	....	....	....
Beech	1,173,490	1,109,000	798,000	195,000	52,000
Maple	1,069,547	1,189,000	773,000	158,000	....
Hemlock	859,662	3,686,000	3,468,000	2,642,000	2,367,000
Redwood ...	563,685	1,820,000	2,165,000	2,088,000	2,032,000
Gum	485,466	1,293,000	1,621,000	378,000	15,000
Birch	465,815	....	....	....	....
All other....	1,361,694	2,682,000	2,895,000	2,603,000	5,574,000

*Mileage of railroads reporting ties represent 78.46 per cent of total mileage. Mileage represented for former years not obtainable.

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*Abstract of address recently presented before a joint assembly of the National Hardware Manufacturers' Association and the Southern Hardware Jobbers' Association.

oaks, southern pine, Douglas fir, cedar, and chestnut. While there appears to be no trend toward the use of any one species, more oak was reported than any other kind of wood. This is doubtless due to the fact that oak has the requisite strength and hardness for ties and is available in many localities in large quantities. Oak, including both red and white, supplied 49,333,881 ties, or 50.8 per cent of the total number reported purchased. Yellow pine was second in importance, contributing 14,115,681 ties, or 13.43 per cent of the total number reported. This species is largely used because of its availability and cheapness, and in the case of longleaf pine, because of its durability, also the strength of longleaf pine adds to its desirability.

Table II shows the number of crossties reported purchased by the steam railroads, electric railways, and light, heat and power companies. The total number of crossties reported purchased during 1915 by the steam railroads was 88,498,655, or 91.1 per cent of the total reported by all classes of purchasers.

Table II—Number of Crossties Reported Purchased in 1915, by Classes of Purchasers and Kinds of Wood

Kind of Wood	Total	Steam Railroads	Electric Railways and Power Companies
All kinds	97,106,651	88,498,655	8,607,996
White oak	32,461,555	30,160,316	2,301,239
Red oak	16,872,326	15,989,605	882,721
Southern pine	14,115,681	13,226,654	889,027
Douglas fir	6,950,910	6,308,685	642,225
Cedar	5,122,103	4,121,570	1,000,533
Chestnut	4,548,352	2,666,402	1,881,950
Cypress	4,478,612	4,375,012	103,600
Eastern tamarack	2,606,794	2,520,475	86,319
Western yellow pine	1,402,836	1,183,535	219,301
Lodgepole pine	1,316,819	1,254,420	62,399
Western larch	1,251,304	1,196,415	54,889
Beech	1,173,490	1,139,457	34,033
Maple	1,069,547	1,062,086	7,461
Hemlock	859,662	839,924	19,738
Redwood	563,685	270,694	292,991
Gum	485,466	485,466	....
Birch	465,815	462,462	3,353
All other	1,361,694	1,235,477	126,217

The number of ties purchased by the electric railways and light, heat and power companies amounted to 8.87 per cent of the total, a decrease of 281,000 ties in comparison with the number purchased by these companies in 1911. The greater part of those reported were white oak, cedar, and chestnut. Southern pine and red-oak ties were purchased in nearly the same quantities, while fewer birch ties than any other were separately reported.

New Hydroelectric Construction in France

William H. Cole in This Country to Place Orders for the Required Machinery

William H. Cole, engineer for the Union Passenger Railway Company of Richmond at the time of its electrical equipment in 1888, but for most of the time since practicing engineering abroad, is in this country, in charge of three undertakings in which the French government is indirectly interested.

One of these projects is in connection with proposed hydroelectric work in the French Alps and Pyrenees, a development made desirable at this time by the scarcity of coal in France. This work will be undertaken by the Société d'Hydraulique Foncière et Industrielle, recently organized in Paris with a paid-up capital stock of 25,000,000 francs. According to Mr. Cole, most of the hydroelectric machinery required in the developments now to be undertaken by this company will be purchased in America. Allied with this company is a second corporation, the Société Centrale d'Industrie, whose purpose will be to distribute and use this power. The water power first developed will be in the Alps, and part of it will be used for the operation of sections of the Midi Railway. Both of these companies hold franchises for 100 years, granted by the French government.

A third mission being undertaken by Mr. Cole on this trip is in connection with the rehabilitation of the portions of northern France and Belgium retaken from the Germans. This undertaking will be carried out by an organization known as the American Bank Franco-Belgique.

Mr. Cole is a member of the A. I. E. E., and his professional work in the past has included active connection with electric railways in Rio de Janeiro, Buenos Ayres, Mexico City and Singapore.

Large Size Catalog Favored

By F. V. Burton

Eastern Sales Manager Byrant Electric Company,
Bridgeport, Conn.

I am glad to see so much interest in the discussion which is going on in your columns with reference to standard catalog sizes because it indicates very clearly that a standard is desired, and the more agitation on the subject there is the sooner standardization will come.

Our standard catalog is 8 in. x 10½ in., which is the size recommended by Mr. Rice, manager of the publication bureau of the General Electric Company in his article on page 808 of your issue of April 28. The reasons which he sets forth are among those which influenced us in dropping the 6-in. x 9-in. size in favor of the 8-in. x 10½-in. size. Then there is an additional reason, which is important with those manufacturers who, like ourselves, make shelf goods. This is that the same plates used for printing a bound 8-in. x 10½-in. catalog can be used satisfactorily for printing on the 8-in. x 10½-in. sheets of the loose-leaf catalog that is issued by the Electrical Supply Jobbers' Association to its members. As the catalog would probably have a border, it is possible, by omitting the border, to leave a 2-in. margin at the binding edge, which is necessary in a loose-leaf book of this character to prevent the reading matter from being concealed or difficult to read in the fold of the book.

Of four manufacturers in our line of business who have issued catalogs during the past year, three have for the first time used the 8-in. x 10½-in. size, so that it looks as if the industry was standardizing on this size quite rapidly.

President Names Economy Board

President Wilson has named a commercial economy board of the advisory commission of the Council of National Defense. The members of this board are Edwin F. Gay, professor of economics at Harvard; Wallace D. Simmons of St. Louis, George Rublee of New Hampshire, Henry F. Dennison of Massachusetts, Dr. Horace Godfrey and A. W. Shaw of Chicago, chairman. The board is organized to assist the readjustment of distribution during the war by securing the voluntary co-operation of business men in adopting more efficient methods and in cutting down waste. One of the chief objects is to assist commercial houses in releasing employees for the government service without dislocating business.

Electric Properties Corporation

The Electric Properties Corporation, at a special meeting of the stockholders held on May 7, approved the action of the board of directors in taking over the property and business of Westinghouse Church Kerr & Company. The changing of the name of the Electric Properties Corporation to that of Westinghouse Church Kerr & Company, Inc., was also approved. The notice calling the special meeting of stockholders stated that the change in name was for the purpose of effecting economies, particularly in the saving of payment of double federal income and surplus profits taxes.

Gear Manufacturers Meet

The American Gear Manufacturers' Association, the organization of which was noted in the Electric Railway Journal of April 7, held its second meeting at the Hotel Schenley, Pittsburgh, on Monday and Tuesday, May 14 and 15. The meeting was well attended, there being about twenty gear manufacturers represented.

Papers were presented by the following: S. L. Nicholson, Westinghouse Electric & Manufacturing Company, on "The Ins and Outs of an Industry Organization"; James E. Gleason, Gleason Works, on "The Spiral or Curved Tooth Beveled Gear"; Frank Burgess, Boston Gear Works, on "Industrial

Mill or Job Gearing," and William Ganschow, William Ganschow Company, on "The Advantages of Gear Standardization."

Steel Orders Piling Up

The books of the United States Steel Corporation show that on April 30 there were unfilled orders amounting to 12,183,083 tons. This total makes a new high record and is an increase of 471,439 tons over the tonnage shown at the end of March. The increase in the figures for April was more than was expected. The total of unfilled orders on hand at the end of last month compares with a finished steel capacity of 16,080,000 tons annually. The following table gives the unfilled tonnage at the close of the first four months of each year for 1915, 1916 and 1917:

	1917	1916	1915
January	11,474,054	7,922,767	4,248,571
February	11,576,697	8,568,966	4,345,371
March	11,711,644	9,331,001	4,256,749
April	12,183,083	9,829,551	4,162,244

NEW YORK METAL MARKET PRICES

	May 3	May 19
Prime Lake, cents per lb	31	31½
Electrolytic, cents per lb	31	31½
Copper wire base, cents per lb	36	36
Lead, cents per lb	9⅞	10½
Nickel, cents per lb	50	50
Spelter, cents per lb	9½	9⅜
Tin, Straits, cents per lb	58½	65½
Aluminum, 98 to 99 per cent, cents per lb	60	60

OLD METAL PRICES

	May 3	May 19
Heavy copper, cents per lb	24½	25
Light copper, cents per lb	21½	22
Red brass, cents per lb	18½	18½
Yellow brass, cents per lb	17½	17½
Lead, heavy, cents per lb	7¾	8
Zinc, cents per lb	7	7
Steel car axles, Chicago, per net ton	$41.50	$41.50
Iron car wheels, Chicago, per gross ton	$24	$25.50
Steel rail (scrap), Chicago, per gross ton	$31.50	$31.50
Steel rail (relaying), Chicago, per gross ton	$39	$39
Machine shop turnings, Chicago, per net ton	$11.00	$11.50

CURRENT PRICES FOR MATERIALS

	May 3	May 19
Rubber-covered wire base, New York, cents per lb.	36½	36½
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable stranded, New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40	$40
Rails, heavy Bessemer, Pittsburgh, per gross ton.	$38	$38
Wire nails, Pittsburgh, per 100 lb	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.85	$3.85
Steel bars, Pittsburgh, per 100 lb	$4.00	$4.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$6.35	$6.70
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$7.55	$7.55
I-beams over 15 in., Pittsburgh, cents per lb	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$4.15	$4.15
Cement (carload lots), New York, per bbl	$2.12	$2.12
Cement (carload lots), Chicago, per bbl	$2.16	$2.16
Cement (carload lots), Seattle, per bbl	$2.60	$2.50
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.21	$1.28
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.22	$1.29
White lead (100 lb. keg), New York, cents per lb.	10¾	11¼
Turpentine (bbl. lots), New York, cents per gal.	52	47

ROLLING STOCK

North Kankakee Electric Light & Railway Company, North Kankakee, Ill., is reported to be in the market for two cars.

Carbon Transit Company, Mauch Chunk, Pa., is reported to be in the market for cars.

Halifax (N. S.) Electric Tramway Company, Canada, is in the market for additional rolling stock, rails, ties and general construction material.

Tampa (Fla.) Electric Company is having fifteen double-end pay-as-you-enter one-man safety cars built for it in the shops of the American Car Company, St. Louis, Mo.

Gary & Interurban Railroad, Gary, Ind., is expected to place an order for two motor and four trail cars within the next week.

Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa, noted in the April 21 issue as being in the market for fifteen city cars, has placed this order with the American Car Company.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has placed an order with the G. C. Kuhlman Company for three Peter Witt cars.

Mason City & Clear Lake Railroad, Mason City, Iowa, noted in the April 21 issue as being in the market for three cars, has placed this order with the American Car Company.

Houston (Tex.) Electric Company, noted in the May 12 issue as having eighteen single-end pay-as-you-enter one-man safety cars built for it by the American Car Company, has specified the following details for this equipment:

Number of cars ordered	18
Builder	American Car
Type	One-man safety
Seating capacity	36
Length over bumpers,	27 ft. 9½ in.
Length over vestibule,	26 ft. 9½ in.
Width over all	8 ft. 0 in.
Rail to trolley base	12 ft. 6 in.
Body	Semi-steel
Interior trim	Statuary bronze
Headlining	None, rafter finish
Roof	Arch
Air brakes,	Safety Car Devices Company
Axles	Brill
Bumpers,	American Car-channel iron
Car trimmings	Brill
Couplers	None, pull bars used
Curtain material	Pantasote
Designation signs	Hunter
Door mechanism	Safety Car Devices Co.—air-operated
Hand brakes	American Car—with Pittsburgh ratchet drop brake handles
Headlights	Golden Glow S-M-95
Journal boxes	Brill
Sanders	Keystone air sanders
Sash fixtures	O. M. Edwards
Seats, style	Heywood Bros. & Wakefield 57-S-P
Seating material	Mahogany wood, steel and canvas lined rattan
Springs	Brill
Step treads	Feralun
Trolley catchers	Keystone
Trucks, type	Brill 78-M-1 Special
Ventilators	Utility Ventilators
Wheels	24 in. diam., 2½ in. tread, ⅝ in. flange
Special devices	Faraday high voltage push button system

New York State Railways, Rochester Lines, Rochester, N. Y., noted in the March 24 issue as purchasing twenty-five 50-ft. Peter Witt cars from the Cincinnati Car Company through W. R. Kerschner, has specified the following details for this equipment:

Number of cars ordered	25
Date of delivery	September, 1917
Builder	Cincinnati Car
Type	Peter Witt
Seating capacity	53
Weight (total)	31,900 lb.
Bolster centers	26 ft. 0 in.
Length over bumpers	50 ft. 0 in.
Width over all	8 ft. 4 in.
Rail to trolley base	11 ft. ⅛ in.
Body	Steel
Interior trim	Cherry
Headlining	Steel
Roof	Arch
Air brakes,	Westinghouse DH.-10
Axles	Forged annealed steel
Bumpers	Channel irons
Car trimmings,	Railway Company standard
Conduits and junction boxes,	Alphaduct
Control	GE..K-12 with magnetic line switch
Couplers	Drawheads with bars
Curtain fixtures	Curtain Supply, grooved ring fixture
Curtain material	Pantasote
Designation signs	Hunter
Door mechanism,	National Pneumatic
Fare boxes	Cleveland
Fenders	Eclipse
Gears and pinions	GE. grade M.
Hand brakes	Cincinnati Car
Heaters	Peter Smith hot air
Headlights	Trolley Supply Co.
Journal Boxes	Taylor
Lightning arresters	GE.
Motors,	Four GE. No. 258 inside hung
Registers	None
Sanders	Railway Co.'s standard
Sash fixtures	Edwards
Seats, style	Transverse at read end, longitudinal front end
Seating material	Fabrikoid
Springs	Taylor
Step treads	Metal
Trolley catchers	Not yet ordered
Trolley base	GE.
Trolley wheels	Lumen
Trucks, type	Taylor RH.
Ventilators	Not yet decided
Wheels	26 in., cast iron

Puget Sound Traction, Light & Power Company, Bellingham, Wash., noted in the March 24 issue as having had four double-end one-man pay-as-you-enter safety cars purchased for it by Stone & Webster, Boston, Mass., has specified the following details for these cars. Details for twenty-eight single-end cars ordered for the Tacoma properties were reported in the April 28 issue.

Number of cars ordered	4
Builder	American Car
Type	One-man safety
Seating capacity	34
Length over bumpers,	27 ft. 9½ in.
Length over vestibule,	26 ft. 9½ in.
Width over all	8 ft. 0 in.
Rail to trolley base	12 ft. 6 in.
Body	Semi-steel
Interior trim	Statuary bronze
Headlining, None	Rafter finish
Roof	Arch
Air brakes,	Safety Car Devices Company
Axles	Brill
Bumpers,	American Car channel iron
Car trimmings	Brill
Control, type	G.E. K-10
Couplers	None, pull bars used
Curtain material	Pantasote
Designation signs	Hunter
Door mechanism	Safety Car Devices Company, air-operated
Fare boxes	Johnson, Model D
Fenders	Furnished and installed by railway
Gears and pinions	GE.
Hand brakes	American Car, with Pittsburgh ratchet drop handle
Headlights	Golden Glow, S. M. 95
Journal boxes	Brill
Lightning arresters	GE.
Motors	Two G.E., 258 C., inside hung
Sanders	Keystone air sander
Sash fixtures	O. M. Edwards
Seats, style	Heywood Bros. & Wakefield
Seating material	Mahogany wood, steel and canvas lined rattan.
Springs	Brill
Step treads	Feralun
Trolley catchers	Keystone
Trolley base	GE.
Trolley wheels	GE.
Trucks, type	Brill, 78-M-1, special
Ventilators	Utility ventilator
Wheels	24-in. diam., 2½-in. tread, ⅝-in. flange
Special devices	Faraday high voltage push button system, ESS. Co.

TRADE NOTES

Philadelphia (Pa.) Holding Company has received an order from the Hutchinson (Kan.) Interurban Railway for one radial truck.

George W. Neff has taken charge of the Eastern management of the John H. McGowen Company of Cincinnati, Ohio, with offices at 50 Church Street.

General Electric Company, New York, N. Y., is moving its entire offices from 30 Church Street to the Equitable Building, 120 Broadway, where it will occupy the entire twentieth floor.

A. W. Burchard was elected an additional member of the board of directors of the General Electric Company at the annual meeting of the stockholders held on May 8. All of the retiring directors were re-elected.

Frank M. Hawkins, since 1897 managing representative of the New York territory of the Crouse-Hinds Company, will hereafter devote most of his time to export trade. For the present he will investigate the West Indian and the South American trade.

Electrose Manufacturing Company, Brooklyn, N. Y., is distributing a report rendered to the company on a high-voltage test of its insulated connectors, ordered for the W. S. Barstow Company. The tests were made by the Electrical Testing Laboratories.

Packard Electric Company, Warren, Ohio, has established a district office on the fourth floor of the San Fernando Building, Los Angeles, Cal., in charge of J. G. Monahan, district manager. This office will handle all of the territory south of Fresno and also the State of Arizona on all products of the transformer department.

Electric Service Supplies Company, Philadelphia, Pa., recently had a flag raising at its factory which was attended by several hundred employees of the company. The flag, which is illuminated by three Golden Glow floodlighting projectors, was raised after appropriate ceremonies in which all participated.

Bound Brook (N. J.) Oil-less Bearing Company has awarded a contract for a new foundry to be erected at plant No. 2, Lincoln, N. J., which is located 2 miles east of the Bound Brook plant. The new two-story, steel-and-brick building will be 80 ft. x 180 ft. and will be completed by Aug. 1, 1917.

McHenry & Murray, New Haven, Conn., announce that this engineering firm has been dissolved by mutual consent of the partners. Mr. Murray will hereafter devote his entire time and attention to the interests of the Housatonic Power Company, of which he is president, and Mr. McHenry will retire to private life.

Frank W. Marvel, with headquarters in Philadelphia, has been appointed special representative in the Eastern territory for the Indianapolis Switch & Frog Company, Springfield, Ohio. For the past seven years Mr. Marvel has been identified with the Buda Company as sales engineer with headquarters in Chicago.

Railway Track Tamping Machine Company, Lewiston, Me., has recently been organized for making railway track bed machinery. The company is capitalized for $75,000. William P. Barrell is president and C. L. Emerson, treasurer, and these two with Nicola Talarico and H. C. Barrel are directors.

Duquesne Electric & Manufacturing Company, Pittsburgh, Pa., is the new name adopted by the Service Supply & Equipment Company, dealer in second-hand electrical equipment and contractor for electrical repair work. The new company has opened a large repair shop at East Liberty, Pa. The sales offices, however, still remain in the Bessemer Building..

Casey-Moorehead Engineering Company, Pittsburgh, Pa., consulting electrical engineer, has opened offices in the Bessemer Building. The company will furnish appraisals, estimates, reports and specifications on electrical apparatus applied to industrial plants and coal mines. Both Mr. Moorehead and Mr. Casey were formerly with the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

C. P. Donahue has been appointed sales manager of the Electric Materials Company, North East, Pa., effective May 1. Mr. Donahue has been with the company since February, and prior to that he was employed by the Westinghouse Electric & Manufacturing Company at East Pittsburgh for fourteen years, during which period he had several years of practical shop work, the remainder of the time being connected with the sales department.

National Conduit & Cable Company, Inc., New York, N. Y., noted in the April 28 issue as having been reorganized under the laws of New York State with a capitalization of $8,700,000, has elected the following board of directors: Edward S. Perot, Edward S. Perot, Jr., Morton A. Howard, George J. Jackson, Albert H. Wiggin, president Chase National Bank; C. E. Mitchell, president National City Company; Andrew Fletcher, president American Locomotive Company; Stephen Millett of Millett, Roe & Hagen; Robert Montgomery of Montgomery, Clothier & Tyler, and Hugh K. Prichitt of Prichitt & Company. Edward S. Perot is president; Edward S. Perot, Jr., vice-president; Morton A. Howard, secretary, and George J. Jackson, chairman of the board.

Railway Tie Corporation, 2007 Railway Exchange Building, St. Louis, Mo., recently incorporated, has purchased the patent rights on a combined wood and steel tie from the Illinois Railway Tie Company and also on a metallic tie from the National Tie Company. The company has decided to build its own manufacturing plant, as it is impossible to get ties made to fill several large orders now on hand, on account of the congestion in the steel mills. The company also has offices in Chicago, 1531 Lytton Building, and in Philadelphia, 810 Commercial Trust Building. J. H. Stube is president, Chicago, W. F. Sloan, vice-president, Chicago, A. L. Taylor, second vice-president, Harrisburg, Pa.; J. F. Sweeney, treasurer, Chicago; F. W. Burk, secretary, Chicago, and F. A. Swisher, assistant secretary, Philadelphia.

NEW ADVERTISING LITERATURE

American Steel Foundries, Chicago, Ill.: An attractive folder containing a poem, "The Evolution of the Wheel," by A. Trevor Jones.

Stow Manufacturing Company, Binghamton, N. Y.: Copies of miniature bulletins No. 101 and 102 on electric tools and flexible shafts.

B. S. Barnard & Company, New York, N. Y.: Booklet of conduit specialties and tools for removing obstructions in underground conduit systems.

Dielectric Manufacturing Company, St. Louis, Mo.: A catalog on insulation, paints and varnishes. Contains useful curves showing the electrical characteristics of the different insulating materials.

National Tube Company, Pittsburgh, Pa.: Bulletin No. 27 on the uses of National pipe. Contains a sixteen-page section of tables and data about the physical properties of National pipe of interest to the engineer.

John C. Dolph Company, Newark, N. J.: A catalog which will enable the users of insulating varnishes to select the type of varnish most suitable for their apparatus. All varnishes listed under trade names, qualities and characteristics.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Catalog 5A on insulating materials and supplies. Specifications and uses of mica, micarta, bakelite-micarta for gears and pinions; treated and untreated cloths and papers; varnishes, shellacs, cement, glue and switch oil.

General Electric Company, Schenectady, N. Y.: Bulletin No. 47,477 on 45,000 to 70,000-volt type F, form KO-26 oil circuit breakers for outdoor service. This breaker is usually mounted on framework to allow for easy removal of oil vessels with the help of a tank-lifting device. Breakers made with or without bushing type current transformers for indicating or tripping purposes.

Railway Improvement Company, New York, N. Y.—Publication which resembles in appearance a Rico coasting recorder. Explains use of comparative efficiency charts, gives efficiency records, service department figures for all roads on which recorders are installed, announces some recent accessions to the rapidly increasing number of users of coasting recorders, and explains the use of Rico efficiency service in rewarding efficient and skilled motormen.

Electric Railway Journal

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Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Vol. XLIX NEW YORK, SATURDAY, MAY 26, 1917 Number 21

Cable Message from Mr. Dalrymple of Glasgow

Glasgow, May 18, 1917.

To the Electric Railway Journal:

The tramway men of Scotland are extremely pleased that they will soon be fighting shoulder to shoulder with the street railway men of America. During the early weeks of the war our tramway men in Scotland literally sprang to arms, and they have done nobly on every battle front. Three thousand Glasgow tramway men are with the colors. The women in the meantime are holding the fort. Nearly every car in Scotland has now a woman conductor and very soon will have a woman driver.

If the street railway men in America will throw themselves heartily into this struggle, the fight will soon be over. The tramway men of Scotland greet you as comrades in arms.

JAMES DALRYMPLE,
General Manager Glasgow Tramways.

(This cablegram was received from Mr. Dalrymple in reply to a suggestion from the ELECTRIC RAILWAY JOURNAL that a message from him in regard to the war in which Great Britain and the United States are now allies would be appreciated by the electric railway men in this country.)

SOLICIT FREIGHT TO RELIEVE STEAM ROADS

With the onset of war conditions there is certain to be more and more serious interference with the normal progress of freight traffic on the railroads. The causes are manifold—real shortage of rolling stock, cars tied up at ocean terminals in default of proper storage facilities or of shipping, more cars held up deliberately by speculators in foodstuffs waiting to make a quick turn, hasty shipments of great quantities of material to particular and unusual termini. These and other causes make the situation a particularly complicated one, and to this will presently be added the work connected with mobilization and transportation, sending again large quantities of men and material over somewhat unusual routes. Here is an opportunity for the electric roads to develop their freight business and thus help the government as well as the public. But this opportunity to help is not going to be thrust upon the electric railways by a conservative public, no matter what difficulties may be experienced by the shippers over steam railroad routes. If any electric railway is prepared for such service it must get that fact before the public and keep it there. To this end we suggest that special publicity be given to possible routings made altogether over electric lines.

GOVERNMENT AND BUSINESS

The decision of the administration to use expert advertising assistance in setting forth the advantage of the new Liberty Loan to the public is a wise move. Many persons who would not think of arguing their own cases in court or of having anyone except a trained surgeon perform an important operation upon themselves consider any sort of an announcement will do when it comes to advertising. Nothing can be farther from the fact. Advertising is a science, and the decision of the administration to utilize the expert knowledge and existing advertising channels which have been offered to it free, both by the new cards which will be carried in the electric railway cars during the next three weeks and by other methods of advertising the bonds, shows good business sense. The example is one which Congress could well follow, as its latest proposal in regard to the second-class mail rates indicates a fundamental lack of conception of business needs. While various administrative branches of the government are asking the assistance of the business papers in furthering the government plans—an assistance which they are glad to supply and are now supplying—the House seems to be trying to make that service impossible or greatly to restrict its usefulness by an enormous increase in the postage rates.

ADD AUTOMOBILE MERITS TO RAILWAY SERVICE

When a railway finds itself faced by unrestricted or inefficiently restricted jitney competition, it is perfectly natural to point out the unfair advantages enjoyed by the newcomer. But instead of putting the matter up to the public's sense of justice and fair play alone, the railway might well ask itself the question: "What is there wrong about our operation that people should prefer the other means of transit?" This thought is prompted by what we have seen lately in a city where the jitney is still rampant. Restriction after restriction has failed, and now the city is asked by the railway to keep the jitneys off of the main streets during the hours of congestion. It is but fair to say that this company has always given excellent service on short headways, and that its men are most courteous to the public and most loyal to the management. Why, then, does a large portion of the public prefer the jitney? One reason is that it is far easier to get in and out of an automobile than to risk this company's dangerously high car steps. Another is, that the low rate of acceleration plus the low rate of passenger interchange (due to high steps) makes the car speed absurdly low. It would cost a great deal of money to remove these handicaps, but it will cost more to stay behind the times. Regardless of past virtues or past sins, what the people want is good service, and they will inevitably prefer that which proves best for their own comfort and well-being quite regardless of the subtleties of taxation, paving upkeep and the like. The electric railway which wants to remain the carrier of the commonalty must not and cannot overlook the fact that the automobile has created in the public a taste for faster and more pleasing transportation than is offered by the high-step, low-acceleration, many-stop car which is already entering the land of yesterday.

TAXATION TO INCREASE PLATFORM WAGES

Developments in the San Francisco Municipal Railway situation bring out clearly the fact that in this era of rising prices a publicly-owned road is not necessarily a bonanza even when it is operated in choice territory and is well managed. San Francisco is discovering that the nickel of its own railway can no longer stand the strain. Of course, it has been pointed out many times in these columns and elsewhere that if the municipal railway had to carry the same burdens of taxation as its privately-owned neighbor the profits would be largely conjectural. With the latest action of the Board of Works, however, there is a frank declaration of an impassé.

It appears that on Monday, May 7, the Board of Works recommended that the car and shopmen of the Municipal Railway receive an increase of 50 cents a day, namely, from $3.50 to $4 a day. Thomas A. Cashin, superintendent, had previously explained that this increase would cost the city $93,000 a year. As the Municipal Railway had earned only $5,600 net profit between July 1, 1916, and Feb. 28, 1917, the Board of Supervisors (which passes on wage recommendations) is presented the pleasing task of drawing a gallon of wine from a flask holding a gill. As even San Francisco politicians can't do that, the money will have to come out of the 18 per cent of the gross earnings that has been set aside for depreciation, redemption and bonds, or out of the tax levy. In plain English, all of San Francisco's citizens are to be assessed in some form for the sake of some of San Francisco's citizens.

No matter what the outcome, the public will receive a few more important lessons in municipal electric railway economics. It will have to decide eventually whether public utilities are to be run as a business proposition to "relieve the rates," as in England, or as a public highway which may increase realty tax values, but which brings no direct returns. If the latter view should prevail, municipal operation would no longer be comparable with private operation. The barrier interposed by capable management would be broken down, and San Francisco's big-hearted supervisors would run riot with the city's tax and bonding powers.

FARE INCREASES NEED NOT WAIT ON VALUATIONS

Now that the street railway lines of New York City, following their announcement of last week, have filed formal application with the Public Service Commission for a charge of 2 cents on transfers, opposition is appearing. This, of course, was to be expected. With the experiences of the railways in asking rate increases from the Interstate Commerce Commission before the companies, no other result, however serious the situation, could be looked for.

But the character of that opposition, thanks to the frankness with which the railway officials have stated their position, differs from the past. Opponents of the charge on transfers have largely been reduced to one argument, the old argument of valuation. The invitation of President Shonts to the Chamber of Commerce and other civic bodies to examine the affairs of the New York Railways Company before making their decision whether the proposed charge was justified appealed to the public as being fair. As a result, there has been a notable inclination on the part of public-spirited citizens and newspapers to withhold judgment until the facts had been fully presented. This in itself is a distinct victory for the methods pursued by the companies.

The argument for valuation as a basis for the proper determination of fare increases is traditional. It has been met by every railroad, every street railway, every public utility when confronted with the necessity of meeting increasing costs by obtaining additional revenues. And nearly every public service corporation that is subject to commission regulation at some time or another in recent years has had such valuations made.

In New York, both in the city and up-State, the electric railway companies have contended that if disaster to many properties were to be averted, there was no time for valuation. The whole basis of their plea was immediate relief. To wait for one year or two years while tedious inventories were taken would be to summon the doctor after the patient was dead.

One peculiar feature of the situation confronting the companies this year is also overlooked by the valuation advocates. For the companies it is an argument that should have the strength of Macedonian phalanxes. And that is fares based on the value of service.

Assuming that electric car service given five years ago was worth the price charged for it—that is, the same nickel that had bought street car rides since Civil War days—if the ride was worth the nickel then, surely the same ride is worth more now. Otherwise, the buying power of the nickel is the same as five years ago. And the present high prices prevailing in every phase of life refute any such argument.

The point is that those who advance the valuation argument in opposing increased fares or charges for transfers on the electric railways are hiding behind a subterfuge. They are not willing to face the issue squarely. They are seeking to deny elemental justice in a situation where the facts are clear-cut and simple. They are forced to recognize in their own pocketbooks the increased cost of living in every commodity, in every article of food, clothing and material they use.

They see these increases offset to a degree by advances in wage and salary levels.

The electric railway companies must keep pace in all these increases. They must raise wages when other employers raise wages. They must pay more for materials and supplies. And yet, when they ask for commensurate advances in the cost of the commodity which they sell—transportation—they are met with the argument that increases must not be determined by what it costs to operate, but by how much it costs to start the business.

GET CAR MEN INTERESTED IN THE POWER PLANT

The Public Service company section of the American Electric Railway Association last week visited the latest power plant of the Public Service Electric Company. Such an inspection should be very useful to the transportation department of the railway in inaugurating the power-saving campaign which it is planning, for the reason that the inspection will give the men a better conception of what it is that they are expending when they are driving their cars.

There is nothing more intangible than electrical energy, but the coal pile is a perfectly definite, concrete thing. If the platform man, as he manipulates his controller and brake handle, could be brought to consider whether he is saving or wasting coal, as the case may be, he is far more likely to save than if he tries to think of what he is saving in terms of abstract energy. In former editorials we have endeavored to visualize the energy used by a car by stating, for example, that 125 watt-hours (the energy consumed per ton-mile under ordinary city conditions) is equivalent to 166 ft.-tons or 10 hp.-minutes, or that it will light a 20-cp. tungsten lamp for five hours, or that it will raise the temperature of a cubic foot of water about 7 deg. Fahr.

These examples are all right as far as they go, but if it is possible to familiarize the platform man with the power plant itself, especially if the route of the energy from coal pile to feeder line can be pointed out to him in simple language, his co-operation in energy saving should be more easily obtained. He can be made to realize that if he makes a car mileage of, say, 100 per day he controls the consumption of something like 1200 lb. of coal, or considerably more than a half ton per day. By saving 10 per cent of this amount, which is well within his reach, he could reduce the coal consumption by 20 tons per year. As coal is a commodity which everybody has to buy, there is no doubt that a staggering figure like this would appeal to any man intelligent enough to control the destiny of a carload of passengers. It will, therefore, pay every railway manager to interest his men in his own power plant or that from which his road purchases energy.

TIME FOR UNITED ACTION

The responses from public service commissions throughout the country to the general letter sent out by John Nickerson, Jr., asking their attitude on the question of fare increases—noted on another page—are deserving of more than passing attention by officials of all electric railway companies. They carry a message of hope, however slight it may be, for which operators of public utilities have long been waiting.

The question of increased costs, as it relates to street railway fares, at last has forced itself on the commissions. That is plainly the meaning of the responses to Mr. Nickerson's letter. No matter how much the commissions may wish to gain time and plead that they cannot commit themselves until the "question is brought before them," the dilemma of the companies is now squarely up to the regulating bodies. The applications filed by the companies in New York mean that they must make a decision.

With the question which has been worrying operating officials for years thus brought definitely to a head, the duty of all the electric railway companies in the country is clear. The problem is a common problem. It is as vital in California as it is in Maine. New York has led the way with a united stand. The companies of every other state will be forced by economic circumstances to follow with similar applications. They have the consciousness that right is on their side, and they must act. The moment for which they have hoped and prayed has come. And it is now or never!

For, after all, the cause in Illinois is the same as the cause in New York. If a higher fare is needed in Rochester, N. Y., or in Buffalo or Syracuse, or other cities in the State, it is needed in Springfield, Mass., or Erie, Pa. The reasons underlying the necessity for the increase are universal. They are not confined to the electric railway business, but are only part of the general economic conditions brought on by the war.

Electric railway companies are fighting for this increased fare, not merely as part of the right to live, but because only by such increases can the progress of the transportation industry be assured. Business cannot stand still any more than life can. It must either go forward or slip back; and the street railways have always gone forward, from the days of the horse car and through the various transformations which have followed since horses were used. An end, however, has now been reached. Wages, taxes and the cost of materials have become so high, and the lengths of ride have so increased, that there is now nothing left of the nickel. Relief is urgently needed, and Mr. Nickerson's replies may fairly be interpreted as evidence that some of the public service commissions of the country recognize this fact.

SKIP-STOP IN BALTIMORE—The leading article in next week's issue will tell how the United Railways & Electric Company has educated its public to an appreciation of the advantages of the skip-stop plan by showing that it conduces to better service.

Double Guards Reduce Cost

Guards on the Outer Rails of Curves Increase the Life of Rolling Stock and Effect a Considerable Reduction in Maintenance Cost

By **WILLIAM H. STEVENSON**
Engineer Philadelphia (Pa.) Holding Company

THE necessity for the double guarding of rails on curves has been emphasized whenever the writer has interviewed a specialist or an engineer who has scientifically studied the problem of curve conditions. The opinion, however, of many less competent to judge is that the outer guard on curves increases noise and adds friction without giving any benefit other than "to kick the truck around" which, in reality, is necessary as the wheel is kept in the desired position on the rail. In many cases the outer guard has been abandoned merely to cut down the initial cost.

SINGLE GUARDED CURVES PROVE HAZARDOUS

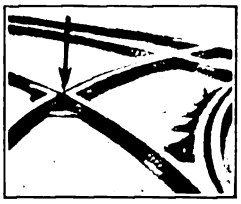
The thrusts of a wheel on a curve exert a tremendous weight against the inner guard due to a centrifugal force that tends to throw the track out of gage. There is also a tendency for the wheel to ride the inner guard, especially if the guard is dry and gritty. If the flanges are worn and somewhat sharp, the throat of the outside flanges may ride the head of the outside rail and thus make the inner guard of little or no value. Should the flange of the inner wheel be slightly chipped on the back, and this defect meet the rail at a moment when the flanges of the outer rail were grinding against a rail head, a derailment would be certain to occur. This, however, would be impossible in case of a double guard, as the wheel would be thrown sufficiently around to prevent an accident.

A single guard is of little value when opposite an unprotected frog in the outer rail, as it will not prevent a wheel from riding the point of the frog or causing a derailment. This condition is clearly shown in the accompanying illustrations, Figs. 1 and 2, which indicate how the flanges may be intercepted by the point of the frog when no approach guard has been provided. In Fig. 3 is shown a frog protected by a small V-shaped guard that is placed at the entrance to the frog and either bolted or cast to it. The cost of installing this device and double-guarding the curves on an entire system would frequently be less than the damage resulting from one derailment.

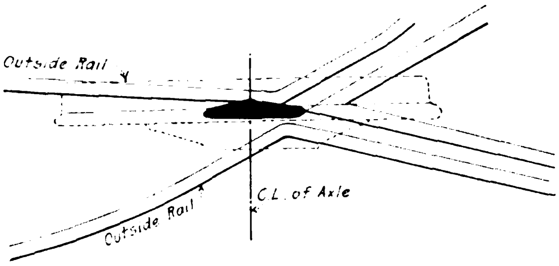
RESULTS OF THE STRAIN FROM NO OUTER GUARD

The strain on trucks due to improper guarding and gaging of rails on curves cannot be computed, but the disastrous results may be observed at the carhouses. Here are found wheel flanges worn to many sizes and shapes, trucks out of alignment, motor bearings unevenly worn, gears worn to various freak forms, and many broken parts, including corner gussets, diagonal tie rods and frequently axles.

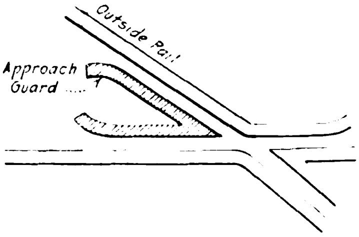
The use of the outside guard adds to the life of a wheel as it prevents the excessive wearing down of the flange. The accompanying illustrations compare the wear on wheels and flanges resulting from the use of both single and double guards. Fig. 4 shows the out-



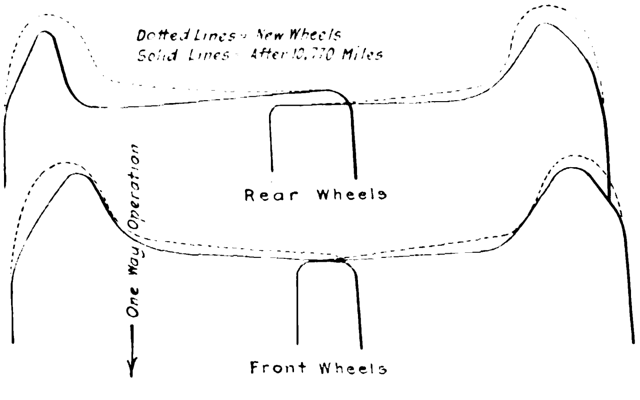
DOUBLE GUARD FOR RAILS — FIG. 1 — FROG UNPROTECTED BY APPROACH GUARD



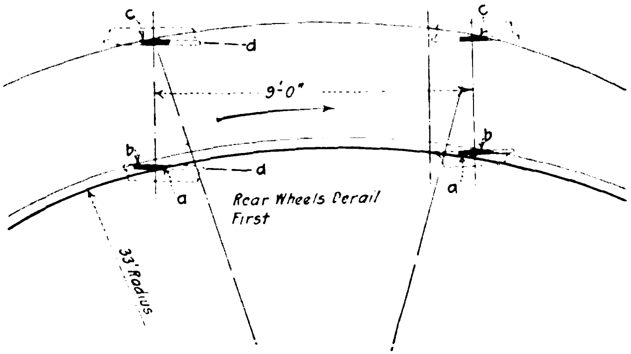
DOUBLE GUARD FOR RAILS—FIG. 2—POSITION OF WHEEL ENTERING FROG WITH NO APPROACH GUARD



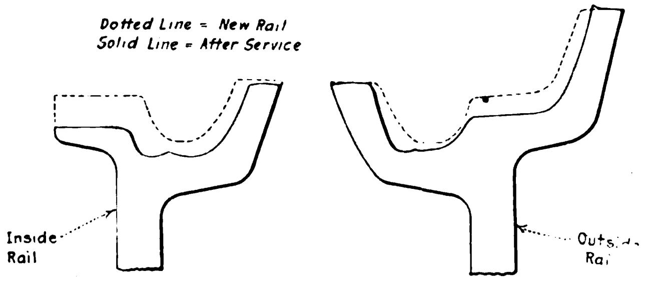
DOUBLE GUARD FOR RAILS—FIG. 3—FROG WITH APPROACH GUARD



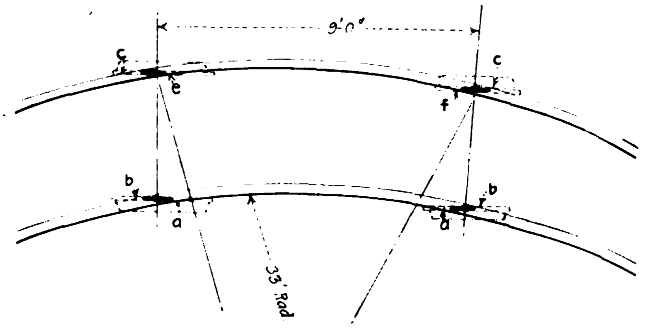
DOUBLE GUARD FOR RAILS—FIG. 4—WEAR FROM SINGLE-GUARDED CURVES



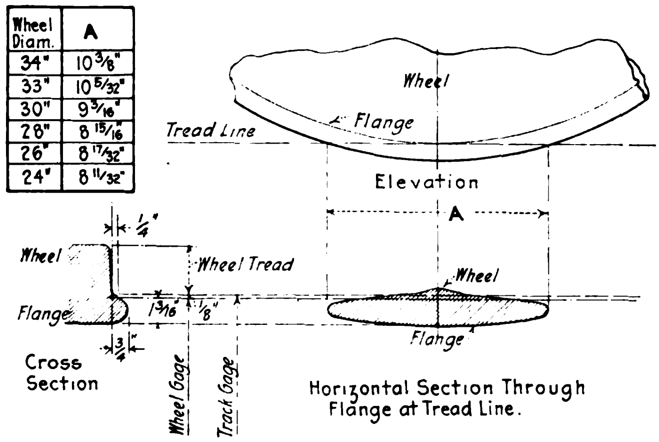
DOUBLE GUARD FOR RAILS—FIG. 5—POSITION OF SINGLE-TRUCK CAR ON SINGLE-GUARDED CURVE



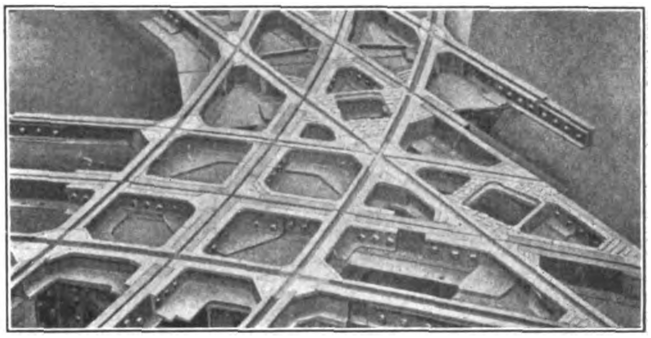
DOUBLE GUARD FOR RAILS—FIG. 6—WEAR FROM DOUBLE-GUARDED CURVES



DOUBLE GUARD FOR RAILS—FIG. 7—POSITION OF SINGLE-TRUCK CAR ON DOUBLE-GUARDED CURVE



DOUBLE GUARD FOR RAILS—FIG. 8—LENGTH OF FLANGE (A) IN GROOVE OF RAIL AT TREAD LINE



DOUBLE GUARD FOR RAILS—FIG. 9—CAREFUL GUARDING ASSURES ABSOLUTE ALIGNMENT OF TRUCKS

line of wheels before and after a run of 10,770 miles over single-guarded rails, or less than one-quarter of the guaranteed life. In Fig. 5, illustrating the position of a car on a single-guarded curve, is shown the wide groove between the single guard and the rail, the position of the axle as having no apparent relation to the radii of the curve, and the points of circular shear of the wheels against the rails. The points of contact of the flanges against the rail are indicated by the letters *A*, *B* and *C*. The dotted line *D* indicates the direction the wheels take when a derailment occurs.

OUTER GUARD LESSENS WEAR ON RAILS AND WHEELS

Figs. 6 and 7 illustrate the wear on rails and the position of the car axles when the double guard is used. The rails shown in Fig. 6 were removed from the Delaware Avenue and Market Street loop, Philadelphia, Pa., after three years of service when 16,000,000 wheels or 4,000,000 cars had passed around the curves. The tracks are located on a 10 per cent grade and the radius of the curve is 23 ft. ¾ in. to the inside rail. Fig. 7 shows the same wheelbase as Fig. 5, but on a double-guarded curve, where the guard rails engage the flanges as indicated by the letters *E* and *F*, and thereby tend to throw the wheels and axles to their natural position.

Wheel diameter in inches	34	33	30	28	26	24
A in inches....	10 3/8	10 5/32	9 3/16	8 15/16	8 17/32	8 11/32

The plan and cross-sections of the flange of the A. E. R. A. standard wheel are shown in Fig. 8. The cross-section to the left is developed on the tread line of the wheel, and the one above the plan shows the position of a wheel on a rail and indicates the length of flange (*A*) extending below the tread line. The horizontal section shows the flange and wheel cut at the tread line. In the table are shown the approximate lengths of this horizontal section, or the length of the flange extending into the groove of the rail for wheels ranging from 24 in. to 34 in. in diameter and having a ¾-in. x 1 3/16-in. flange, which is the prevailing size for city service.

Fig. 9 shows a layout where an absolute alignment of trucks on long sweeps and the use of the underground contact system necessitated a careful guarding of both rails.

RAILS SHOULD BE KEPT CLEAN AND WELL GREASED

Careful study and tests indicate that most of the wheel slipping on curves occurs with the inside wheel, and that all slipping takes place on the inside rail when the curves are carefully laid out and double guarded. Therefore care should be exercised to keep the curves clean and in no case should sand be used on the inside rail. It should also prove economical to keep both rails clean and the guards on short curves greased wherever local conditions will permit.

Noises caused by wheel grinding around curves can only be overcome by causing the flange to follow the rail in its natural tangential course, with the center line of the axle pointing near by along the radii of the curve. It is impossible for this to occur with a rigid truck on a single or double car, but with a flexible or radial axle truck this ideal condition must exist if both of the rails are properly double guarded.

In conclusion, the double guarding of rails is desirable not only for the reasons already given, but also as a preventive of corrugation. This corrugating may be overcome on both long and short sweeps of regular, irregular or spiral curves by installing inner and outer guard rails close to the main rails and even with the main rail-tread lines, provided the rails are carefully gaged. This method, the writer feels, is a solution of the rail corrugation question as applicable to curves.

An Inexpensive Way of Cutting Construction Costs

The Author Shows How Co-operation Among Departments Tends to Eliminate Waste—He Gives a Practical Plan by the Employment of Which Such Co-operation Can Be Assured

BY FRANK B. WALKER

Assistant Engineer Maintenance of Way Department Bay State Street Railway, Boston, Mass.

THERE has been so much written and said regarding efficiency and cutting costs in connection with the carrying out of maintenance and construction work that the writer has not the courage to try to bring out anything new on this subject. What he has to offer at this time is not entirely new on some of the progressive and economically managed steam railroads, although probably not so well known on the electric railways.

The plan, briefly stated, is (1) to have full and complete details of work to be done written up in an "authority for expenditure" or "work order"; (2) to distribute enough copies of the "authority for expenditure" thoroughly to inform all concerned; (3) to have frequent checking of costs during progress of work; (4) to have frequent complete reports of status of progress; (5) to write up statements of charges of the work when completed; (6) to analyze the actual cost of every important or unusual job; (7) to compare with the estimated cost the actual cost of every job, explaining increases or decreases in cost; and (8) last but not least, to have everyone, from president to office boy, vitally interested in total, comparative and unit costs, so that everyone who has anything to do with the work of construction or maintenance will be fully posted as to all phases of the work. The whole staff should literally eat costs, drink costs, sleep costs and even go so far as to dream costs.

A Simple Form of "Work Order"

The "authority for expenditure" or "work order" (referred to hereafter by the initials "A.f.E.") should preferably be typewritten in the office of the chief engineer or engineer of maintenance of way, on very thin bond paper blanks, standard letter size, so that nine legible copies can be made. The ordinary form might read about as follows:

NORTH & SOUTH STREET RAILWAY COMPANY

Easton, March 11, 1917.

A. f. E. No........ City....... Div....... For $.......

The President:

Authority for expenditure is requested to reconstruct 10,000 linear feet double track on Washington Avenue from Jones Street to Myers Street in the following manner. Remove 92-lb. 9-in. girder rail and cobblestone pavement and replace with 132-lb. 9-in. girder rail on chestnut ties and broken stone ballast, granite block pavement, grouted joints, as per detailed estimate and blueprint attached.

Reason

To replace worn-out rail and to comply with Order No. 27 of Public Service Commission.

Note—On 1917 Budget.

Approved by

........Chief Engineer ....Gen'l Mgr. ....Pres.

A complete detailed estimate and blueprints of proposed work are attached and made a part of the "A.f.E." It is desirable to separate the estimate into general headings of "material" and "labor" for each class of work, such as track, bridges, buildings, etc., and further it is found desirable to show the exact quantities of each class of material needed and the labor in considerable detail. This may seem unnecessary as the general officers do not care to know the number of spikes or track bolts, but others ought to know these details and it later saves making up a bill of material when requisitions are prepared and also helps the auditor and assistant engineer in checking the cost when the work is completed. The writer is a firm believer in the making up of complete detailed estimates as an aid to cost cutting and to avoid errors and duplication of office work. It is a fact that the reputations of many engineers have suffered from their neglect or lack of ability to prepare close and accurate estimates of cost. With reliable estimates to work from contracts may be let at more satisfactory prices and company work can be more satisfactorily arranged. The making of estimates requires science, art and prophecy—science to grasp the engineering features, art to apply constructive imagination sufficient to see the work as it will be carried out, and the vision of a prophet.

When the late James J. Hill was president of the Great Northern Railway, with which the writer spent fifteen years, the engineering department prepared its estimates so carefully that the total of the estimated costs of construction and reconstruction as compared with actual costs differed less than 2 per cent per year. On that road an effort was made to keep estimates slightly below actual costs. This served to keep everyone "on the jump" in an effort to lower costs to the minimum. The Great Northern's operating ratio was remarkably low, with correspondingly low construction costs.

The Operation of the "A.f.E." System

The blueprints, attached to each copy of the "A.f.E." should show the location and extent of the work and should give only enough details to show in outline what is to be done and the location of the work. The usual method is to show this in colors on right-of-way, property or mileage maps. This coloring can ordinarily be done by the office boy after one copy is made by a draftsman.

On the approval of an "A.f.E." one copy is retained by the president or the manager, whose office assigns the number and sends copies as follows: Three to the chief engineer, who files one, and sends one each to the roadmaster and the assistant engineer; one to the general superintendent; one to the division superintendent; one to the comptroller, and two to the auditor, who files one and sends one to the outside auditor. This accounts for the nine copies.

The chief engineer's office (or the assistant engineer's, depending on the office organization) makes requisition for material direct from the "A.f.E.," sending copies to the storeroom, purchasing agent, assistant engineer and roadmaster, and also writes a letter of instruction, sending copies to the auditor, general superintendent and division superintendent, assistant engineer and roadmaster. This letter describes how and when the work is to be done, what equipment is assigned to the work, the importance of hurrying, if any, what work will be done by company forces and what contracted for, how the operating department will handle traffic, etc. The general superintendent and division superintendent may then learn what is expected of their departments, can make all arrangements well ahead of the time of starting, and are given an opportunity to suggest changes if the engineering department's plans do not fit in well with operating or traffic requirements. The auditor has an opportunity to size up the work and to get out a letter of instructions as to any special accounts. Sometimes the auditor requires the estimate attached to the "A.f.E." to be divided as to maintenance and additions and betterments, so that he can place on his books approximate maintenance, and additions and betterment charges and avoid making large transfers of charges in his books when the work is finished and all charges are in. The roadmaster has a similar opportunity to perfect all of his arrangements and see that they agree with all conditions imposed.

"A.F.E." WORKS FOR EFFICIENCY

When the material is on hand and the work is organized and started, the word "cost" should be ever in the minds of the men in direct charge. The writer does not mean that the safety of the public or employees or the quality of the work is to be neglected, but rather that engineers, roadmasters and foremen should be made to realize that their reputations and the reputation of the engineering department depend just as much on keeping down the costs as on the quality of the work.

Immediately upon approval of the "A.f.E." it should be entered upon the next regular status report. The writer has found that status reports are desirable each ten days during the working season, dropping to thirty-day intervals during the winter. On the status reports the following information is suggested, varying with the kind of work, the reports to be abbreviated as much as possible: "A.f.E." number, date approved, date started, town or city, location, brief description of work, requisition numbers, note as to progress of delivery, progress of work, percentage completed, and any other data relative to the delays, causes, etc., and, finally, the date of completion.

Sample

A.f.E. 2792—10,000′ Do. Tr. Wash. Ave., Easton. Approved 5/11/16—Matl. ordered Reqns. 1016, 1092, 1217—None rec'd—Work started 6/1/16—av. 30 men—Grading 90% done—Work will be com. 20 days after mat'l is rec'd.

A.f.E. 2793—Commercial Dock—C St., Weston—App'd 5/13/16—Piling contract let to Jones Co.—Superstructure let to Smith Co.—Delayed waiting delivery of piles—All Company mat'l ordered—Reqns. 1130, 1131, 1132—None rec'd.

A.f.E. 2794—Moving partition Gen'l Office—Work com. 6/1/16.

These status reports, if made carefully by one familiar with the work, serve as a running history of each job. They should be sent to the manager, general superintendent, division superintendent, chief engineer, auditor and roadmaster. The head of each department knows that any delays or other causes of increased cost due to himself or any of his men appear in these reports, and the writer knows from his experience that they act as a wonderful tonic in causing the storekeeper and the purchasing agent to hurry delayed material, the superintendent of motive power to speed up delayed work equipment, the general superintendent and division superintendent to give the engineer or roadmaster every assistance in their power, and the engineering department to keep things moving.

STATEMENT AT COMPLETION OF WORK

After the work is completed and all charges are in, the auditor should prepare and send a detailed "statement of charges" to the chief engineer. This statement should be carefully studied for errors in charging labor and material, and a close analysis should be made of a comparison with the cost as estimated in the "A.f.E." Full explanations should cover the increases and decreases in cost of all essential items. The roadmaster should be advised as to these results and complimented when excellent results are obtained, and vice versa. In fact, everyone who is responsible for results in any degree should be made to realize during the progress of the work that the cost figures would at some time be held against him. These cost analyses and comparisons are of the greatest value in the office, especially to the chief engineer, office engineer and estimate clerk, or whoever prepared the original estimate.

All this may sound long and laborious, but the writer has handled from one to a dozen of these "A.f.E.'s" a day as a part of his regular duties in charge of work, and instead of finding it a burden he always considered the scheme a wonderful help, and there is no doubt but that it was a great aid in pushing work along smoothly and cheaply.

THE MISUSE OF MAINTENANCE AND BETTERMENT ACCOUNTS

In order to make partial checks on the cost of the work during its progress, the roadmaster's office should prepare and forward statements, at convenient but frequent intervals, of the total labor expended to date on each job. The roadmaster's office, and especially the timekeeper or time clerk, should have concise and definite instructions on how to make charges among the various Interstate Commerce Commissions' accounting classifications. The writer has found great variation between different roads and also between time clerks of the same road as to the dividing lines between grading, road and track labor, ballast, etc., so that several I.C.C. accounts on one division were not comparable with those on another division for exactly similar work. This resulted in making cost analysis impossible and frequently in raising maintenance charges and lowering betterment charges. It also sometimes happens that maintenance charges on other parts of the line are accidentally or deliberately placed in the accounts as betterments. This is, of course, wrong, and under the I.C.C. laws is likely to cause trouble. Close analysis of costs after work is completed easily brings these to light, and quite often many other strange and startling things.

USE OF OLD MATERIAL CUTS COSTS

In the preparing of estimates it is advisable to have a loose-leaf price list at hand. This is ordinarily furnished by the storekeeper or purchasing agent and should show prices at which all storeroom material is to be charged until the sheet is superseded by a revised one. The storekeeper or purchasing agent should give prices for rail, fastenings, switch material, bonds, ties, lumber, etc., so that the estimator may know that the same prices will be charged on the books for the material actually used. The estimator should also have a list of material on hand at all the stores—usually the storekeeper's monthly or quarterly inventory of material on hand will do—and should know the amounts and location of second-hand material on hand. In fact, he should be kept posted as to the whole new and second-hand material situation on the entire system so as to be ready to use anything available. It frequently happens that the hauling of new material from store or from another division yard to a job could have been avoided by using second-hand material or usable scrap already on hand. Of course, this all involves the office labor of keeping such lists up to date, but with the present price of material a little office work is a cheap way of making a big saving.

THE SCOPE OF THE "A.F.E."

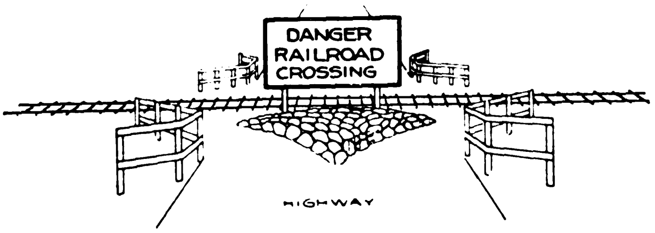
The writer believes that the more important jobs involving maintenance only can be more easily handled by "A.f.E.'s." However, the ordinary run of track, bridge or building maintenance should not be handled by "A.f.E.'s," but if a pile bridge is to be replaced in kind or a long section of track relaid and ballasted with equal rail weight and similar kind of ballast the whole account can be more easily handled all the way through by the system outlined.

The filing of all correspondence, requisitions, etc., with the "A.f.E.'s" is found to be a simple way of handling the files. Keeping of the "A.f.E." index and proper cross-references naturally becomes necessary.

Solving the Grade Crossing Problem

California Commission Considers the Reduction of Vehicle Speeds with Highway Obstructions and Other Methods

THE California Railroad Commission has been conducting an investigation with a view to decreasing grade crossing accidents in that State. Inspections of more than 2000 crossings have been made, 1600 of which inspections have been covered by reports sent to the interested parties. In these reports a total of 1100 recommendations have been made varying in importance from the removal of brush to the elimination of the crossing by closing the street or the separation of grades. The railroads and property owners have cooperated by removing obstructions to view in the vicinity of crossings, and in some cases this work has been done in advance of the commission's surveys.



SUGGESTED PLAN TO COMPEL CAUTION AT GRADE CROSSINGS

Among crossing protective devices the automatic flagman is regarded by the commission to be the most efficient. Sixty-six of these have been recommended to replace the ordinary crossing signs and bells. The publicity given to this general subject has brought forth many suggestions as to devices more effective than those now available. It is considered best to locate such devices in the middle of the highway whenever possible. With the aid of one of the railroads an automatic flagman has been located in the center of a city street, the first installation of its kind in the United States so far as known. If automobile traffic alone were to be considered, this location would be proper without question, but the lights used on horse-drawn vehicles are not adequate to indicate the presence of these devices, so power must be available to light them.

At the general hearings held by the commission last March, a method of protecting grade crossings by compelling low speed on account of physical obstructions placed in the way of vehicles was much discussed. Several different plans of this sort were suggested, six of which somewhat revised were sent to the railroads, the larger cities and some counties with a request for criticism, and with the suggestion that an experimental installation be made when any of the plans could be followed to advantage. One of these plans suggested a change in the profile of the road; three specified parkways, either in the center of the crossing or on each side, to divert the course of the vehicles, and one embodied an offset in the center line of the road which would require a vehicle to make two turns through 90 deg. before reaching the track. The accompanying illustration shows an obstruction proposed for each side of the track with a large danger sign to be 7 ft. above the ground.

The design which was submitted by City Engineer O'Shaughnessy of San Francisco was considered to be probably the best. In this plan the profile of the road is slightly broken about 400 ft. from the crossing; 25 ft. from this break an approach warning sign is located on the right side of the road looking toward the track; about 50 ft. from the crossing a flagman device and crossing sign are placed in the center of the road, and the road is widened to provide for the guard fence which surrounds them. Immediately beyond this fence is an accentuated break in the road profile.

Grade crossing accident reports and investigations bear out the belief that most of the accidents are caused by carelessness. The only way to eliminate accidents of this class, in the opinion of the commission, is to eliminate the crossing. Any expedient but grade separation is more or less temporary.

Home-Made Traffic Sign at Worcester, Mass.

HOME-MADE ILLUMINATED TRAFFIC SIGN

A convenient illuminated sign for controlling traffic at intersecting streets has recently been developed at Worcester, Mass., by George H. Hill, chief of police. As shown in the accompanying photograph, the sign consists of a square transparency mounted about 13 ft. above the street level and carried on a pipe stand which can be turned according to the direction in which traffic is permitted. The transparency is provided with red and green windows for the "stop" and "go" indications, and is illuminated by five 23-watt railway type tungsten incandescent lamps with frosted tips, the lamps being supplied with current from the trolley wire above. The connection is made through a porcelain fuse block mounted on a thin wooden spreader, and a snap switch within reach of the traffic officer. There is a secondary "stop" and "go" sign on the same pipe stand and about 6 ft. above the street level, where it can easily be read by pedestrians. The lettering on this sign is vertical.

Commissions Know Costs Are High

Canvass by Banking House Shows That Commissions Appreciate Present Operating Conditions—Regulatory Bodies Rather Anticipate Formal Application for Relief

As an investment banking house dealing exclusively in the securities of utility corporations, the firm of John Nickerson, Jr., New York, Boston and St. Louis, has been questioned by investors as to just what the attitude of public service commissions is going to be with reference to increases in rates to meet higher operating costs. In order to get this information at first hand, the company recently sent a letter to the presiding officer of every commission in the United States, asking whether the matter of increased rates had been brought before his regulatory body, and what its attitude had been or was likely to be.

Replies have been received from practically all the commissions. From a summary of these prepared by the bankers, it appears that while not many cases involving the question of the need of increased revenues have been presented, yet the commissions recognize the abnormal situation which exists in regard to the increased costs of material and labor. In many cases they indicate that these new conditions will receive consideration in the event of application being made for authority to increase rates.

SOME REPLIES ARE NON-COMMITTAL

In a number of instances the blunt statement is made that no cases involving the question have been before the commission. Some commissions, however, while stating that there has not been a case before them in which rate increases were sought to offset higher costs, go a step farther and point out that they do not feel that they can or should commit themselves in advance as to future action.

In some states the act creating the commission does not give it jurisdiction over rates, except upon complaint. In these states the matter of increasing the rates is rather "up to the company," and in one of the letters the commission makes the point that thus far it has issued no orders lowering company-made rates.

A few of the commissioners in their replies point out that operating costs enter into the determination of rates and are a matter of vital importance in such a consideration. One commissioner writes as follows:

"We are continually dealing with the matter of valuation of public service corporations and the fixing of rates. Necessarily operating costs, as they exist, are a vital consideration. We have had no application from public service corporations to increase rates due to alleged increased cost of operation, and I am not able to say what the attitude of the commission would be in that connection."

NUMBER OF COMMISSIONS AWARE OF ABNORMAL CONDITIONS

A number of the commissioners, while stating that no formal application had been made for increased rates, point out that the commmissions are aware of the existence of abnormal conditions and rather strongly imply that these matters will receive serious consideration when the question is brought formally to their attention. One commissioner says:

"While I appreciate the considerations which have prompted your inquiry, I am not able at this moment to give you a categorical answer. Mindful of existing conditions, we are anticipating that the general question probably will be brought formally to our attention, but no application of the sort, thus far, has actually been presented to us otherwise than in occasional isolated cases which have not been based upon anything outside of the ordinary. Each particular case would, of course, be decided upon its individual merit. Even if it should be established that increased cost of operation is universal, it nevertheless might occur, in individual cases, that economy in operation and postponement of all such extensions and betterments as would not involve any question of safety in operation or impair measurably efficient service, properly might be relied on to offset, to some extent at least, the increased burden under consideration."

Another commissioner puts it this way:

"I think, upon reflection, you will see that you have asked a question which cannot properly be answered, save with respect to specific cases as they arise. At the same time you may be assured that the members of this board are fully alive to the present abnormal conditions and the increasing cost of oil and coal, as well as other expenses with which the managers of the public service corporations are confronted."

In another instance reference is made, without citing specific cases, to the fact that the matter has received consideration in recent cases, and the following statement is made:

"We beg to advise that the commission did not forget, when making decisions in rate cases, that there has been a very material advance in the expense of performing service. We endeavor, as best we can and with as little friction as possible, to cause the claimant or petitioner, as the case may be, asking for a reduction in the rate, to understand these conditions. We think it must be a matter of general knowledge."

ONE COMMISSION WILL ACT FEARLESSLY, SQUARELY AND EXPEDITIOUSLY

A letter from a member of another commission indicates that the subject has been informally discussed by the commission with a view, apparently, of formulating a policy to be pursued in connection with rate-increase applications when presented. It states:

"This matter has been talked over with my associates and the conclusion is that this commission is going to do its duty fearlessly. It is not in the habit of giving out in advance what any of its decisions are going to be, but you can rest assured that whenever matters of this nature are presented to us, they will be dealt with squarely and expeditiously."

CASES DECIDED SHOW CONSIDERATION OF UTILITY NEED

There have been a few cases before the commissions, the bankers say, and in these a strong inclination has been shown to give the question careful consideration. In some instances increases in rates have been allowed. The chairman of a very prominent Western commission writes:

"In response to your question regarding the need for increased rates, I would say that this matter is now before the commission in one or two cases. Without indicating what the commission's decision will be in those cases, I would simply say that this commission will do whatever any fair-minded man would do on the testimony in these cases."

In a letter written by one of the commissioners of one of the oldest and probably ablest commissions in the United States, it is stated that the question of increasing rates to meet the increased costs has been before that regulating body. This commissioner says:

"Before any increase in rates is approved by this commission, the cost of the service, the physical value of the property and all other items usually used to determine what a reasonable and just rate should be, always receive careful consideration. We have approved many increases on showings made that the cost of the service had increased due to increased cost of material and labor, and while I would not care to speak for any future action of the commission, I take it that any action which does not consider the increased cost of material and labor will not be taken by this commission."

GENERAL INCREASE IN RATES ANTICIPATED

This same commissioner points out that it must always be determined whether the increased costs are temporary or reasonably permanent. He mentions the fact that in some instances this condition was written into the order authorizing the increase, *i.e.*, that when costs returned to normal an application for a reduction of the rate would be in order. He then sums up the whole situation in this way:

"I see no good reason why there should not be, and I anticipate that there will be, a general increase in rates for all service furnished by public utilities due to the increased cost, unless all signs fail and prices of labor and material drop to the scale obtaining several years ago."

FAVORABLE DECISION OF WISCONSIN COMMISSION

The Wisconsin Railroad Commission had before it, in the application of the Village of Cambria, as a gas utility, for authority to increase rates, the question of allowing an increase due to the increased cost of gasoline. In disposing of this case on Jan. 24, 1917, the commission said:

"From the information which we have at hand, it would seem that the cost of commercial service is rather high. An upward revision in the rates will not be inequitable, however, when we consider that at the present and even at the proposed price of gas to private consumers, either a considerable part of the actual cost of the gas must be charged against the street lighting, or the deficit must be borne by the general taxpayer, which amounts to the same thing, since the village receives no other benefit from the plant. Taking all the facts into consideration, it seems to us that the utility is entitled to an increase in its rates in order to enable it to give the proper service without unduly burdening the general taxpayer."

Here was an instance where the commission recognized the fact that the burden of the increased cost of operation should not be borne entirely by a few for the benefit of all consumers.

NEW YORK COMMISSION REALIZES COSTS ARE HIGH

Referring to high operating costs, an opinion of a member of the Public Service Commission for the First District of New York in a recent lighting rate case is cited as follows:

"In view of the unsettled economic conditions arising out of the state of war, the increases in the cost of production and distribution which have taken place within the last two years, and which are likely to continue, together with the wider recognition of labor and greater remuneration and improved working conditions enhancing costs to the company, the effect of a reduction in the rates upon the company's operations must be problematical. Certainly at this juncture the commission would not be justified in making a drastic order which would disturb the company's stability."

In a still more recent case, decided on April 26, 1917, this same commissioner says:

"Nor will the normal increase of business combined with the increase in consumption which usually follows a reduction in rate justify a finding that the effective rates are excessive. The operating figures for 1915 do not take into account the increases in the cost of labor and materials which have taken place during 1916 and 1917, which may be augmented as a result of the national exigencies arising out of the war with Germany. While it would be unjust to permit a utility to exact demonstrably excessive rates from consumers in order to transfer the burden of the taxation which must be borne as the material sacrifice in support of the contest by arms, yet in times of unsettled conditions the margin of safety necessary for the stability of public utilities should not be curtailed."

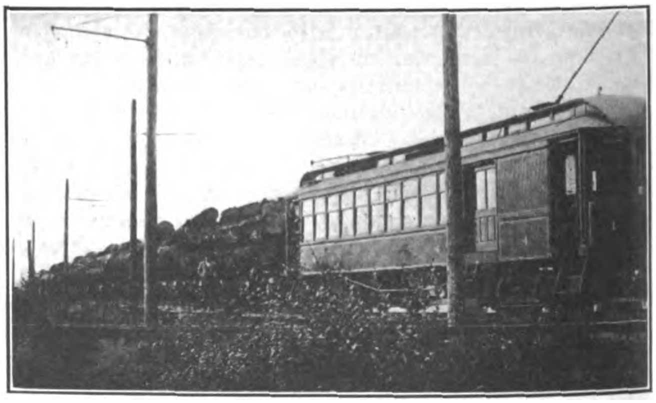
CONCLUSION REACHED BY BANKERS

This summary of the replies, it is stated by the bankers, is indicative of the fair-minded tone which characterizes them. In the bankers' opinion, the following facts seem to stand out very prominently:

1. The question of securing increased revenues to cover higher operating expense has not been generally presented to the commissions.
2. A large number of the commissions have given the matter some informal consideration and rather anticipate that the matter will be brought very shortly to their attention in a formal way.
3. In most cases in which the question has been presented, a spirit of appreciation of the conditions confronting the public utilities has been shown, and a desire indicated to maintain the stability of margin of safety of public utility securities.

An Improvised Electric Locomotive

The Northwestern Lumber Company at Hoquiam, Wash., is completing the logging of a tract of land practically within the city limits. To facilitate getting the logs to the mill the company built an electric railway line into timber, and the logs are being hauled out by an electric car owned and operated by the Gray's Harbor Railway & Light Company. This is the standard car of the company except that the motor capacity has been increased from 160 to 240 hp. The logging company's private electric line connects with the Gray's Harbor



ELECTRIC LOGGING TRAIN, HOQUIAM, WASH.

interurban at Electric Park, and the logging trains coming out over the private lines of the park continue over the main lines to the Hoquiam River, where a spur and log dump is built opposite the Northwestern mill. P. A. Bertrand, general manager of the railway company, states that from six to seven loads of logs per train are easily handled, and that during the last four years approximately 8311 carloads, totaling 61,197,000 ft., have been handled.

Electric Railways Must Have Greater Revenue

The Author Considers an Advance of 20 Per Cent in Fare to Be Moderate as Compared with Increased Costs in Other Lines

BY JOSEPH K. CHOATE
Vice-President J. G. White Management Corporation, New York City

THE question of operating costs has become a very serious one with everybody, and particularly with those interested in traction service. The tremendous increases that have arisen in the cost of labor and material, ranging from 40 to 125 per cent, have had to be faced with rates of fare which were originally based upon the nickel. The nickel was adopted years ago as the unit of fare on all city traction lines at a time when 5 cents bought more than can be bought for 10 cents to-day. Only the advances in the art and efficiency of administration have enabled the traction lines to exist and to continue their work, even before the present conditions brought about by the war came into existence. The increases in the cost of labor and material have been steadily met for a great many years previous to this time.

WHY ELECTRIC RAILWAYS NEED RELIEF

In addition to the greatly increased cost of labor, there has been also the competition with which our companies have been faced, particularly from the automobile. The United States census returns, made public soon after the first of January this year, showed that there were 2,500,000 automobiles in the country. With an average seating capacity of five to an automobile these have a total seating capacity of six times that of all the traction lines in the country, and two and one-half times more than all the railway lines combined, steam, electric and otherwise.

During the year 1916 the railways of the United States paid $152,000,000 in taxes. A large part of this amount has been devoted to the improvement of highways, generally along the lines of traction companies, and thus has added to the competition and to the burden that the traction lines have had to bear. In addition to this, due to old and obsolete laws, a species of graft has existed in cities and municipalities in the matter of paving. The requirement regarding paving first existed within the city limits, but has been extended to the state highways. This requirement has been met, but not only has it imposed a great burden upon the railways in the matter of costs, but it has produced a system of legal graft.

When horse cars were in use the pavements of cities were destroyed by the action of the horses traveling over the pavement always in the same place. To-day, however, a double-track electric line occupies but 10 in. of the street width, and a single-track line but 5 in., that is, merely the width of the rails. There is no wear upon the pavement whatsoever. On the other hand, the railway company, by keeping the tracks clear of snow and encumbrances of all kinds, invites traffic of every description—automobiles, trucks, etc.—to its lines. All of these things should be taken into consideration in connection with our claim for additional remuneration for the service which we render.

We are also met at this time by the possible future requirements of the traction lines in connection with their operation for the benefit of the government. While at present this may not be of any great moment it may, before this war is finished, be of the very greatest importance in the part the traction service may be called upon to perform in connection with government requirements. I am positive that the government of the United States will find no more loyal or patriotic men than those who are interested in the ownership or operation of the traction lines.

HOW SHALL WE OBTAIN THE DESIRED RELIEF?

The question which now arises is how best to appeal for an increase in the charges for our service, in the return we should receive for it. The argument has been made that the distance tariff offers the best means of doing it. Without a doubt a distance tariff, as applied in European cities, should have been applied in this country. This would have provided a much fairer way of paying for the service which we now give, but at present it would be unwise to ask the commissions to permit us to put a distance tariff into effect. Most of our traction lines, including interurban lines, have made it a prominent part of their policy and progress to extend their lines into outlying districts which offered attractive living conditions for people of moderate means, through low rentals and prices for necessities. If now a distance tariff were to be applied, the burden would be placed on the very people who have been attracted into these outlying districts by the traction lines.

The situation that will arise in presenting this matter through the efforts of the traction lines to the commissions will be met, possibly, by the desire of the commissions to go into the question of valuation. It is to be hoped that the commissions will not require at this time the making of detailed valuations, as it would require so much time to complete them that all hope of relief of the present situation would be deferred for years. However, some form of approximate valuation can be arrived at, if it is deemed essential that valuations should be made.

We start, in the first place, on the premise that for years 5 cents has been the general rate of fare throughout the United States. In a few places special laws have required 3-cent fares, which impose an additional charge for transfer privileges and other features of service which are generally given by traction lines. In these cases, therefore, the rate per capita to railways operating on the 3-cent basis has been as great as with the 5-cent rate in cities where transfers and other privileges are given gratis. The time has now arrived, in my opinion, when there should be an increase in our rates of fare commensurate with the increases that have occurred in the cost of every commodity that forms part of the necessities of life. These run anywhere from 40 per cent to 200 per cent, while we have had no increase. This, I think, is the justification for any application that we may make at this time. An increase in fare from 5 to 6 cents will mean increase in revenue of approximately 20 per cent, a moderate advance in view of the very great increases enumerated, and of the increase in prices which we have to pay for every commodity that enters into the cost of our service.

It should also be borne in mind that the increase of 20 per cent to the railway company is, in terms of the patron's income, a very small percentage. Let us take, for example, the lowest paid wage earner, the laborer, who earns, say, $2 a day. In the 300 working days of the year he earns $600. If he travels on the cars to and from his work the increase in his expenses is 2 cents a day, or $6 a year., That is 1 per cent of his income required for the added cost of transportation. This percentage is less as the income of the individual is greater than the amount cited.

Franchise Limitations Are Not Insuperable

There is also another question which will arise in going before the commissions, namely, that of franchise conditions. In the inception of many of our lines the promoters were willing to accept franchises which limited the rate of fare to 5 cents, particularly within the city limits. Now my own opinion is that most communities recognize that one of the greatest factors in the prosperity of any city or village are prosperous, well-operated traction lines. I believe, therefore, that if this point is forcibly presented, municipalities, as a rule, will not be very strong in their opposition to an increase above the franchise rates.

There have been decisions in the State of New York, and I think in some other states as well, in which the courts indicated that utility commissions have a right, under certain conditions, to allow greater than franchise rates. I feel sure, therefore, that if the proposition is presented fairly and squarely to the commissions themselves there will be no very serious obstacle to overcome in order to get some relief.

It is my feeling that the action of all the traction lines as a unit at this time is most desirable; not that they are in any sense to be combined in restraint of trade, but because the representation of the traction lines as a unit will eliminate the possibility of one community being subjected to an increase in rates when another is not. All communities will be made to feel that they have been treated fairly and uniformly.

Railways in New York State Asking for More Revenue

The electric railways of New York State have at work a special committee on ways and means for obtaining additional revenues, of which the writer is chairman. This committee is acting as a unit and has already held conferences with the two commissions in the State, as was noted in last week's issue of the Electric Railway Journal. I believe that by having this committee appear as a unit, representing all the traction lines of the State, it will have a very decided effect upon the commissions themselves and thus relieve them from having one community arrayed in criticism against another. While acting as a unit, this committee is composed of two divisions, one for Greater New York and the other representing the railways in the rest of the State. This is necessary because the conditions and requirements in the two cases are so different. For example, the railways of Greater New York are not now petitioning directly for an increase in their rate of fare, but rather are asking permission to make a charge for transfers, for the reason that the surface lines in that city have as a competitor the subways and elevated lines, in the ownership of which the city is a partner. The "up-State" lines, on the other hand, will probably find it advisable to petition for direct increases in rate of fare.

By working according to the program outlined above we are going to overcome the objections which may be brought forward, and the necessity for the commissions to make examinations of our books to see what returns have been made upon the money invested. Certainly the traction lines of this State do not return any great amount on the investment, and if one will investigate the prices of traction lines in general he will find that no one wishes to buy them under present conditions, as the returns therefrom are not at this time sufficient to meet the demands.

Higher Fares Must Come

United action on the part of the railways in this and other states is our salvation, and I feel that if we present our cases to the commissions in a fair and straightforward way they will seek ways and means to give us a helping hand in this direction. From conversations with members of the commissions of this and other states I am convinced that at heart they have the feeling that increased revenue must be provided to avoid disastrous results. I am also convinced that the action taken by the electric railways in New York State at this time will have a far-reaching influence in all sections of the United States.

What the California Association Has Done*

BY W. V. HILL, MANAGER

THE California Electric Railway Association, consisting of twenty-four electric railways and three steam line railways operating electric units, was organized on May 1, 1916, for the purposes of conducting co-operative work for the welfare of its members, promoting good relations with the public, and the advocating of intelligent legislation, both State and municipal, affecting the interests of the electric railways in California.

While the association has been instrumental in bringing together the various officials of the electric railways, thus enabling them to exchange views on important subjects of common interest to all, these meetings should have been more frequent. There should be a better understanding and closer co-operation among the members.

The association has conducted a very satisfactory publicity campaign in newspapers and periodicals throughout the State. There has been very little adverse criticism appearing in any of the publications recently. The association as an association cannot claim full credit for this changed sentiment, as the public utterances made by several of its members and the educational work carried on by the several member companies through the medium of their magazines have been largely responsible for this satisfactory state of affairs.

Legislation

The association did what it could in connection with the Adamson eight-hour bill and the Cullop bill in explaining to the California representatives in Congress the reasons why electric railways should not be included in the provisions of those bills, and while other electric railway associations as well as companies and individuals also may have protested, the activity of the California association had its effect. The association has also presented data in Washington upon the importance of proper compensation from the government to electric railways for transporting mail.

In State, county and municipal matters, the association has been of especial help in supplying information to authorities and others in regard to jitney competition. The association also obtained from the Supreme Court a decision that the Railroad Commission has a certain amount of jurisdiction over those jitneys which operate in interurban service on regular routes and schedules. Under this authority the association has petitioned the Railroad Commission to make an investigation of the jitney question in the State and also the franchise laws under which the electric lines operate. The commission has investigated the jitney problem but as yet has given little time to the franchise question.

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*Abstracted from first annual report prepared for meeting of association at San Francisco, May 7.

Statistics showing the type and cost of paving have also been gathered and sent to all the members. Considerable thought has been given to safety measures, grade crossings, etc., and opinions on the effect of jitney competition on the value and sale of securities have been obtained from a number of Eastern bond houses which handle the securities of the electric railway utilities in the State of California.

New York City Lines Ask Two-Cent Transfers

Formal Applications for Relief Were Filed with the Public Service Commission, First District, This Week by the New York Railways, the Brooklyn Rapid Transit Company and the New York & Queens County Railway

PART of the inevitable has come to pass. On May 23 formal applications for authority to charge 2 cents for first transfers were filed with the Public Service Commission for the First District of New York by all the street railways in New York City, with the exception of the Third Avenue Railway and the Second Avenue Railroad. The latter company, as well as the companies coming under the jurisdiction of the Second District Commission, is expected to follow suit in a few days. As this issue was going to press, application for relief was made by the Third Avenue Railway.

The applications submitted for the New York Railways, the Brooklyn Rapid Transit Company and the New York & Queens County Railway all stated the imperative need of increased revenues in order to enable the companies to meet the high costs of operation and pay a fair return upon the investment. They were turned over to commission counsel, who will outline a method for further procedure by the commission.

B. R. T. Asks Modification of Transfer Order

The formal application presented by the Brooklyn Rapid Transit Company for its allied surface lines asked for a modification of the March 17, 1914, transfer order of the commission. While the company proposes to maintain the basic principle of 5 cents for a continuous ride between residence and business sections, it desires to curtail the excessive use of transfers by charging a small amount on them except in the case of certain feeder lines.

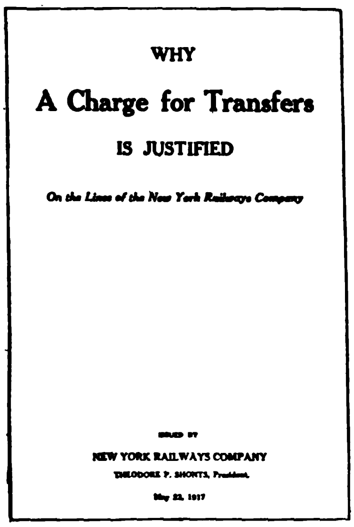
A statement accompanying the applications says:

"Under the commission's 1914 order transfer passengers are increasing 8,000,000 a year, and cash passengers are barely increasing at all. During the three fiscal years preceding July 1, 1914, the average annual increase in passenger revenue was $634,796. During the three years following, the average annual increase has been only $119,826, an average yearly decrease in growth of $514,970. The average fare received per passenger in 1913 was 3.82 cents, while in 1916 it was 3.28 cents.

"We realize that the new subway and elevated railroad facilities have diverted some traffic from the street railways, but any accountable diversion due to this cause does not explain the comparatively great loss in street railway revenue since the present transfer order went into effect. As cash passengers relatively diminish, the transfers which they use would be expected to diminish proportionately. That they have increased so enormously is proof conclusive that they have supplanted cash fares—either by more extended use of the privilege or by more fraudulent use of the transfer ticket.

Increased Costs for B. R. T.

"On the entire Brooklyn Rapid Transit system during the calendar year 1916, as compared with the preceding year (when costs were also high), transportation wages cost $659,000 more, power $243,000 more, maintenance $182,390 more and taxes $533,062 more. Of the important railway supplies the increase in prices in 1917 over 1915 has ranged from 26 per cent to 400 per cent. The price of the product—transportation—has actually been going down, measured by the unit of fare per passenger, while the cost to us of that product has been rising. Such a tendency is neither just nor wholesome.


WHY

A Charge for Transfers

IS JUSTIFIED

On the Lines of the New York Railways Company

ISSUED BY

NEW YORK RAILWAYS COMPANY

THEODORE P. SHONTS, President.

May 22, 1917

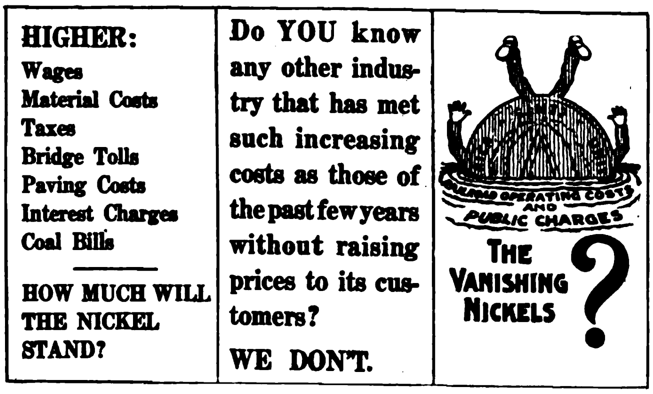
COVER OF NEW YORK RAILWAYS BOOKLET

8 Per Cent Is B. R. T. Minimum Rate of Return

"The courts seem generally to have agreed that a rate of return of less than 6 per cent on fair property values is confiscation when forced by official regulation or by legislative act. Measured by that rule of law the present transfer would be declared invalid, if contested. But there is a wide difference between a confiscatory rate and a reasonable rate of return. The former merely protects the investor in the title to his property. The latter protects the public in its reasonable demands for facilities and encourages the investor to supply them. The statutes of New York for sixty years forbade a reduction of rates which would bring the return upon capital expended to less than 10 per cent, and this is not unreasonable. The preponderance of opinion is in favor of a return of from 8 to 10 per cent.

Actual Rate of Return of B. R. T.

"The gross income for 1916 was less than 5 per cent on the gross assets, including all kinds of property owned. For comparison with what the commission has



HIGHER:
Wages
Material Costs
Taxes
Bridge Tolls
Paving Costs
Interest Charges
Coal Bills

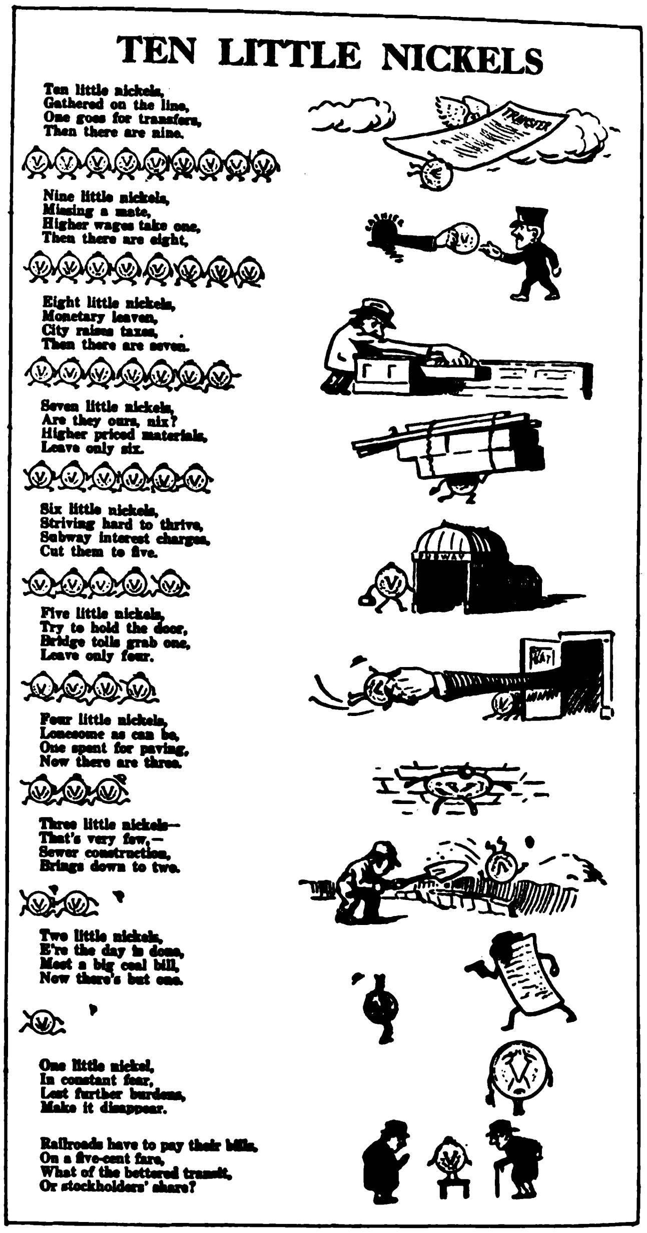
HOW MUCH WILL THE NICKEL STAND?

Do YOU know any other industry that has met such increasing costs as those of the past few years without raising prices to its customers?

WE DON'T.

RAILROAD OPERATING COSTS
AND
PUBLIC CHARGES
THE
VANISHING
NICKELS
?

OUTSIDE OF CAR PAMPHLET ISSUED BY THE BROOKLYN RAPID TRANSIT COMPANY



TEN LITTLE NICKELS

Ten little nickels,
Gathered on the line,
One goes for transfers,
Then there are nine.

Nine little nickels,
Missing a mate,
Higher wages take one,
Then there are eight,

Eight little nickels,
Monetary leaven,
City raises taxes,
Then there are seven.

Seven little nickels,
Are they ours, nix?
Higher priced materials,
Leave only six.

Six little nickels,
Striving hard to thrive,
Subway interest charges,
Cut them to five.

Five little nickels,
Try to hold the door,
Bridge tolls grab one,
Leave only four.

Four little nickels,
Lonesome as can be,
One spent for paving,
Now there are three.

Three little nickels—
That's very few,—
Sewer construction,
Brings down to two.

Two little nickels,
E're the day is done,
Meet a big coal bill,
Now there's but one.

One little nickel,
In constant fear,
Lest further burdens,
Make it disappear.

Railroads have to pay their bills,
On a five-cent fare,
What of the bettered transit,
Or stockholders' share?

INSIDE OF B. R. T. CAR PAMPHLET

itself approved as to the valuation of our properties, we take as a basis the appraisal of the commission's expert, Bion J. Arnold, in 1909, plus the net additions of property since that date (of which the commission has been fully advised). This result closely approximates our book value less accrued amortization, and the rate of return on the book value in 1916 was only 5.69 per cent. Mr. Arnold's figures covered only the assessed value of real estate and the then present value of tangible property, based upon the cost of reproduction less depreciation. They did not include allowance for easements, real estate values in excess of assessed valuation, interest during construction, franchise values, development expenses, working capital, or preliminary legal and organization expenses, etc.

"As the commission said in its opinion: 'All of these items would be absolutely essential disbursements in the reproduction of any existing railroad, and they would add considerably to the figures of valuation given in the foregoing estimate if proper allowance were made for them.' We have therefore added to the original estimate percentages of costs which Mr. Arnold and other experts have assumed to be fair allowances for omitted items, except franchise values, which we have not attempted to include. Upon this basis the total reproduction value as of January 1, 1909, was $76,990,105, to which have been since added properties valued at $2,718,095—making the total reproduction value as of March 31, 1917, $79,708,200. On this valuation the return for 1916 was only 5.91 per cent. The commission, therefore, has ample information as to the value of our properties, and the return is less than what the courts have held to be confiscatory.

"Out of the total passengers carried only about one-fourth will be affected by the proposed transfer charge. The estimated increase of revenue will not exceed $1,200,000 per year. That addition will still leave our net return less than what by the concurrent opinion of public utility commissions and experts is reasonable and proper."

PETITION OF NEW YORK RAILWAYS

The application made by the New York Railways requested either an abolition of free transfers or an authorization of a charge of 2 cents for each transfer, without extra charge for retransfers. In support of its application the company said that it had never paid a dividend on its capital, nor had its income in any calendar year been sufficient to pay the full 5 per cent interest on the adjustment income bonds. The actual return for the year ended Dec. 31, last, "or true net income from operation," was $2,431,416. This total was obtained, it was explained, by deducting from the gross earnings from all sources only operating expenses and taxes, and without deducting the rents paid for leases, interest on funded debt or other fixed charges.

For the five years ended Dec. 31, 1916, the average annual return was $3,766,814. If the return had been sufficient to permit payment of interest at the full rate of 5 per cent on the adjustment bonds, the income would have had to be $4,433,323. If it had been sufficient to pay also 6 per cent on the outstanding stock, it would have had to be $5,480,626.

The company said that for the nine months ended March 31, 1917, the net income was insufficient to pay any interest on its adjustment income bonds, and was also insufficient to pay the interest due and to become due upon the outstanding first real estate and refunding 4 per cent mortgage bonds. During the nine months this deficiency amounted to $464,271.

The total number of passengers carried by the system for the year ended Dec. 31, 1916, was 335,752,271. Of this number 15,184,304 were "revenue" transfer passengers, or those for whose transportation the company received some measure of compensation because of joint rate arrangements with other carriers, and 92,466,233 were full transfer passengers. During the four years ended Dec. 31 the average annual total number of passengers carried was 371,266,155. Of these 13,906,081 were revenue transfer passengers and 106,315,339 were free transfer passengers. The average fare received in the last calendar year was 3.53 cents, while for the last four-year period the average was 3.49 cents.

The application stated that the value of the property of the New York Railways devoted to public service is $109,206,000, and that on the basis of the commission's own determination in the Metropolitan Street Railway reorganization, with later additions and betterments, the value is at least $89,000,000. On the latter figure the average annual net income for the five years ended Dec. 31, 1916, is equivalent to a return of 4.23 per cent. The company said it should receive at least 7 per cent and an addition of 1 per cent for surplus and contingencies, and that on the commission's valuation the return should not be less than $7,120,000, or 8 per cent.

OTHER POINTS OF THE WEEK'S ACTIVITIES

The application of the New York & Queens County Railway asked for relief, but did not specify a charge for transfers. It was said that the net investment in road and equipment was $8,427,115. The total operating expenses for the year ended June 30, 1916, were $1,435,764, and there was a deficit for the year of $294,570. During the fiscal year 28,373,608 passengers were carried, and the total number of transfers collected was 8,964,862, making the average fare per passenger 3.80 cents, which is less than the cost of carrying such passenger. Since the opening of the new Astoria and Corona rapid transit lines the loss to the company has increased, the loss up to May 15 being $70,301. The company simply petitions the commission to act in such a manner as to permit it to operate without loss.

During the week the Brooklyn Rapid Transit Company issued a car pamphlet designed to show the public the various burdens upon the nickel fare. This pamphlet is reproduced on page. The New York Railways issued a nineteen-page booklet, as shown in the illustration on page 957, to show why a charge for transfers is justified. Placards were also placed in the cars, asking whether it was not more fair to charge 92,000,000 persons for transfers than 257,000,000 persons a higher unit fare.

A resolution protesting against favorable action by the Public Service Commission on any request for increased fares has been adopted by the Board of Aldermen at the proposal of President Dowling, who urged that "before any authority is given these street railway lines to increase fares or charge for transfers a thorough investigation of the bond and stock issues of not only the holding companies but of the various lines making up these several systems be made by the commission."

N. S. C. Slogan Pamphlet

The National Safety Council has recently issued a pamphlet containing safety slogans. Among those suggested for electric railways are as follows: Stop when you see an officer signaling. Better lose the car than be thrown under it. A trolley car can't guard you to keep out of its way. Take your life current from the trolley of safety. Wait till the car stops and face front when alighting. Main thoroughfares are not intended for playgrounds. Don't lose your head in traffic or you may lose a limb. Unless your head is solid bone, do not put it out of a car window. Wait until the car stops before you step on or off; the car can wait. Before leaving the car look both ways—for wagons, autos and motorcycles. When passing behind a car always look to see what is coming from the opposite direction.

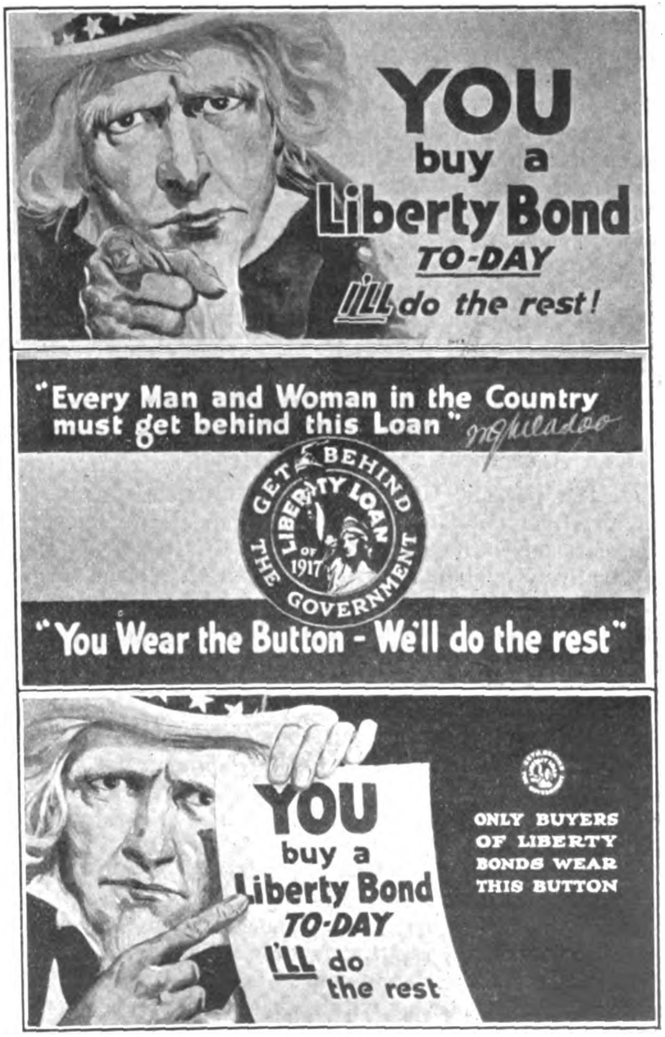
Floating the Liberty Loan

Plans for Selling War Bonds Occupy Attention of Electric Railways—Street Railway Advertising Operators Prepare National Campaign

DURING the past week the most prominent feature of war-time activities of the electric railways appears in their plans for aiding subscribers to the new government bond issue that constitutes the "Liberty Loan." In addition, the electric railway industry is playing an important part in the popular movement for giving wide publicity to the sale of war bonds.

Beginning early next week the merits of the new Liberty bonds will be advertised in some 50,000 electric cars, operating in all sections of the country. Free advertising space in the cars was recently offered to Secretary of the Treasury McAdoo by Barron G. Collier on behalf of the country's street car advertising operators. The cards to be used in this campaign, six in number, are being supplied by the Collier Company and were designed in its art department, in co-operation with Mr. Woolley, director of publicity for the Treasury Department at Washington. Three of the designs are illustrated herewith. As will be seen, they emphasize the patriotic as well as the investment feature of the loan, and liberal use has been made in the design of the button to be issued to purchasers of bonds.

The management of the San Francisco-Oakland Terminal Railways has taken a great interest in this movement, and placards are being displayed in all of the cars and ferry boats operated by this company to call


YOU
buy a
Liberty Bond
TO-DAY
I'LL do the rest!
"Every Man and Woman in the Country must get behind this Loan" WG McAdoo
GET BEHIND THE GOVERNMENT
LIBERTY LOAN OF 1917
"You Wear the Button - We'll do the rest"
YOU
buy a
Liberty Bond
TO-DAY
I'LL do the rest
ONLY BUYERS OF LIBERTY BONDS WEAR THIS BUTTON

ELECTRIC RAILWAYS IN WAR TIME—CARDS DISPLAYED BY ASSOCIATION OF STREET CAR ADVERTISING COMPANIES the attention of the public to the bonds. In the last issue of *Key System News* which is published by this company, it is urged upon all employees their duty is to subscribe to these bonds up to the amount of their ability to do so. Subscription blanks have been placed at all available places for employees and for the public generally, and the management is supervising the entry and delivery in proper form of subscriptions received in this manner.

A number of companies have arranged for sales of the bonds to their employees on installment plans. Among those which have done so is the Bay State Street Railway Company. The leaflet issued by the company descriptive of these bonds says that they will be cared for by the company if the subscriber desires, and the coupons will be collected when they are due, the amount of the coupons being paid to the employees owning the bonds. Attention is called also to the fact that the Amalgamated Association of Street & Electric Railway Employees of America urges its members if possible to subscribe, and there is reproduced a telegram from W. D. Mahon, president of the association, to this effect. The leaflet concludes: "It is an easy thing to cheer the flag, an easy thing to spout patriotic oratory. But the call for this vast amount of money brings to Americans of every class, as individuals, a demand for something that Americans find much harder—personal self-denial. It brings the first concrete opportunity to show whether your patriotic sympathy with the cause of the Allies and the declared purposes of the conflict with the Prussian aristocracy has been only conversation; whether, when the President summoned the American people to the sacrifices and suffering inseparable from war, he really represented you."

As a part of the movement toward the exploitation of the loan in New York State, where it is expected that nearly a billion dollars will be raised, the Interborough Rapid Transit Company has announced arrangements for the purchase of the bonds by its employees on weekly payments of $1, and that free advertising space in all of the company's cars has been offered to the government.

War Notes

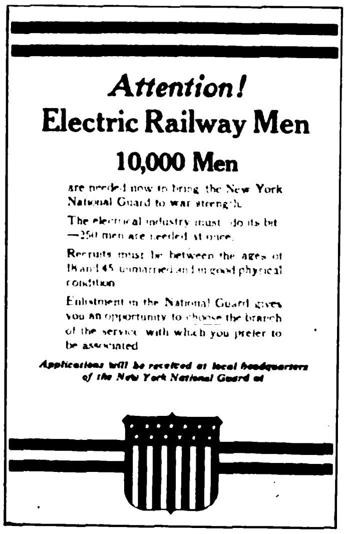
Women Now on the Front Platform in Glasgow—N. Y. E. R. A. Assisting in National Guard Recruiting—Editors Confer with Government Department Heads

At the present time nearly 300 women, formerly employed as conductors, are engaged in operating surface cars on the Glasgow Corporation Tramways—the first railway system in Great Britain to replace large numbers of motormen with women operators, and James Dalrymple, general manager of the system, has appealed to every suitable woman conductor to undergo a course of training in order to release motormen for government service. In the training of women for duty on the front platform, exactly the same course is followed as with men, the arrangement being in the hands of the traffic superintendent, while the instruction is given by an experienced engineer at the company's school for motormen.

The course of instruction extends over a period of twelve days, during which full wages are paid, and it is open to all conductors after a period of satisfactory service as conductor ranging from six to twelve months. The first four days of the course are taken up in oral instruction in connection with a skeleton car in the company's school. For the next four days the beginner is sent out on the road under the care of an experienced motorman who has been specially authorized to instruct students. On the eighth day the beginner goes back to school for a preliminary examination in knowledge of car details and platform duties, and following this the next three days are again spent on the road in regular service under an experienced motorman. The afternoon of the twelfth day is taken up with a final examination that is conducted by the chief instructor at the motormen's school, satisfactory candidates being passed after having certificates forwarded to the head office.

ENLISTMENT POSTER IN NEW YORK

A strong effort is being made by the Citizens' Preparedness Association of New York State to encourage enlistment in the National Guard in accordance with the request of the War Department that the existing organization be recruited to war strength before it is taken into the federal service. The different trades and industries have been listed, and arbitrarily quotas have been assigned to each. That for the electrical industry has been set tentatively at 250. To aid in this movement the New York Electric Railway Association is distributing among the electric railways of the State red, white and blue placards like that shown in the accompanying illustration, these being intended for posting in carhouses and other prominent positions.



Attention!

Electric Railway Men

10,000 Men

are needed now to bring the New York National Guard to war strength.

The electrical industry must do its bit —250 men are needed at once.

Recruits must be between the ages of 18 and 45 unmarried and in good physical condition.

Enlistment in the National Guard gives you an opportunity to choose the branch of the service with which you prefer to be associated

Applications will be received at local headquarters of the New York National Guard at

ELECTRIC RAILWAYS IN WAR TIMES—ENLISTMENT POSTER IN NEW YORK

EDITORIAL CONFERENCE AT WASHINGTON

A meeting of the editors of the technical and business papers to determine how these periodicals can best assist in the war was scheduled to take place in Washington, D. C., on May 25. Arrangements were made for short addresses during the morning from the following: George Creel, chairman committee on public information; Francis S. Peabody, chairman fuel board, Council of National Defense; David F. Houston, secretary of agriculture; Franklin K. Lane, secretary of interior; Newton D. Baker, secretary of war; Josephus Daniels, secretary of navy; William C. Redfield, secretary of commerce; Frank A. Vanderlip, president National City Bank, New York City; and William B. Wilson, secretary of labor.

The program for the afternoon included addresses from Van H. Manning, director United States Bureau of Mines; Herbert C. Hoover, food administrator; Walter Gifford, director Council of National Defense; Frank Scott, chairman munitions board, Council of National Defense; Dr. Martin, in charge of Red Cross work, Council of National Defense; Fairfax Harrison, chairman, or some other member of the railroad executive committee, Council of National Defense; George Otis Smith, director United States Geological Survey, and R. W. Woolley, director of publicity, Liberty Loan of 1917.

During the year 1916 there were 108 persons killed and 416 injured in grade-crossing accidents in the State of California. There are 10,000 grade-crossings in that State.

American Association News

Chairman of Committee on Company Sections Addresses Open Letter to Railway Managers—Bulletin o Committee on National Defense Is Reprinted in Full—Reports of Section Meetings Show Great Diversity of Topics Treated

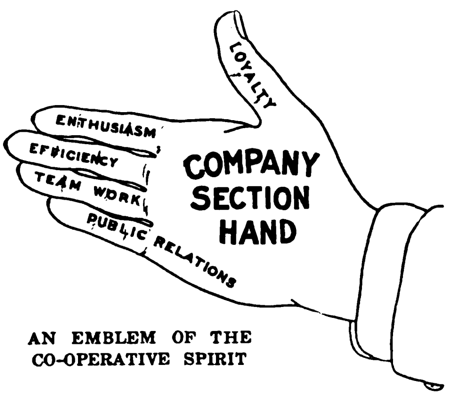
Why Not Extend the Company Section Hand to Your Organization?

An Open Letter to the Managers of Electric Railways in the United States

BY MARTIN SCHREIBER
Chief Engineer Public Service Railway, Newark, N. J.

At present there are eleven company sections in the American Electric Railway Association. The fact that these sections started with 1000 members and now have 1900 stands out as indisputable evidence of the success of the company section movement. There has never been a time when the association has had a better opportunity to help the electric railway company than right now, and one way in which it can do this is by the organization of company sections.

To-day the electric railway industry is facing a fixed fare, regardless of the great advance in cost of labor and material. The price of labor and material is governed by the open market, and you cannot escape taxes, insurance or carrying charges. Until increased rates are allowed about the only opportunity for saving is to increase the yielding power of the organization. We invent machines to do more work; we devise new methods to increase efficiency; but have we spent sufficient effort to bring out the full possibilities dormant in our individual employees?



AN EMBLEM OF THE CO-OPERATIVE SPIRIT

Did you ever stop to think that it is not uncommon for men employed at piece work to produce one and one-quarter times the work of men hired by the day? Suppose each man could do one-tenth more work on a railway system than he is doing. On a system with $1,000,000 gross income the operating expenses would be $650,000, approximately speaking, of which $325,000 would be for labor. Ten per cent would represent a saving of $32,500. For a property with $10,000,000 gross the saving would be $325,000 a year. However, you should keep in mind that the greater yielding power of an organization may also be developed in ways other than by saving of actual hours, because you must take efficiency into consideration, such for example as is produced by power saving. It has been consistently shown that careful operation of cars often saves ten per cent on the power bill.

Again, you can make money by ways other than saving it; you can spend money advisedly so as to get new business, and increase your revenues by advertising. The best advertisement is good and attractive service, performed by willing, courteous and intelligent representatives.

To be brief, is not the real answer to the efficiency question found in training your employees, and isn't the company section an ideal training camp?

First, you want loyal men. Men are loyal when the company shows an interest in them. It's sort of a "fifty-fifty" proposition. Forming a company section shows the employees that the company is trying to help them.

Second, the company section promotes personal ambition. Personal ambition is a promoter of enthusiasm. Enthusiasm is absolutely necessary for every progressive and successful business.

Third, where you have kindled honest enthusiasm, you unconsciously inspire a thirst for knowledge. Here is where a company section can do wonderful work; the possible activities hardly need comment.

Fourth, as soon as employees of the electric railways begin to obtain knowledge of the electric railway business, just then is when they begin to become more efficient and realize the tremendous power of team work, which is now looming up so formidably in military operations.

Fifth, with the cultivation of loyalty, enthusiasm, efficiency and team work among the employees, it goes without saying that you will develop great improvement in public relations.

These are a few reasons why the writer believes that the electric railway companies should extend the company section hand to their organizations.

Co-operation for National Defense

Some weeks ago the American Association Committee on National Defense sent to member companies, over the signature of Gen. George H. Harries, chairman, a bulletin containing specific suggestions as to what can be done to prepare electric railway properties for active co-operation with the government. By way of supplementing the committee's mail campaign and to remind the electric railways again of the importance of prompt action on their part the bulletin is reprinted below in full.

To Member Companies:

After having studied with some care such interesting information as has been received from nations in Europe now at war, the Association's committee on national defense presents for your consideration the following suggestions with respect to matters that are now or may soon be of material interest to you.

One of the immediately essential things is the protection of the property of each company. In view of property destruction which has already taken place in this country and because there undoubtedly are many conspiring enemies within our borders, we suggest that attention be promptly given to:

(a) The protection of strategic points of railroad line, such as bridges, tunnels, junctions, dispatching stations, and of coal supply and transmission lines.

(b) The inclosing of power-house yards with heavy fence and ample lighting of such yards and of areas around the storehouses, shops and carhouses.

(c) The furnishing of all power-house and shop employees with badges and permits so as to pass the watchman in charge who should, so far as possible, be acquainted with each individual.

(d) The selection of men in each plant for "special officer" duty so that they may be used as police when occasion arises.

(e) The careful scrutiny of personnel of employees.

The continued operation of all transportation agencies is a vital necessity to the national defense and it is therefore desirable that all officers essential to the transportation service continue in their present positions in so far as possible, rather than enlist for active service under the government; however, as a large body of electric railway employees in various branches of service will undoubtedly be required for army duty, we suggest:

(a) That each company should make a list of the men who would probably thus leave the company's service—so that the company could reasonably estimate upon the vacancies which would have to be filled under such circumstances.

(b) In connection with the foregoing it would undoubtedly be desirable to have lists of applicants previously rejected by the company because of some physical disability; so that those of them who could be used in emergency might be readily accessible.

(c) That consideration be given to the possible use of women as conductors and for other positions in the company's service. This should be carefully studied.

(d) That it would be well to have a complete census of all employees so as to have on record their varieties of usefulness and their special ability along certain lines of service which might or might not be military.

(e) That consideration be given to the laying in of supplies difficult to obtain in time of war.

(f) That thought be given to the possible adoption of portion of shop equipment and space for the manufacture of supplies or repairs essential to army transport.

(g) That arrangements be made for duplicate power supply to provide for possible break-down or to meet unusual demands.

Because of the call for military service it is desirable that companies be in a position to assist in the selection of individuals by government officers, and we would therefore suggest that:

(a) A list be made of available men who might be used as non-commissioned officers in the engineering corps of the army.

(b) The free use of available carhouses and offices for recruiting and medical examination of employees and others be offered.

(c) There may be outdoor recruiting assistance by advertising cars carrying brass bands, speakers, etc.

(d) There be plans for collection in cars or at carhouses of money contributions for comforts to be forwarded to soldiers and sailors.

Many transportation corporations have adopted the following policy in the treatment of such of their employees as may enlist at the present time:

Positions will be available for such employees upon their discharge from National service, but no compensation will be made to such employees during the terms of such service. This does not refer to men who have previously enlisted in the National Guard.

The question of tariffs which must be filed with the War Department in order that the movement of men and supplies by electric lines may be authorized has been taken up with the War Department by the committee, and as soon as definite information is received it will be communicated to member companies.

Attention is called to the desirability of co-operation in the matter of keeping down the cost of living. It may be said in this connection that several member companies have already offered, rent free, plots of vacant land in their possession, to such persons as are willing to cultivate them for the purpose of raising garden truck and other crops.

It is possible that many lines will be called on for abnormal increases in service due to the carrying of men, munitions and general supplies to coast defense works, mobilization points, munitions and other factories. The conditions thus likely to be created might well be studied in advance so that high efficiency may be possible as soon as the pressure begins to be applied. Prospective sidings, extensions, increases in equipment and related matters may well be considered at this time by companies in very many communities.

The committee is prepared to do all in its power to secure for member companies any specific information which may be asked of it and will devote itself to the duty of assisting in an orderly solution of a national problem, in which problem each company is an element.

Recent Committee Meetings

At a meeting of the T. & T. Association committee on construction of schedules and time-tables held in New York on April 24, the discussion centered on the subject of traffic in congested districts. The meeting was attended by Alexander Jackson and H. C. Donecker, Newark, N. J.; H. F. Fritch, Boston, Mass.; J. A. Stoll, Baltimore, Md., and F. L. Hubbard, Toronto, Ont. It was decided that the following members should visit the cities designated for the purpose of studying the topic in hand: Messrs Stoll and Jackson, Newark, Baltimore and Cincinnati; Messrs. Hubbard and Fritch, Cleveland; Messrs. Dana and Fritch, Springfield, Mass., and Mr. Dana, New Orleans. These visits will be made at early dates.

A joint meeting of the two association committees on electrolysis (American and Engineering) was held in New York on May 4. The matter under discussion was the proposed form of the final report of the national joint committee on electrolysis, on which committee the associations are represented by Calvert Townley, New York City; A. S. Richey, Worcester, Mass., and R. P. Stevens, Youngstown, Ohio. In attendance at the meeting were Messrs. Townley and Richey, and E. J. Blair, Chicago, Ill.; E. B. Katté, New York City, and I. W. Gross, New York City.

Signal Oil Discussed in Chicago

At the regular monthly meeting of the Elevated Railroads company section held on May 15, the principal speaker was John W. Bunn of the Galena Signal Oil Company, who presented a paper on "Signal Oil." The report of a local committee appointed to consider the "Definitions of Electric Railway Transportation Terms" submitted by the T. & T. Association for study by the company sections was presented and ordered forwarded to the secretary of the American Association. The formal part of the program was relieved by instrumental and vocal music and athletic events.

Public Service Section Visits Power Plant

A party of 165 members of the Public Service Railway Company section spent the evening of May 17 at the Essex power plant of the Public Service Electric Company, which is located on the Passaic River, 2½ miles east of Newark. The party assembled in Newark and was taken to the plant in special cars. Representatives of the electric company familiar with the details of the plant escorted the men through the station and explained the working of the equipment.

This plant, of which details will be given in a later issue of the ELECTRIC RAILWAY JOURNAL, is the latest one constructed by the electric company. At present two 25,000-kw. turbine units are in operation, and one of 35,000-kw. capacity is being installed. The boiler plant is also being extended and an order for a 50,000-kw. turbine unit has been placed for delivery in 1919. It will be some years before the plant reaches its ultimate capacity, which will be more than 200,000 kw.

Patriotism Displayed by Milwaukee Section

The regular meeting of Section No. 1, held on May 10, with an attendance of seventy-five, was largely of a patriotic character. Sergeant-Major Albert Wood gave a talk on life in the trenches, based on personal experience in campaigns in which he had been several times wounded. He was loudly cheered by the audience. R. B. Stearns followed with an outline of the duty of the American citizen, after which the color squad from a local United States recruiting station marched in. An officer read a telegram calling for volunteers for the telephone and telegraph divisions of the army.

In addition to the patriotic number there was an illustrated address by R. C. Gosrow on "A Trip Through California," with particular reference to the steel industry.

Educational Work of Toledo Section Is Successful

At the meeting of company section No. 11, held on April 27, a report of the group work committee was presented, showing encouraging interest in the educational work. The total weekly attendance on the sessions of classes in arithmetic, algebra, electricity, drafting, bookkeeping, gas work, steam boilers and painting ranged between 203 and 235, with an average attendance of 93 per cent of the registration. During the first month ninety-seven class sessions were held. At this meeting an address on "Modern Tendencies in Illumination" was given by H. H. Magdsick, illuminating engineer General Electric Company, Cleveland, Ohio. The attendance at the meeting was 150, slightly less than one-half the total membership.

"Co-operation" the Topic at Meralco Section April Meeting

At the meeting of the Manila Electric Railroad & Light Company section, held on April 3, N. Tranfaglia, track foreman, read a paper on "Co-operation," which was discussed by a number of members. Sixty-eight members responded to rollcall and twenty-two new members were added to the railway division of the section. Of these thirteen were from the transportation department, six from the commercial department and three from the power-plant department. In addition to the formal proceedings there was a fencing contest between two members of the transportation department, a song in Tagalog by a transportation department inspector and music by the orchestra composed of members of the transportation department.

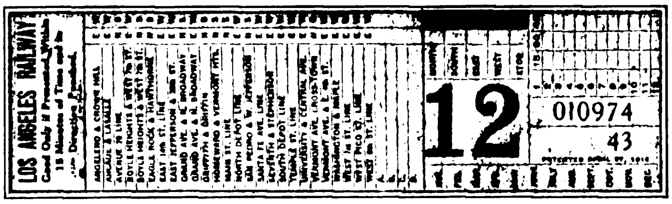
Mr. Tranfaglia began his paper with the homely adage, "Una mano non si lava sola, una lava l'altra e le due lavano il viso." This, translated into English, means, "One hand does not wash itself alone, one hand washes the other and the two wash the face." This adage, he thought, contains the germ of co-operation. Applied to electric railway work this means that an employee not only has to earn his daily bread and better his financial condition, but he must co-operate with his fellow employees and be on the watch to better his employer's interest. This involves a workable system to minimize expenditure of time and money, otherwise great wastes will result especially if a large number of men are involved. Co-operation is necessary not only to secure good results in work, but to promote good-fellowship and mutual understanding in order that one's store of knowledge may be increased. Through co-operation, men can do things that otherwise would be impossible.

In the discussion, R. E. Brooks, assistant superintendent of shops and carhouses, showed how co-operation would help his department. Frequently other departments ask for work on rush orders when by the exercise of foresight this could have been put through the regular channels without inconvenience and extra cost. This, of course, does not apply to emergencies. B. H. Blaisdell, chief engineer of power plant, referred humorously to the department which borrows from the power plant a couple of cubic meters of sand or a few tons of coal in an emergency, expecting subsequently to furnish the proper order but sometimes neglecting to do so. In his opinion the greatest enemy to co-operation is selfishness, although the desire for co-operation is inherent in most men. This quality, however, needs cultivating.

New Transfer Developed at Los Angeles

The Los Angeles Railway Corporation has in experimental service a new type of transfer, the special feature of which is that it may be used on all the lines of the company. This reduces the number of transfers required to be kept on hand and consequently the amount of waste in old transfers. The line punched is that of the issuing line, and in the column of lines there are four blanks marked A, B, C and D, which can be used for new lines. As some lines do not transfer to other lines, to prevent looping back the company will issue a book of instructions to conductors showing the points at which transfers are not issued.

Five punches are required, namely, the direction in which the car is moving, the direction in which the passenger is entitled to go, the month, the a. m. or p. m., and the time limit. The issuing line punch and the month punch can, of course, be made before the conductor starts from the carhouse and the a. m. or p. m. punch before starting on each trip. The punch showing the direction in which the passenger wishes to go may also be eliminated, because the receiving conductor should know, when a transfer is handed to him, the line by which it was issued, so that the hour is really the only punch required during the trip. The trial of these transfers is being conducted by Charles Barrington, Jr., purchasing agent Los Angeles Railway Corporation.



TRANSFER BEING TRIED IN LOS ANGELES

Arkansas Association Meets

The tenth annual convention of the Arkansas Association of Public Utility Operators was held at Pine Bluff, Ark., May 16-18. At the business session the following were elected officers for the ensuing years: President, S. E. Dillon, general manager Citizens Electric Company, Hot Springs; first vice-president, E. T. Reynolds, manager Arkansas Light & Power Company, Paragould; second vice-president, P. T. Phillips, engineer Little Rock Railway & Electric Company; secretary-treasurer, R. B. Fowles, auditor Pine Bluff Company.

W. N. Gladson, dean of the electrical department of the University of Arkansas, was elected to honorary membership in the association.

The convention voted to meet in Hot Springs, Ark., in 1918. The executive committee of the association will be appointed by the new president, and this committee will select the date for the 1918 convention. The attendance far surpassed all past conventions, from the viewpoint of the number of companies represented, there being representatives from thirty-five public utility companies of the State. C. G. Griffin, general manager Little Rock Railway & Electric Company, presided at the annual banquet.

COMMUNICATIONS

"Killing" the Trolley Wire Near Open Drawbridges

NEW YORK CITY, May, 21, 1917.

To the Editors:

In the issue of the ELECTRIC RAILWAY JOURNAL for May 27, 1916, under the heading "Prevention of Drawbridge Accidents" the following statement is made by one of your contributors: "Trolley cars are subject to accidents at drawbridges used over rivers, due to the opening of the bridge just as the car reaches it, unless some means of 'killing' the trolley wire before the bridge is opened is provided."

The suggestion which this writer makes has been advanced innumerable times in various journals, at hearings, etc., by men apparently entirely unfamiliar with the actual operation of cars over drawbridges. They overlook the fact that to be successful or satisfactory a method of stopping cars before entering a draw must be foolproof. The average car approaches a draw with the power off anyway, so that the cutting off of the power on the trolley wire has little or no effect upon the problem.

A car can as readily coast into an open draw as it can go into it with power on. Moreover, the "killing" of the trolley wire a short distance back from the draw might result in a catastrophe which could otherwise have been prevented. For instance, if upon approaching a draw a motorman should shut off his power and apply his brake, and should find that, due to a broken brake rod, lack of air, or for any other cause the brake mechanism was inoperative, he should immediately, in accordance with instructions, apply his reverse. While he could, with a double-truck car, for a short distance get an electric brake effect without any power, he could not with a single-truck car get any such result. Thus the only means of stopping his car, his brake mechanism having failed, would have been taken away from him by the unique device of having "killed" the trolley wire in the vicinity of the bridge.

"RAILWAY MANAGER."

Speeding Service by Educating Public

BURLINGAME ELECTRIC RAILWAY

BURLINGAME, CAL., May 19, 1917.

To the Editors:

I have read with great interest the articles which have appeared in the ELECTRIC RAILWAY JOURNAL on attempts to educate the traveling public on safety and kindred subjects. But I have seen no suggestion from any railway that passengers waiting to board a car should be instructed to stand still as the car approaches. The average person seems to think it necessary to anticipate the stop to be made by the car by walking forward or backward, and the consequence is that on heavy lines the time lost for waiting for these persons to board the car is very considerable in the course of a day.

In the interest of saving time the average trainman will make his stop with the car entrance as near intending passengers as he can. But when the patrons walk ahead or back, accurate calculations in this respect are almost impossible.

It seems to me that if the public could be educated in safety measures, skip stops, and other ways of speeding up service, this subject should also receive attention, to the advantage of both the public and railways.

F. P. WILL, Superintendent.

Equalizer Bars Not Necessary for Either Easy Riding or Safety

NEW YORK, WESTCHESTER & BOSTON RAILWAY

NEW YORK, May 22, 1917.

To the Editors:

I have been very much interested in S. A. Bullock's article published in your issue of April 21 regarding the need for equalizer bars for electric trucks, as well as in the discussion that has followed the original article. A second reading leaves one strongly with the impression that the case in favor of the equalizer bar has been made mainly out of arguments over points of fact.

In the article in question the equalizer bar is advocated for high-speed service on two grounds. One of these is that the equalizer bar, alone, gives proper distribution of the load over the four wheels of the truck. But this load-distribution, as pointed out in W. F. Kiesel's clearly thought-out communication in the issue of May 5, affects particularly the ability of the truck to stay on the track, and a truck in which the load is improperly distributed over the wheels must, of necessity, be frequently derailed if run at high speed. Therefore when Mr. Bullock says that the use of springs over the journal boxes (instead of equalizer bars) gives improper load-distribution, he says in effect that trucks built according to all such designs must be subject to derailment.

Yet would anyone want to claim that the Pennsylvania Railroad's standard four-wheeled passenger trucks, which do not have equalizer bars, are frequently derailed? On the New York, Westchester & Boston Railway the car trucks have springs over the journal boxes and no equalizer bars, but five years' experience without a single derailment of these cars in high-speed service has demonstrated that the equipment is the safest in the country. Hence, in Mr. Bullock's statement that equalizer bars are necessary for high-speed trucks he submits, as his argument, a personal opinion to oppose the established fact that cars which do not have equalizer bars have been operated for years in perfect safety.

The second reason put forward in the article in support of the equalizer bar is that, without it, springs must be installed over the journal boxes and that these occupy an unduly large space. Undoubtedly, the idea intended here is that the available space over the journal box is too small for springs of proper amplitude, and that in consequence cars without equalizer bars must ride badly. Here again is a personal opinion opposed to an established fact. The Westchester car trucks have enough space over the journal boxes even for springs much longer than those actually used. At the same time the Westchester cars ride easier than any of the cars with equalizer-bar trucks that are in similar service in the same district, and the difference in riding qualities is so marked that it is apparent at once to anyone who rides on these cars.

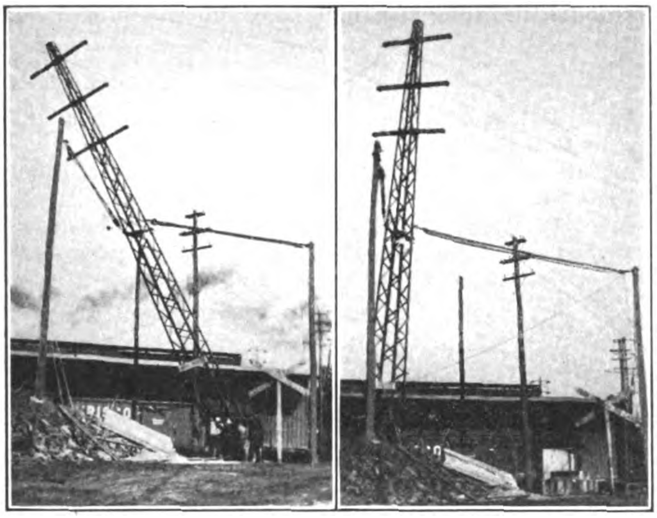
It may be that reasons, other than the two mentioned, exist for the use of equalizer bars in high-speed service, but if they have to be supported by arguments based on the non-existence of established facts they are not likely to prove the use of equalizer bars to be necessary. Indeed, since modern cars that are both easy riding and safe against derailment can be, and have been, built without adopting the equalizer-bar construction, it seems proper to say that equalizer bars are not even permissible, because of the undesirable increase in weight and complication which their use involves.

R. R. POTTER,
Superintendent of Equipment.

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.



MOVING STEEL TOWER WITH GIN POLES

Steel Tower Moved in Thirty Minutes

Two Gin Poles Used to Transport a Transmission-Line Tower 30 Ft.

BY E. B. HOOK, JR.

Superintendent of Construction, Georgia Railway & Power Company

On account of changing the direction of a street in Rome, Ga., the 75-ft., 4-ton steel tower shown in the accompanying illustration had to be moved 30 ft. to bring it to one side of the roadway. This operation was performed by means of two 40-ft. gin poles, thirty minutes being required to move the tower and bolt it to the new concrete foundation. Snow and sleet were falling during transportation. The insulators were removed from the tower and the 66,000-volt lines temporarily supported on wood poles. Blocks and tackle were fastened to the tower and the gin poles, which were erected and guyed at each end of the line along which the tower had to be moved. After the tower had been tilted in the direction it was to be moved the tackle on the pole toward which it leaned was hauled in, thus dragging the base of the tower into its new position. The other gin pole and tackle prevented the tower toppling over entirely.

The "Swing-Frame" Grinder

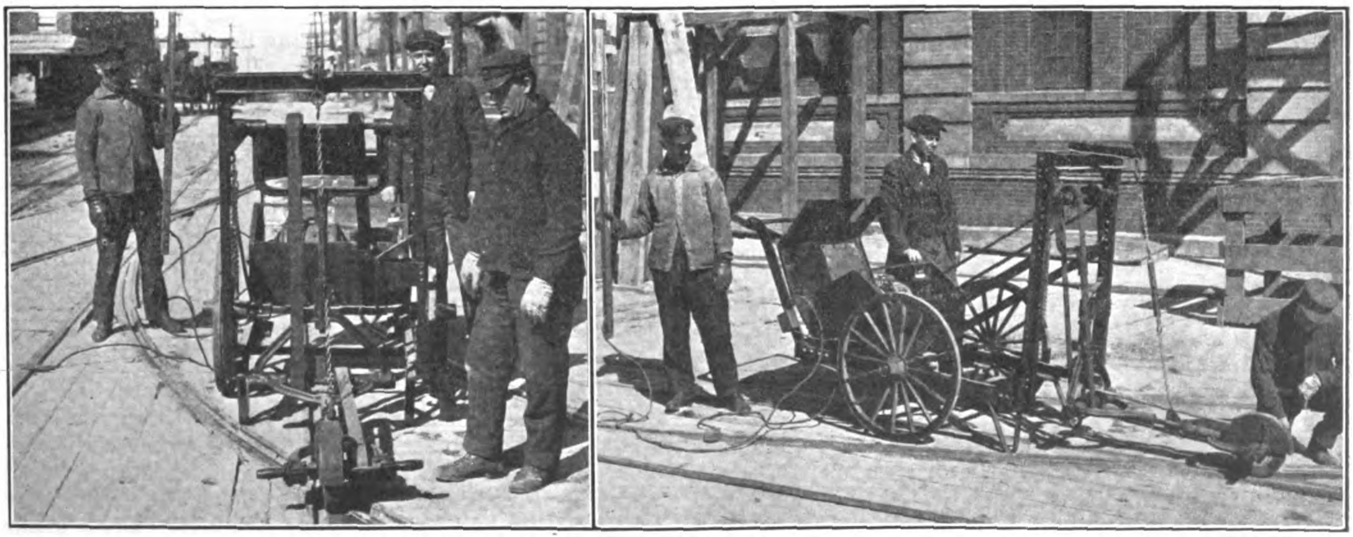
A New and Effective Machine for Grinding Rail Grooves, Switch Tongues, Frog Points, Etc.

BY R. C. CRAM

Assistant Engineer Way and Structure Department
Brooklyn Rapid Transit System

The machine which is described in this article was developed for the purpose of accomplishing the same results as are produced with the several makes of flexible shaft grinder but with a form of drive which would be less expensive for maintenance. A rather cumbersome machine was first put together and, after trial results had indicated that the principles were applicable to this work, the refinement of the machine was carried out with the co-operation of the mechanical department of the company.

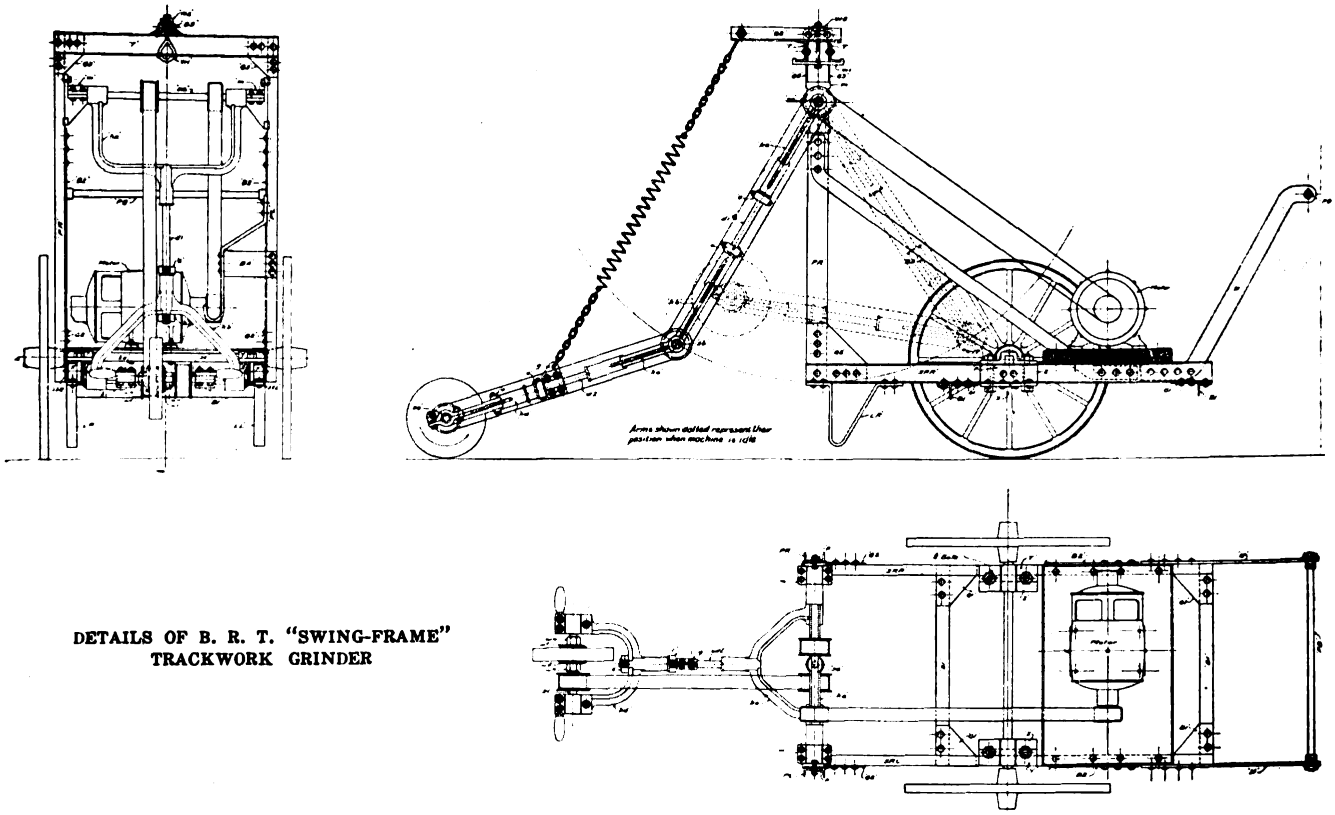
The resulting machine is shown in the illustrations presented herewith. For want of a better name it has been called a "swing-frame" grinder. The drive is by belts from an electric motor to two countershafts, each mounted in yoke-shaped castings. The upper casting is mounted upon channel-iron posts, and this casting supports a vertical arm which in turn supports a yoke carrying a horizontal arm, at the outer end of which is another yoke to which the grinding wheel is attached.



"SWING-FRAME" GRINDER DEVELOPED BY BROOKLYN RAPID TRANSIT COMPANY FOR SPECIAL JOBS IN TRACK WORK

Each arm is arranged to swivel, thus providing for horizontal lateral movement and angular movement as required in grinding grooves. The combination is such as to provide a universal movement for any desired position of wheel and any direction of movement. It will be noted that the pulleys are kept in fixed positions which, in turn, secures constant tension on the belts at all times.

The horizontal arm which carries the grinding wheel is supported from a short outrigger arm by a spring of sufficient strength in tension to hold the grinding wheel above the ground except when force is exerted by the operator when he is ready to grind. This spring also takes up initial shocks in the wheel when first attack is made, and greatly relieves the strain on the operator when controlling the wheel. When not in use the swing frame holds back toward the platform and the horizontal arm is held in place by a hook.


Arms shown dotted represent their position when machine is idle

DETAILS OF B. R. T. "SWING-FRAME" TRACKWORK GRINDER

The machine can be handled by one man in an emergency but it is customary to have two men besides the operator. One of these attends to the overhead power contact device and the starting of the motor, while the other acts as flagman to protect the operator and apparatus. It is our custom to have three men with all grinding outfits.

The machine is operated by a 3-hp. Diehl continuous-duty, 550-volt, d.c. motor, having a speed of 1500 r.p.m. The motor is protected by a light steel asbestos-lined housing which appears in the halftones but is not shown in the drawing. The complete outfit, without grinding wheels, costs about $350, when prices of motors and materials are normal. The development of the machine has been directed by C. L. Crabbs, engineer of way and structure of the B. R. T. System.

A city system in the Far West is not buying new axles but works over old Pullman axles as follows: Axles of 5½ in. to 6 in. diameter are heated to a cherry red heat to break out crystallization and then turned down to 5 in. diameter. Old 5-in. axles are hammered down to 4¼ in. and turned down to 4 in.

Change in Lubricating Methods Effects a Big Economy

Cost of Lubricants per 1000 Car-Miles Reduced from 84 Cents to 22 Cents by Using Proper Lubricants and Oiling Scientifically

BY F. H. HILL
General Manager Elmira Water, Light & Railroad Company, Elmira, N. Y.

Master Mechanic H. C. Kaercher has reported that a considerable saving in the cost of lubrication has been accomplished in our shops by changing both the method of doing the oiling and the kind of lubricants used. Our cars are equipped with many different types of motors, most of which are old style and of General Electric Company make. The old method was to oil the armature and axle bearings and the gears of every car every night. The oiler had eighteen or twenty cars to handle during the night, and as he had to hurry his work he did not do it well and a great deal of the lubricant was wasted.

The method which has effected economy both in the quantity of lubricants used and in the labor consists in inspecting the cars after every 1000 miles of service, and the cars are oiled only at the time of inspection. No work is now done at night. The oiler is on the day shift and as he has only four or five cars a day to handle he can do the work thoroughly. The journal boxes are kept clean, covers are repaired and kept on and the brasses are kept in good shape. After completing this work the oiler has time for other duties in the shop.

With this method of doing the oiling it was necessary to select lubricants which would stand 1000 car-miles of service without being replenished. For the gears U. S. Graphite No. 2 grease was found to be of the right consistency. This collects at the bottom of the gear case and will not leak out or creep out along the shaft. For the armature and axle bearings No. 2-H. Tulc, a grade of solidified oil made by the Universal Lubricating Company, Cleveland, Ohio, was used with No. 2-J. P. Tulc waste. This combination proved to have the right consistency so that the lubricant would not run away.

The following figures show how the cost of lubricants alone was reduced as this method was put in operation and gradually improved upon. The cost of all lubrication is given. It includes oil and waste for the car motors, journals, air compressors, gears and pinions, side and center bearings, brake rigging, etc.

COST OF LUBRICANTS

January to April, inclusive, 1915	$360.42
Average cost per month	90.10
Average cost per 1000 car-miles	.84
May to August inclusive, 1915	187.01
Average cost per month	46.75
Average cost per 1000 car-miles	.37
September to December, inclusive, 1915	115.28
Average cost per month	28.82
Average cost per 1000 car-miles	.25

The average cost of lubricants for 1915 was 49 cents for 1000 car-miles. During 1916 by still further perfecting the method described, the cost has been reduced to 22 cents per 1000 car-miles, although the price of lubricants has gone up about 25 per cent. To these figures must be added the labor saved and the benefit derived from better lubrication to obtain the economy of a new lubricating system.

Flexible-Base Jacks in Pole Handling

On one of the large city railway properties the customary method of raising a track blockade caused by a derailment or the breaking down of a wagon or truck has been expedited by the use of flexible-base jacks. Now, instead of sending out a heavy slow-moving emergency wagon equipped with jacks, and block and tackle, a light motor truck which can make 40 m.p.h. if necessary is sent out when the emergency call arrives. The equipment of the light truck on this particular property includes a Templeton, Kenly & Company, Ltd., No. 310 Simplex emergency jack designed with a flexible base so that it will not only lift but can also shove at an angle to the pavement. By the use of this jack it is possible in many instances to slue a broken-down truck out of the way of the street cars or to rerail a car long before the heavy emergency wagon would arrive.

Many railway and lighting companies have taken up the use of heavier flexible-base jacks for handling poles, particularly for use where the poles must be pulled or moved in the ground. For such use the pole jack includes 8 ft. of chain for getting a bite on the pole, a long steel lever bar, and an I-beam base to furnish bearing on the pavement or in soft soil. By means of the flexible-base jack, poles are easily pulled out without digging up the pavement, or if it is necessary to move a pole or to straighten it, a flexible-base jack and its base and chain provide simple equipment for quickly doing the work with fewer men than were required before.

Notes on Small Tool Practices in International Railway Shops

Tools for Making Trolley Wheels, Brake Hangers, Turning Wheel Tires, and Boring and Turning Bearings

In the Cold Spring Shops of the International Railway, Buffalo, N. Y., there are many special tools and jigs which have been developed to assist in keeping down maintenance cost. G. W. Dunlap, superintendent of power and shops, has furnished information on which the following notes are based.

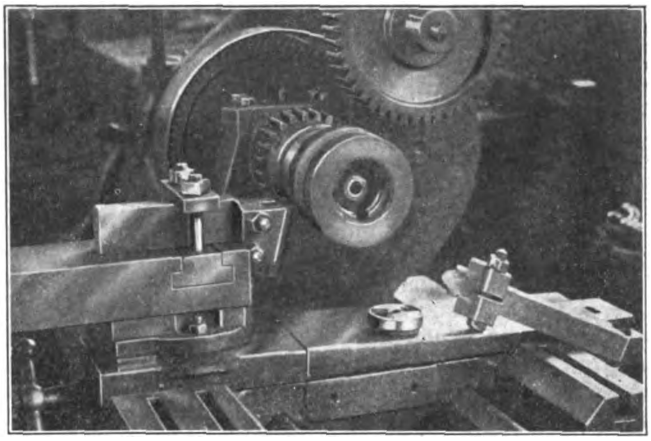


FIG. 1—TROLLEY WHEEL CHUCK AND FORMING TOOL FOR OUTSIDE SURFACE

This company makes its own trolley wheels in 6-in. and 4-in. sizes. For the 6-in. wheel a plan is used by which it is possible to rough-bore, face, ream, and turn one end of the hub in one operation consuming ten minutes. For this purpose the rough casting is mounted in a chuck like that shown in Fig. 1. This chuck consists of three pieces, the first of which is screwed onto the lathe spindle. On this is screwed the second piece which forms the backing for the trolley wheel, which is securely clamped against it by means of a nut.

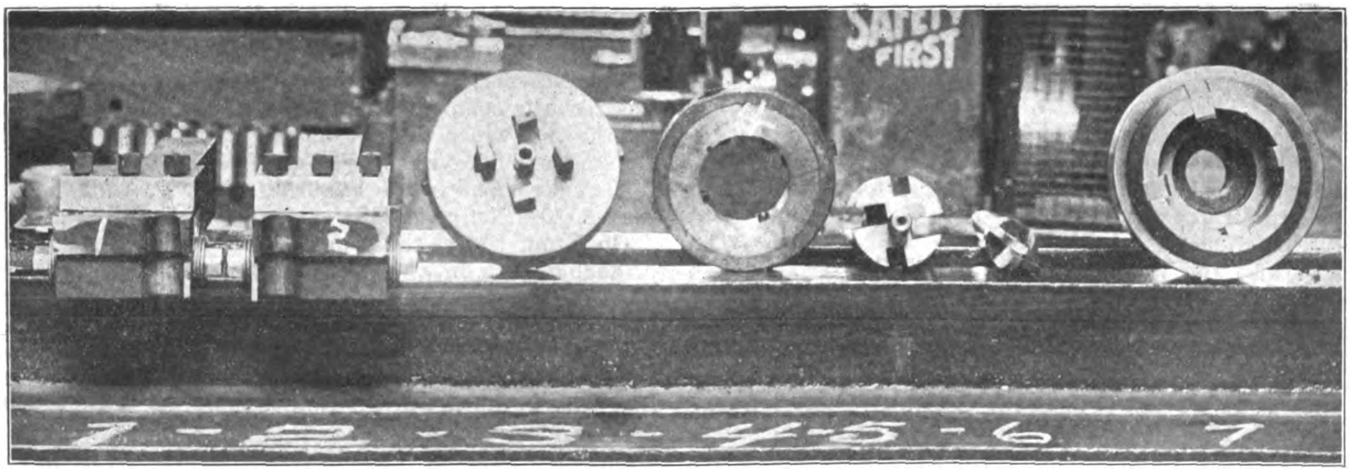


FIG. 2— TOOLS MADE AND USED IN COLD SPRING SHOPS, INTERNATIONAL RAILWAY—1, 2, PAIR OF FLANGING TOOLS FOR TIRE LATHE; 3, 4, 5, TOOL FOR SURFACING END OF BALL HANGER; 6, TOOL FOR FORMING SPHERICAL SEAT FOR BALL HANGER; 7, SELF-CENTERING CHUCK FOR TROLLEY WHEEL

The groove is surfaced by means of a special cutter of high-speed steel, held by means of a dove-tail tenon in a holder. This cutter is 4-in. long and has a wear life of one year. The cutter and its holder are shown resting on the tool post carriage in the figure. A drill guide, also seen resting on this carriage, is used to center the drill, which is carried by the tailstock. After drilling, the hole is reamed and the bushing is pressed in. For the outside cut a speed of 50 r.p.m. is used, and for the boring and reaming 200 r.p.m.

For the smaller wheels a special centering chuck is used which is shown at the extreme right, No. 7, in Fig. 2. This consists of four jaws, hinged at the back, and forced radially inward by a taper on the inside of the threaded ring which surrounds the chuck. This ring has four square threads to the inch. For the outside work on small wheels, the same kind of a cutter is used as with the large ones.

For the purpose of forming the ball on the head of the iron brake hangers, and the spherical seats in the sockets in which the heads of the hangers play, tools of the form shown in the center of the group in Fig. 2, Nos. 3, 4, 5 and 6, are used. These cutters are used in a drill press.

Details of the tool used in forming the heads are shown as Nos. 3, 4 and 5 in this figure, the complete tool being No. 3. It contains four cutters, two for roughing and two for finishing. The manner in which these cutters are held is shown in Nos. 4 and 5, where the central portions and cutters have been removed. No. 4 is the clamping ring and body of the tool, into the center of which fits snugly the slotted core. The cutters are held securely in the slots by means of the set-screws visible in the picture. No. 6 is the four-blade cutter used for making the spherical seats.

At the left in Fig. 2, Nos. 1 and 2, are front views of a pair of tire-turning tools designed to permit the reduction in the waste of cutter metal to a minimum. The original feature is a forged steel holder for the cutter, provided with three set-screws above, and clamp screws and washers to prevent sidewise motion. The lower part of the holder projects to give all possible support to the cutter and it is shaped to the contour of the cutter for the same purpose.

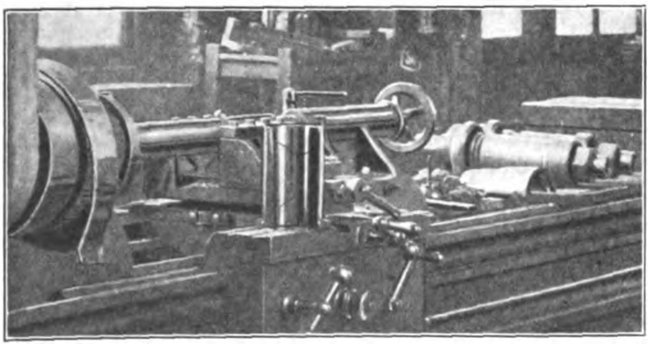


FIG. 3—BORING BAR AND MANDRELS FOR USE IN FINISHING BEARINGS

Fig. 3 shows a boring bar used in boring bearings and also the mandrels upon which the bearings are mounted for outside turning. On these mandrels they are clamped by means of the collars and nuts. The joint surfaces of the bearings are faced in a milling machine with the multiple cutter described in the issue of the Electric Railway Journal for April 7, 1917, page 654. In common with other companies, the International Railway uses old axles for various purposes, for example, large nuts are made out of this stock. As the journals of car axles wear down the bearings used with them are reduced in size. When no longer useful as such the car axles are turned down into motor axles. Old-style motor cases are rebored for use with larger bearing shells. Other practices used in this shop have been described from time to time in short articles in this department.

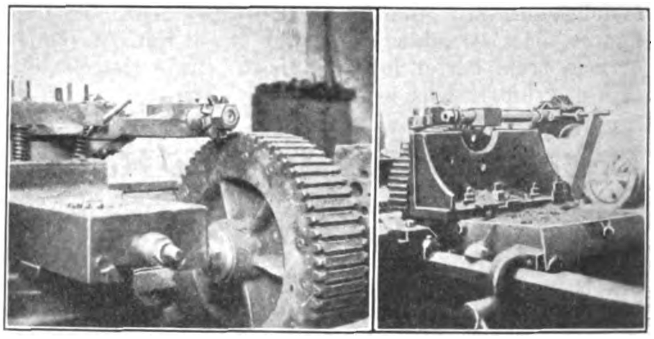
Fiber Gear Cut by Device Rigged Up on Lathe

By G. B. Sisson

Mechanical Department Georgia Railway & Power Company, Atlanta, Ga.

Our shop is not equipped with a milling machine, and when it became necessary to cut teeth in a large fiber gear a machine lathe with a 36-in. bed and an air drill were set up to do the work, as shown in the accompanying illustration.

The milling wheel for cutting the gear was attached to a 1½-in. shaft supported at one end from the tool holder of the lathe by a heavy steel arm 5-in. wide and at the other end by an air drill which was attached to drive it. To fasten the gear blank in the lathe the tailstock was removed and in its place a heavy angle plate was fastened. The gear blank was clamped to a mandrel, which in turn was bolted to the heavy angle plate. In order to feed the milling wheel through the gear the lathe was started up and the feed on the carriage used.



LATHE AND AIR DRILL USED TO CUT TEETH IN FIBER GEAR

After cutting several teeth it was noticed that the milling wheel became hot. To overcome this a hose was connected to the exhaust opening of the air drill so that the exhaust air was directed onto the cutter. In this way the milling wheel was kept cool. The gear when finished looked like a regular factory job.

Use of Welder and Old Joint Plates Effects Big Saving at Fort Worth

The Northern Texas Traction Company, Fort Worth, has recently completed at a cost of $750 some track rehabilitation which will put off a heavy track expenditure for at least five years. The method used was similar to that described in the Electric Railway Journal of May 5, 1917, on page 832.

On Front Street the company has about a half mile of double track on which almost every joint was broken. Most of the joints were of the Continuous type with a few of the old, butt-welded Thermit type. To make the new joints, the bottom web of the continuous plates was sheared off. The plates were then reversed, welded to the rails by means of an Indianapolis arc welder and ground down with a reciprocating rail grinder. The average cost per joint, including cutting in 6-ft. to 10-ft. lengths, was $4.50. Of the total cost of the job, $750, $500 was for labor, while the remainder covered welding metal, sand, cement and brick paving.

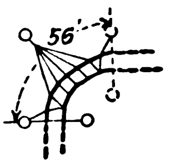
Cost of Erecting Overhead Work—IX

(From the records of a large Eastern company)

The following is the ninth group of a series of diagrams with figures to show the actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. The preceding groups of this series were published in the issues for Jan. 20, page 127; Jan. 27, page 173; Feb. 10, page 260; Feb. 24, page 355; March 10, page 447; March 31, page 606; April 14, page 702, and May 12, page 880. The remaining groups will appear later.

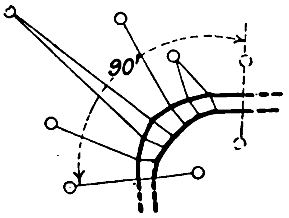
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Double track plain curve, angle 90 deg.



	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
62	$12.76	$5.28	$15.95	$6.60	$19.14	$7.92

Double track plain curve, angle 90 deg.



	Light		Ordinary		Congested	
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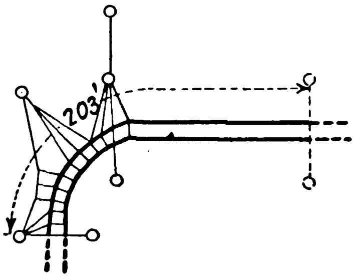
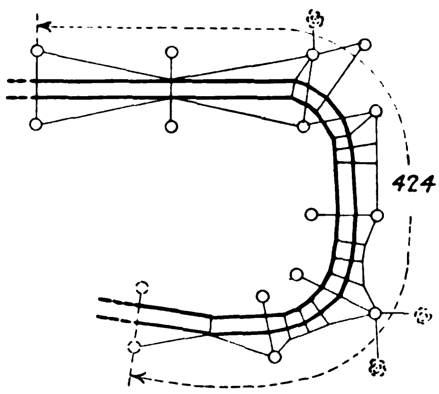
Double track plain curve, angle 90 deg.



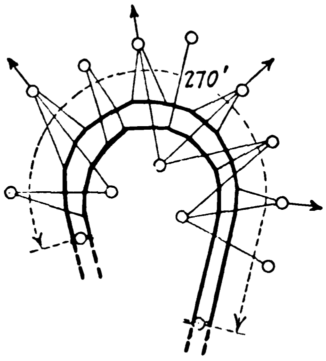
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
64*	$18.15	$13.20	$23.60	$17.16	$29.04	$21.12

Double track loop



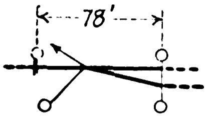
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
65*	$27.23	$19.80	$32.67	$23.76	$45.38	$33.00

Double track loop



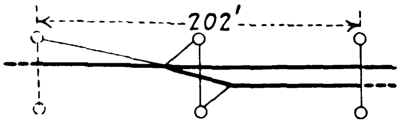
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
66*	$27.23	$19.80	$36.30	$26.40	$54.45	$39.60

Right hand turnout



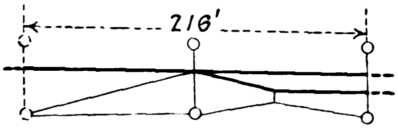
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
67	$7.98	$3.30	$11.17	$4.62	$14.36	$5.94

Right hand turnout



	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
68	$9.57	$3.96	$12.76	$5.28	$15.95	$6.60

Right hand turnout



	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
69	$11.17	$4.62	$14.36	$5.94	$17.55	$7.26

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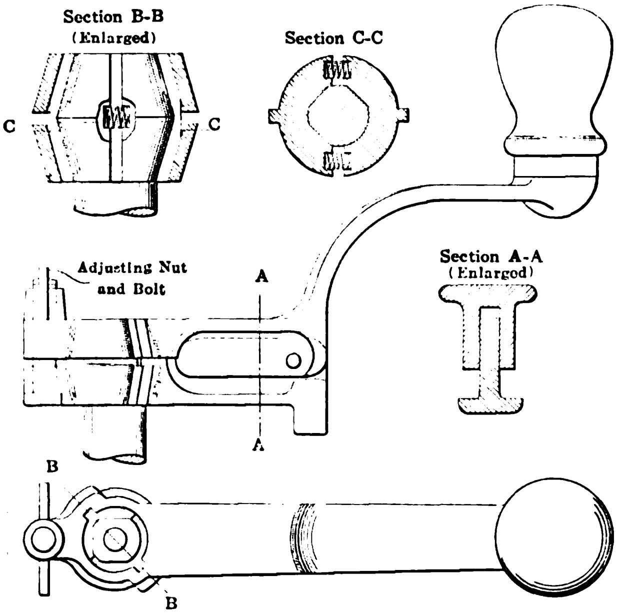
*Trucking includes cost of extra reel truck. None of the figures on this page includes cost of superintendence and engineering.

Spring Chuck for Taking Up Wear in Controller Handles

For taking up lost motion in controller handles the United Railroads of San Francisco, Cal., is using a spring chuck recently patented by one of its employees, Frederick Brostrom.

The controller handle is made in two sections. The opening in each section which receives the controller post diverges toward the center to form a double taper. These tapered openings house the chuck jaws which grip the controller post, the outside of these jaws being tapered to correspond with the tapered opening in the two sections of the controller handle. When the controller handle is not on the post these jaws are held apart by coil springs. This makes it possible to slip the handle over the post, and by tightening the nut shown on the left in the drawing the two sections of the handle are drawn together, causing the chuck jaws to grip the post firmly.

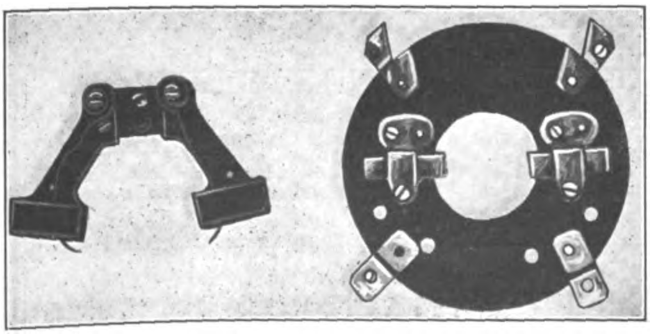


DEVICE FOR ELIMINATING PLAY IN BRAKE AND CONTROLLER HANDLES

Heater Motor Maintenance Cost Reduced

Some difficulty has been experienced by the Des Moines City Railway in maintaining the older types of heater motors, both as to bearings and brush-holders. The lubricating rings in the bearings would sometimes get stuck and the bearing would not receive the proper lubrication and would burn out. This was overcome by taking the ring out and filling the oil well with felt and thoroughly soaking this with oil. With this arrangement the motors have run all winter without attention.

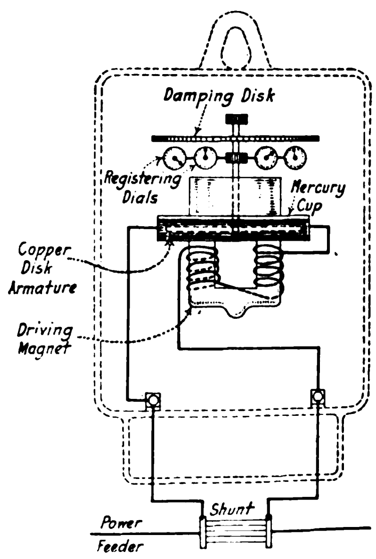
Trouble was also experienced with the older-type brush-holders because of the breaking of the small steel springs which keep the brushes in contact with the commutator. The clearance between the ends of these holders was small and oil and dirt accumulation would sometimes short-circuit the brushes so that the motor would not run at full speed. This trouble was eliminated by installing a round fiber plate 1/8 in. thick in the end of the field frame. The fiber was fastened to the frame by four clips. The brushes were then mounted on this fiber ring as shown, and small coil springs in the brush-holders behind the carbons were used to keep the latter in contact with the commutator. The holders were held in place on the fiber plate by simple clips screwed to the fiber. This arrangement also served another important purpose, as it inclosed the armature and prevented trainmen from sticking a screwdriver into the armature to push it around, a practice which frequently damaged the winding.



OLD AND NEW BRUSH-HOLDER MOUNTING FOR HEATER MOTORS

Meter for Measuring Line Loss

On power feeder lines where voltage regulation must be maintained at extremely close value, it frequently becomes a question as to whether the I^2R loss in the line, measured in dollars and cents power value, will not pay for increasing the size of the feeders. A meter which registers total ampere-squared-hours has been developed by the Sangamo Electric Company, Springfield, Ill. By multiplying the meter readings by the resistance of the feeder the kilowatt-hours of energy lost in transmission are obtained. It is then an easy matter to balance the cost of this energy against the cost of additional feeder copper.



SIMPLIFIED DIAGRAM OF METER FOR MEASURING LINE LOSS IN AMPERE-SQUARED-HOURS

This instrument, known as the I^2R meter, is similar to a standard mercury type watt-hour meter except that a series winding replaces the usual shunt-coil winding of the driving magnet. The accompanying illustration shows a simplified diagram of this meter with the internal and line connections. It is connected to the line in the same manner as an ammeter. The armature of the meter consists simply in a thin copper disk floated in mercury, and the current to be measured passes diametrically across this disk. The strength of the magnetic field of the driving magnet varies proportionately to the current in the line, and since the driving torque on the armature is proportional to the product of the current in the armature and the magnetic field strength, it is, therefore, proportional to the square of the current. The damping magnets perform their usual function in providing retardation proportional to the speed, and result is that the meter records ampere-squared-hours.

The meter has already been used with considerable success by several of the railway companies.

News of Electric Railways

Traffic and Transportation
Financial and Corporate Personal Mention Construction News

Hearing on Philadelphia Bills

Pleas Made Before Legislative Committee at Harrisburg—Mr. Stotesbury States Case as Affecting Himself and Associates

Pleas were made at Harrisburg on May 22 for the enactment at this session of the Legislature of all bills affecting the Philadelphia transit situation. The hearing was before a joint meeting of the judiciary general committee of the Senate and House. Among those who attended were Mayor Smith, Transit Director Twining, Finance Committee Chairman Joseph Gaffney, and two hundred members of the United Business Men's Association.

The Philadelphia Rapid Transit Company requested another hearing at which its representatives could present their side of the case. No date has been set for this hearing. As the hearing progressed it became apparent that the legislators were opposed to further enlarging the powers of the Public Service Commission.

THREE BILLS UNDER CONSIDERATION

There were three bills under consideration at the hearing. They were the Hecht bill, which would give the city the power to take over the lines of the Philadelphia Rapid Transit Company by exercising its right of eminent domain, compensation to be fixed by the Public Service Commission; a constitutional amendment increasing the city's borrowing capacity so as to provide this compensation, and the Salus bill, which would provide through-routing of the city's lines on the Philadelphia Rapid Transit Company's lines and also empower the commission to fix the question of fares and transfers.

While the Senate was still in session during the morning, a letter from Ellis Ames Ballard, chief counsel for the Philadelphia Rapid Transit Company, requesting another hearing, was placed on the desk of Senator Daix, who presided at the hearing. The Senator was absent at the time, but when he returned and read the letter he was surprised, inasmuch as it had been understood that the company's representatives would be present on May 22 and voice their opposition. With the Legislature talking about adjourning on June 14 next, the supporters of the various measures lost virtually all hopes for the passage of the legislation at this session.

Dr. William Draper Lewis, appearing as legal adviser to the city administration, spoke for more than two hours in favor of all the bills. He was frequently interrupted, and at one time clashed with Senator Deidleman, of Dauphin County, regarding the practicability of passing legislation now that would impair the obligations of the city of Philadelphia and the Rapid Transit Company as embodied in the 1907 contract. Senator McNichol and Representative Beyer also interrupted him with questions as to how the proposed measure would affect the Public Service Commission and give it greater authority. The Senator said that the bills also delegated to the commission the authority to say what the people of Philadelphia could do and could not do in their own city. He contended that they practically usurped the authority placed in City Councils, the Mayor and other city officials. The Senator said further that if the bills were passed it was more than likely that there would be a long court proceeding.

Senator McNichol asked the Mayor whether in his judgment it was impossible to reach an operating agreement without passage of the bills.

"If you had asked me that before Mr. Stotesbury's statement of last Friday," replied the Mayor, "I would have said 'No.' In reply to that question now, I would say 'Yes.'"

Several representatives of the United Business Men's Association urged the importance of passage of the pending measures before adjournment is taken next month.

FIRST PUBLIC HEARING IN PHILADELPHIA

The statement by Mr. Stotesbury to which the Mayor referred at Harrisburg was made at the first of the public hearings in Philadelphia on the transit lease matter on May 18. At that hearing the company announced it would be willing to forego an arbitrary right to increase fares, should the city equip the high-speed lines. The company would assume the payment of fixed charges on equipment bonds, and refer fare increases to the Public Service Commission. The first speaker was A. Merritt Taylor, former director of city transit of Philadelphia. He read a long statement in which he defended the lease in every disputed point. He was before the committee more than two hours. Ellis Ames Ballard, counsel for the company, requested to be permitted to clear up some points made by Mr. Taylor about which he thought there might still be doubt. Mr. Stotesbury read his statement. He said that the company had made a most liberal proposition to the city. He could not see how it would aid in the solution of the present question to pass legislation which would put into the hands of any body of men, however wise and public spirited, power to destroy the company. The very existence of such legislation would tend to make it impossible for the company to perform its part of the joint service. Mr. Stotesbury informed the joint councilmanic committee that if the proposed contract could not be accepted by the city, and it was felt that another contract should be negotiated with the company that may take away from the company the 5 per cent guaranteed dividend, he and his associates would resign from the management. This would leave the new directors free to negotiate a contract on terms which the city could accept.

Apparent Deadlock in Providence

The many conferences held between officials of the Rhode Island Company, Providence, R. I., and the delegates from the carmen's union have so far been apparently without definite result. The present agreement expires on May 31, and the matter is believed to be in a deadlock. Two years ago a strike was called. It lasted only one day, however, as both sides to the controversy agreed to arbitration.

Because of the peculiar condition in which the Rhode Island Company now finds itself, it is generally believed that the company will refuse to grant any material increase in wages. It has already appealed to the State for financial relief, and at its request the Legislature has provided for an investigation committee, with power to increase fares if it deems such action warranted and just. In view of this situation, the officials of the company are believed to be averse to making any agreement raising wages, although they have frequently admitted that the men should have more pay. The General Assembly is not in session and under ordinary circumstances cannot meet until January without special call from the Governor.

It is understood that the men are not anxious to have the matter go to arbitration again. The proceedings two years ago were very expensive to both sides. In addition to the expense, the arbitration proceedings were extended over a period of four or five months. There is no State arbitration board or official empowered to act in the emergency in working toward a settlement of the conditions. At the conferences President A. E. Potter, Superintendent R. R. Anderson and Attorney Whipple have represented the company.

Washington Strike Inquiry

Men Present Their Side—Company Now Engaged in Presenting Its Case

The Washington Railway & Electric Company, Washington, D. C., began on May 21 the presentation of its side of the case before the Senate committee which is inquiring into the recent strike of the employees of the company. The company called as the first witness George A. Wilburt, president of the Washington branch of the Amalgamated Association. Counsel established, through Mr. Wilburt's testimony, that District Commissioner Newman had been advised that the railway employees would not insist upon their demands for the closed shop and recognition of the union, provided other demands satisfactory to the men were allowed. Counsel also brought out that Mr. Wilburt had not availed himself of the opportunity for a final conference with President King of the company, because that conference was to have dealt only with the individual contracts proposed by the company. Counsel of the company then sought to show that the by-laws of the parent association were not lived up to in the letter of the law in the preliminaries to calling the strike.

UNION PRESIDENT'S TESTIMONY

It was developed by the testimony that President King of the Washington Railway & Electric Company would not deal with any committee of the Amalgamated, but would treat only with a committee of the men not representing that organization. Counsel questioned the witness to try to bring out that Mr. King would have been glad to receive the grievance committee of the men, but the witness clung to the statement that Mr. King wanted to talk about the individual contract, which, in the opinion of the witness, was of a character that made discussion of it useless, from the viewpoint of the union men. Later Mr. Wilburt admitted that he had said publicly that the conferences were over because Mr. King had refused to recognize the union. Subsequently he said that while the men wanted the union recognized, and favored the closed shop, still they would not cause a strike on refusal of these demands alone, provided other concessions were made, but that Mr. King would not discuss these matters. Mr. Wilburt's authority for this statement was questioned by counsel for the company. He did not understand that the Amalgamated was committed irrevocably to the principle of the closed shop. Senator Johnson pointed out that the contract of the Amalgamated with the Capital Traction Company demonstrated that fact. Mr. Wilburt also reviewed his career with the company since the date of his employment in 1908.

The committee resumed its session on the night of May 22. It will not sit while the Senate is in session.

THE MEN'S SIDE

In presenting their side of the case the men sought to show that the company had since the strike re-employed forty-eight men discharged previously from its service. The men also introduced what purported to be a statement of the terms under which new men were engaged at the outset of the strike to replace the men who went out.

Commissioner Oliver P. Newman, of the District, testifying before the committee on May 10, said that before the employees went on strike last March the commissioners were authorized by them to waive, in the proposed negotiations or mediation between the company and the men, the recognition of the union. Mr. Newman also told the committee that the commissioners did not state this fact to the officials of the company. Explaining the reasons of the commissioners for not making the direct statement that the men were ready to waive the demand for recognition of the union in the negotiations, Mr. Newman said: "The men wanted recognition, and asked us not to tip their hand to the company."

Mr. Wilburt, on the other hand, insisted that President King would not have agreed to mediation even if Commissioner Newman had told him the men were ready to waive recognition in the negotiations. As stated previously, his authority for this statement was questioned by counsel for the company.

St. Paul to Rush Electrification

The Chicago, Milwaukee & St. Paul Railway plans to complete the electrification of its line from Cle Elum, Wash., west, one year earlier than expected. The Puget Sound Traction, Light & Power Company has been advised by the St. Paul that it will be expected to furnish electric current from its hydroelectric and steam plants by Sept. 1, 1918. Survey crews and materials have been moved from Othello to South Cle Elum, and preliminary work will be started immediately, thus postponing work on the Columbia division. The reason for the change in plans, according to C. A. Goodnow, who is supervising the work, is the constantly increasing price of oil. The company must use oil in the locomotives passing through the forest reserves in the mountain on the Columbia division, while coal-burners can be employed between South Cle Elum and Othello without danger. The survey along the proposed line of the Columbia division has been almost completed, and setting of pole lines and building of substations is to start soon.

The contract of the Chicago, Milwaukee & St. Paul Railway with the Puget Sound Traction, Light & Power Company calls for a minimum of 13,000 hp., or the equivalent of one unit at the White River plant. The company has been working on plans for an increase in the capacity of the White River station, where two new units will be ready next spring, giving 23,000 hp. additional, and it is probable that an extra order for development at White River will be placed in time to permit the work to be completed before the St. Paul's western division is electrified. The present contract with the railroad calls for the delivery of current by the traction company at the Snoqualmie Falls plant.

CAPACITY USE OF STEAM PLANTS CONTEMPLATED

While the four steam plants of the Puget Sound Traction, Light & Power Company were used comparatively little during the past winter, orders have been placed to get all four ready for capacity use next winter, indicating the company's estimate of the immediate development of business within its territory. Its steam plants are located at Everett, Tacoma, and at Georgetown and Post Streets, Seattle. The present capacity of the company's water-power plants is as follows: White River, 33,000 hp.; Electron, 25,000 hp., and Snoqualmie, 25,000 hp.

The Chicago, Milwaukee & St. Paul Railway will expend $6,000,000 in making the change from coal to electricity between Othello and the coast. It will have 640 miles of track electrically operated.

The company has recently awarded to the Brick & Tile Delivery Company, Seattle, a contract for 3,000,000 bricks to be used in connection with the construction of substations every 30 miles along the line.

Hydroelectric Power Helpful

That hydroelectric energy is proving a substantial help in the solution of the fuel problem in street railway power plants was stated by C. V. Wood, president of the Springfield Street Railway, at a hearing on May 3 before the Massachusetts Waterways Board. The commission was considering a petition of the Turners Falls Power & Electric Company for authority to build an additional 66,000-volt line across the Connecticut River at Springfield for the supply of electricity to the Springfield Street Railway according to the terms of a contract recently closed between the two concerns. Mr. Wood said that delays in fuel supply last winter had several times brought the road within twelve hours of a shut-down. It is hoped that by 1919 all the energy required by the road will be supplied from the Turners Falls system, which will shortly be increased in capacity by the construction of a $2,000,000 auxiliary steam turbine plant at Chicopee Junction, Mass. The Springfield Street Railway would be obliged to expend $1,500,000 if it enlarged its power plant facilities itself. Bentley W. Warren, counsel for the Massachusetts Street Railway Association, also spoke on behalf of the purchase of power by street railways. He then emphasized the present difficulties in obtaining capital for electric railway power plant extensions.

Bridge Negotiations Continue

City of Seattle and Puget Sound Company Still Conferring Over Bridge Contract

Negotiations between the city of Seattle, Wash., and the Puget Sound Traction, Light & Power Company, relating to the use of the Fremont bridge by the company, came to a deadlock when Councilman Erickson, chairman of the Council committee of three in charge of the negotiations, announced that no proposition would be considered for the use of the bridge by the company that did not carry with it the right of the city to operate its cars over the Third Avenue tracks of the company. A. W. Leonard, president of the company, declared that the company had a franchise right to operate over the Fremont Avenue bridge, whereas the city was asking something for which it had no legal right. He insisted that the two questions were distinct, and should be considered separately.

CITY SUGGESTS YEARLY RENTAL

A. H. Dimock, city engineer, and A. L. Valentine, superintendent of utilities for the city, submitted a report suggesting that a yearly rental of $7,568 plus one-third the cost of operation and maintenance be charged the company for the use of the bridge. The company's engineer refused to concur in this finding. Mr. Leonard said that the company stood ready to pay a fair cash rental, but Councilman Erickson insisted that a cash rental would not be considered unless the company would fix a rate for the operation of city-owned cars over the tracks of the company. Mr. Leonard intimated that the company would not agree to the use of its tracks for city cars, but would be willing to take over both Division A and the Lake Burien branch of the municipal railway, and operate them in connection with the company's system.

Mayor Gill said that he was disposed to favor an arrangement whereby the company would take over the Nickerson Street line from the city, provided the company extended it to Ballard. He said that the matter should not involve the exchange of transfers or any other issue. The important thing was to provide service for the 50,000 patrons living north of the bridge.

The City Council later passed a resolution requesting the Mayor and the Board of Public Works to prohibit the company from operating over the Fremont bridge.

BRIDGE TO OPEN JULY 1

The bridge will probably not be opened for traffic until July 1. In the meantime, conferences between officials of the company and the city committee will continue, looking toward an adjustment of the several matters in hand. The importance of the bridge as a link between the north and south ends of Seattle as divided by the Lake Washington canal, is shown by reports of A. L. Valentine, superintendent of utilities, indicating that 1275 cars will operate over that structure every twenty-four hours, when the Stone Avenue bridge is removed, making a total of 465,375 cars a year.

Atlanta Fire Damage

Loss of More Than $75,000 Sustained by the Georgia Railway & Power Company—Lighting and Railway Service Restored Quickly

Seven electric railway lines of the Georgia Railway & Power Company, Atlanta, Ga., serving the entire northeastern quarter of the city, were put temporarily out of commission by the great fire that swept Atlanta on May 21. The damage sustained by the company is estimated at more than $75,000. This figure represents $25,000 injury done to the railway department and $50,000 to the lighting and commercial and the arc circuits. Throughout the burned area, which comprised more than seventy city blocks, poles and wires and transformers and insulators were reduced to charcoal and junk. In addition to these positive losses, the radical and sudden reduction of receipts from the residence sections that the flames reduced to a stark wilderness was considered a further item of injury to be charged to the fire. Notwithstanding these losses, the Georgia Railway & Power Company headed the list of subscribers to the city's relief fund with a gift of $2,500.

Immediately after it became apparent that the fire was beyond the control of the local firemen, plans for localizing its effects were applied by the company, with the result that trolley and other electric services continued normal and without interruption in all other parts of the city. Just as soon, however, as the local fire department and the assisting fire fighters rushed to Atlanta by special trains mastered the flames, the company began its work of restoring service into and beyond the desolated area. Within less than twenty-four hours after the fire reached its height, lighting circuits and arc circuits were alive once more and the first of the interrupted trolley lines had resumed service much further toward its terminus.

SERVICE CUT OFF TEMPORARILY FROM BURNED AREA

In consequence of the fact that several railway lines crossed the burned area or lay largely within it a very much larger section of the city than was burned was deprived temporarily of all street railway service. Restoration of car service entailed practically the complete rebuilding of everything except the tracks. Ten cars were trapped by the flames, but were rushed out of the danger zone and parked at points of comparative safety beyond the fire to await the time when they could proceed with their own motors again.

The operation of each of the railway lines in the fire area was continued until in sequence one after the other was stopped by the flames. Numerous instances were reported of residents throwing their valuables into or upon outgoing cars in order to save them from the rapid advance of the fire.

For a time two large carhouses of the Georgia Railway & Power Company were threatened. They were on the western edge of the fire's wide path. The company suffered a $2,000 loss in the burning of a shed occupied by roadway men and work cars. The company's car-building and repairing plant on Tenth Street was just beyond the northeastern extremity of the fire's reach and for several hours was in danger from sparks. It was expected on May 22 that all damage sustained by the company would be repaired by May 26.

Seattle Settlement Terms Filed

All Litigation with Seattle & Rainier Valley Railway Settled Except One Suit

Nine acceptances on the part of the Seattle & Rainier Valley Railway, Seattle, Wash., necessary to complete the settlement of all differences between the company and the city of Seattle, were filed recently. They were signed by Marshall E. Sampsell, president, and Walter M. Brown, secretary and manager of the company. By the provision of the various ordinances and the acceptances by the company of their terms, all litigation between the company and city is dismissed with the exception of the suit brought by the city to recover 2 per cent of the gross earnings of the property during the period that the line was operated without a franchise. Some of the provisions of the ordinances are as follows: Exchange of transfers between the Rainier and city lines, common-user rights to the city on Fourth Avenue, between Stewart and Jefferson Streets; company to extend its lines on Genesee Street, abandon its line on Stewart Street between Fourth and Fifth Avenues, and build a turning track on Fourth Avenue north of Stewart Street; service on Dearborn Street, abandoned when regrade was taken up several years ago, to be resumed; cars to be operated from Seattle Boulevard to Dearborn and on Fourth Avenue from Washington Street to Seattle Boulevard on the tracks of the Puget Sound Traction, Light & Power Company, and tracks on Washington Street between Fourth and Thirteenth Avenue South to be abandoned.

A judgment of $41,700, awarded by the United States Court in favor of the company and against the city for private right-of-way taken and changing of grades of Rainier Avenue, will be satisfied by the city as part of the general settlement agreement.

Senate Passes Bill to Increase I. C. C.—The Senate has passed the bill increasing the membership of the Interstate Commerce Commission from seven to nine.

Meetings in Springfield Carhouse.—The Springfield, (Mass.) Street Railway on Monday, May 21, entertained the Board of Trade of that city at a noon-day luncheon at its new carhouse. On Tuesday the Mayor and the members of the City Council paid a visit of inspection to the building. The Rotary Club of Springfield was invited to hold a meeting in the carhouse on Friday, May 25.

Strike at Alliance Reported Settled.—The indications on the afternoon of May 22 were that the strike of motormen and conductors on the Stark Electric Railroad and the Cleveland, Alliance & Mahoning Valley Railroad would be settled. It is stated unofficially that the company has agreed to recognize the union, increase wages 5 cents an hour and reinstate four or five men who had been discharged.

Bonus to Meet High Cost of Living.—The Omaha & Council Bluffs Street Railway, Omaha, Neb., has announced it will pay to 1200 employees earning $100 a month or less a "high cost of living bonus" of 6 per cent of wages earned from Jan. 1 to July 1, 1917. The bonus will be paid on July 15 to employees in the service of the company the entire six months, with the exception of men in the power department, whose wages recently were readjusted. The company estimates that the bonus will amount to $25,000.

Wage Increase in Guelph.—On May 15 the employees of the Guelph (Ont.) Municipal Street Railway were informed that their wages would be increased to 25 cents an hour for a sixty-eight-hour week. The men had asked for 30 cents an hour to correspond with other civic employees. The municipality pointed out that the other employees did not receive full time. This is the fourth increase which has been made in the wages of the men during the last twelve months. A year ago the men were receiving 21 cents an hour.

Village Wants to Negotiate After Road Is Built Around It.—The Village Council at Berea, Ohio, has instructed City Solicitor S. W. Green to negotiate with the Cleveland, Southwestern & Columbus Railway in an effort to settle the question of operation of cars through the town, and has agreed to ratify any arrangement he may make, provided it is subject to a referendum vote. The company has recently completed tracks around the town. The trouble between the village and the company arose over the fare between Berea and Cleveland.

Dallas Ordinances to Be Contested.—Dallas traction interests will contest in the courts the recent municipal election at which three ordinances initiated by the Socialists were adopted, according to Edward T. Moore, vice-president and general manager of the Dallas Consolidated Electric Street Railway. These three ordinances are the jitney ordinance, initiated by the Jitney Drivers' Association; the ordinance requiring an eight-hour day for corporation employees, including employees of street railways, and the ordinance requiring safety appliances on street cars.

Differences Settled in Albany.—The differences between the trainmen and the officials of the United Traction Company, Albany, N. Y., over the interpretation of certain sections of the working agreement pertaining to the operation of extra cars have been satisfactorily adjusted, as a result of several conferences between the officials of the company and representatives of the men. A settlement was finally reached by both sides adopting a set of station rules and regulations embodying the rights of the company in the use of its extra men.

McAlester Adjustment for Two Years.—The agreement entered into between the Pittsburg County Railway, McAlester, Okla., and its employees, to which reference was made in the ELECTRIC RAILWAY JOURNAL of May 19, will govern the hours of duty and the scale of wages for a period of two years, dating from May 1. As stated previously the matter was adjusted on the basis of the payment of an average increase of 3 cents an hour to all classes of employees represented. The men demanded 4 cents an hour advance, while the company announced its willingness some time ago to grant an increase of 2 cents.

Park Amusements Destroyed.—Thirteen amusement places at Woodside Park, Philadelphia, Pa., were destroyed by fire on May 20. The amusement attractions were owned by the concessionaries and the loss to them is estimated unofficially at $160,000, covered largely by insurance. The park itself is owned and controlled by the Fairmount Park Transportation Company. The park is on the edge of famous Fairmount Park and is one of the city's most popular resorts. It was opened for the summer on May 5. The amusements which were not damaged will be continued in operation and the ones that were destroyed will be rebuilt or replaced.

Conferences Proposed on East Cleveland Franchise.—Officers of the Cleveland (Ohio) Railway have announced that conferences will be held shortly with city officials of East Cleveland in an endeavor to settle several small differences which have arisen since the tentative agreement was reached some time ago. The Council has not yet acted upon the franchise and there may be some hesitancy, since the city of Cleveland, which has control of the service on the Cleveland Railway, has refused to improve the service between Lakewood and the city, although the fare is 5 cents. Officials of the latter suburb asked that the cars running to it be marked "Lakewood—Fare 5 Cents," in order that the Lakewood cars may not be overcrowded with passengers who do not ride to the suburb. Half of the cars run on the Lakewood route are turned back at the city limits.

Shortage of Labor in Buffalo.—Unable to get sufficient men to operate its cars, the International Railway, Buffalo, N. Y., has been forced to withdraw a number of runs. Every effort is being made to secure platform men. Large display advertisements are being used not only in Buffalo but in Niagara Falls, Lockport and other western New York cities. Many employees have resigned to accept positions at higher pay in steel mills and other industries, while others have joined the military forces. Owing to the labor situation, the company has been forced to secure women to clean cars in several of the carhouses. The women receive the same pay as the men. A very large percentage of the company's employees is subject to the selective draft. The company has made no announcement as to whether it will try women as fare collectors.

Service of I. U. T. Normal Again.—Officials of the Union Traction Company of Indiana report that there is now no interruption to the normal service on all the interurban and city lines of the company due to the walkout of about thirty-six interurban trainmen when a strike was called by the Brotherhood of Locomotive Engineers and Order of Conductors on May 13. Vernon Hinkle, deputy president of the Order of Railway Conductors, made public a statement on May 19 setting forth the claims of the brotherhoods and the arrangements made in Muncie, Anderson, Marion, Tipton and other cities for parades and demonstrations for the purpose of bringing their case before the other employees of the Union Traction Company. He asserts that the service of the company is crippled and that "the fight on the property will continue until all of the men working are taken out on strike."

Settlement of M. C. B. Exhibit Arrangements.—Owing to the abandonment of this year's convention of the American Master Mechanics' Association and Master Car Builders' Association, the Railway Supply Manufacturers' Association had to terminate its contracts made at Atlantic City in anticipation of the convention. It did this by having these contracts carried over to 1918 on the same terms and prices, thus reducing the direct loss for the exhibition account to less than $700, instead of a possible $10,000 or $12,000. As some payments had to be made to the contractors on account of these suspended contracts, the executive committee will withhold 50 per cent of the amount paid for exhibit space in the 1917 convention and refund 50 per cent. The Atlantic City Hotel Men's Association, C. M. Koury & Company, furniture, and J. J. Habermehl's Sons, decorations, have also accepted the cancellation of each individual member's order. As under the constitution of the Railway Supply Manufacturers' Association all officers continue until their successors are elected and qualify, the officers and executive committee members of this year will carry over until next year.

Wage Increase Under Consideration in Chicago.—The demands of the employees of the Chicago (Ill.) Surface Lines and the Chicago Elevated Railways for increased wages, as outlined in the ELECTRIC RAILWAY JOURNAL for May 12, were formally presented to the surface lines on May 16 and to the elevated lines a few days in advance of this. The companies were expected to make answer about May 24. An ordinance was introduced in the City Council by J. C. Kennedy, a Socialist Alderman, on May 21, for the appointment by the Mayor of a board of examiners of three members, and that no one shall be permitted to act as a motorman or conductor without first obtaining a license from this board. A penalty clause is attached providing for a fine of from $10 to $200 for failure to obtain such a license, and this fine may be assessed against the company as well as the employees. The ordinance was referred to the judiciary committee of the Council.

Mediation Board to Try to Settle South Bend Strike.—Governor Goodrich of Indiana announced on May 19 that he will appoint a special mediation and conciliation board to attempt to settle the difference between the Chicago, South Bend & Northern Indiana Railway and those of its employees on the South Bend city lines who went out on strike on April 29. The new board will be appointed under the State voluntary arbitration law, and will be known as a "mediation and conciliation board," the company having recently refused to accept the appointment of an arbitration board. It rejected the idea of an arbitration board on the ground that it was operating all its lines; that the differences with its employees in other cities and on other divisions had been amicably settled, and that the trainmen who are out on strike had received an opportunity to return to work under the conditions accepted by their fellow employees, and had failed to take advantage of this offer. The Governor's action was taken after receipt of a letter from Mayor Keller of South Bend stating that he believed the differences could be settled by such a board.

Recess Inquiry Into Street Railway Problems in Massachusetts.—The committee on rules of the Massachusetts Legislature has reported a resolve in favor of an investigation of the economic condition of street railways in the State by a recess commission during the coming summer. In commenting editorially upon this, under the caption "Investigations Worth Making," the Boston *Transcript* said in part: "The suggestion is deserving of adoption. The State cannot rightly avoid taking a hand to attempt the solution of the street railway problem. Facing a steady reduction in revenue, as the costs of construction and operation steadily rise, the electric lines must find relief. Their only alternatives are curtailment of service, permission to increase their rates, reduction of taxes and the grant of similar special concessions, or outright State ownership, which would have the probably unhappy result of throwing the burdens on the taxpayers. The public must prepare itself to determine which of these alternatives it will allow. We are in for a campaign of education concerning these matters of transportation, and the sooner we complete it the better."

Programs of Association Meetings

Central Electric Railway Association

In conformity with its pledge of full service to the government the Central Electric Railway Association has annulled its summer boat trip meeting scheduled for June 22 to 25 so that the members may devote their endeavors to the maintenance of high operating standards on their own properties.

Public Relations "Round Table"

J. C. Davidson of the Denver (Col.) Tramway is urging all publicity managers, public relations men, general managers and others directly connected with public relations work to attend the "Round Table" of their profession at the convention of the Associated Advertising Clubs of America at St. Louis, Mo., on June 3 to 7. The purpose of the "Round Table" is to exchange publicity and public relations methods and ideas with the object of increasing the efficiency of such work. No set program of papers has been arranged. The Hotel Jefferson will be the headquarters of the clubs. Delegates are requested to have facts, figures and examples of work with them. Additional information may be obtained by addressing Mr. Davidson at 807 Tramway Building, Denver, Col.

Financial and Corporate

Annual Reports

United Railways & Electric Company

The statement of income, profit and loss of the United Railways & Electric Company, Baltimore, Md., for the year ended Dec. 31, 1916, follows:

Operating revenues	$9.914,051
Operating expenses and taxes (including depreciation)	6.058,492
Operating income	$3,855,559
Non-operating income	92,000
Gross income	$3,947,559
Deductions from gross income:	
Rents	$410,088
Interest on funded debt	1,822,393
Interest on income bonds	559,080
Amortization of discount on funded debt	19,789
Miscellaneous	28,085
Total deductions	$2,839,435
Net income	$1,108,124
Profit and loss credits	105,967
Gross profit and loss surplus for year	$1,214,091
Profit and loss debits:	
Dividends on common stock	$818,448
Dividends on preferred stock	920
Miscellaneous appropriations of surplus	178,710
Miscellaneous debits	112,578
Total debits	$1,110,656
Undistributed profit for year	$103,435
Profit and loss surplus at Dec. 31, 1915	1,008,058
Total profit and loss surplus	$1,111,493

Effective Jan. 1, 1916, the company adopted the revised classification of accounts prescribed by the Public Service Commission of Maryland, and the figures displayed above are in accordance therewith. Under this classification depreciation is charged as an operating expense. Following are the results for 1916 compared with those for 1915, the figures for the latter year having been revised:

	1915	1916	Increase	Per Cent Increase
Operating revenues	$8,980,710	$9,914,051	$933,341	10.39
Operating expenses	4,102,766	4,567,949	465,183	11.34
Depreciation	410,548	495,702	85,154	20.74
	$4,513,314	$5,063,652	$550,338	12.19
Taxes, licenses, etc	904,675	994,840	90,165	9.97
	$5,417,989	$6,058,492	$640,503	11.82
Ratio of operating expenses to operating revenues:				
	Per Cent	Per Cent		
Operating expenses	45.68	46.08	......	0.40
Depreciation	4.58	5.00	......	0.42
	50.26	51.08	......	0.82

After paying all expenses and charges of every character, and after crediting the usual amount to regular reserve accounts, the company in 1916 earned $288,755 more than the amount required for the 4 per cent dividend on the common stock. Of this sum $157,500, representing the company's total investment on account of the "jitney" companies, was set aside as a reserve. There remained, after further adjustments, the sum of $103,435, which was entered to "undistributed profit."

The increases in gross and net over 1915 were considerably above normal. The year 1915 was a relatively poor one for the company. There were two main causes—depressed industrial conditions existing during the greater part of that year which affected Baltimore as well as other cities, and the unregulated jitney competition prevailing during a greater part of the year. The situation after that time materially changed. Beginning with the fall of 1915 there was a revival of activity and the city entered upon a period of rapid and substantial industrial development. Within the last year and a half it is estimated that there was expended or provision was made for the expenditure of sums aggregating more than $125,000,000 around the port of Baltimore for the establishment of new industries or for the expansion of existing industries.

To solve the jitney problem the railway invested in the stock of two separate companies, one operating jitneys and the other a bus line on one of the principal thoroughfares not provided with direct car service. The experience of the railway with this means of transportation was identical with that of others in the same field, and it has been demonstrated conclusively that, under existing conditions, these lines cannot be operated with profit at a 5-cent fare. The jitney company, therefore, has practically ceased operation, but the bus line has been continued for the convenience of the public.

The railway's total investment in the stocks of these companies and its contingent liability as indorser of the notes of the two companies amounts to $157,500. This whole sum, as before stated, was set up as a reserve against earnings for 1916. The total cost of this venture, therefore, can be charged off against income for 1916. At the present time there are but few jitneys in operation in Baltimore.

For maintenance of way, structures and equipment, there was charged to operating expenses during 1916 $834,116, which with the $495,703 credited to depreciation reserve and included in operating expenses, makes a total of $1,329,819, an increase of $199,992. The total taxes and public charges in 1916 paid by the company were $1,158,590. This represents the total net earnings (after paying costs of operation only) of one car in every four. It also represents 11.69 per cent of the gross revenues.

Petaluma & Santa Rosa Railway

The gross earnings of the Petaluma & Santa Rosa Railway, Petaluma, Cal., for the calendar year 1916 amounted to $273,534, as compared to $283,047 the year before, while the operating expenses dropped from $201,151 in 1915 to $185,950 in 1916, so that the net earnings rose from $81,897 to $87,583. Moreover, the fixed charges showed a slight decrease from $62,363 in 1915 to $61,602 in 1916, with the result that the surplus gained from $19,534 in 1915 to $25,981 in 1916.

The passenger earnings decreased $8,692 during 1916, as compared to more than $10,000 in 1915. Up to 1915 the passenger earnings had shown a consistent increase. The principal cause of the decrease thereafter was the increase in the use of automobiles. Business conditions in 1916 were better in the company's territory, and the prices prevailing were high enough to offset a shortage in production, but the decrease in the production of many commodities made a corresponding decrease in tonnage for the railway. Moreover, both steamers of the company were tied up between June 1 and July 20, at the busiest time of the year, on account of a general strike of steamboat firemen and deck hands. While the entire decrease of $9,513 in gross earnings was probably attributable to the strike, the company suffered practically no net loss on account of it. Considerable business, however, was lost through the closing of the Panama Canal, inasmuch as the traffic moved via routes which eliminated the company from enjoying any part of the haul.

Considerable was accomplished during the year in reducing the cost of operation through a close attention to details and the development of greater efficiency. The net reduction in operating expenses amounted to $15,200, even after the inclusion of $10,934 on account of depreciation and compensation insurance, for which no charge was made prior to the last year. About $8,500 of the reduction was caused by the elimination of the expense of operating the steamers during the strike. Moreover, by a consolidation of the duties of president and attorney, and general manager and traffic manager, the salaries of general officers were reduced $2,300. More can perhaps be done along the line of economical efficiency, it is said, but a substantial increase in revenue is needed. The company will apply, as soon as it is possible to secure the necessary co-operation, for increases in rates which, it is believed, can be made without injuriously affecting its business and which will increase the revenue $20,000 or $30,000 a year.

Electric Railway Statistics

Expenses Shown to Be Increasing Faster Than Revenues, in Comparison of Returns for February, 1917, with Those for 1916

A comparison of electric railway statistics for February, 1917, with figures for the corresponding month of 1916, made by the information bureau of the American Electric Railway Association, indicates that the expenses of electric railways in the United States are increasing faster than the revenues. This condition is particularly noticeable in the East and has had a depressing effect upon the returns for the country as a whole. Data for February, representing 9123 miles of line of companies scattered throughout the country, figured on the per mile of line basis, indicate an increase in operating revenues of 3.18 per cent, in operating expenses of 8.95 per cent and a decrease in net earnings of 6.99 per cent. Data representing 7324 miles of line indicate an increase in the amount of taxes paid of 8.40 per cent and a decrease in operating income of 15.83 per cent. The returns from the city and interurban electric railways, as shown in detail in the appended table, have been classified according to the following geographical grouping: Eastern District—East of the Mississippi River and north of the Ohio River. Southern District—South of the Ohio River and east of the Mississippi River. Western District—West of the Mississippi River.

Of the three groups shown in the accompanying table, re-

REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR FEBRUARY, 1917

Account	UNITED STATES				EASTERN DISTRICT				SOUTHERN DISTRICT				WESTERN DISTRICT			
	Amount, February, 1917	Per Mile of Line			Amount, February, 1917	Per Mile of Line			Amount, February, 1917	Per Mile of Line			Amount, February, 1917	Per Mile of Line		
		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase
Operating revenues	$17,478,709	$1,916	$1,857	3.18	$13,231,774	$2,096	$2,025	3.51	$1,237,286	$1,155	$1,130	2.21	$3,009,649	$1,732	$1,700	1.88
Operating expenses	11,767,872	1,290	1,184	8.95	9,027,325	1,430	1,288	11.02	725,178	677	660	2.57	2,015,369	1,159	1,130	2.56
Net earnings	5,710,837	626	673	†*6.99*	4,204,449	666	737	†*9.64*	512,108	478	470	1.70	994,280	573	570	0.52
Operating ratio, per cent	1917, 67.32; 1916, 63.76				1917, 68.22; 1916, 63.60				1917, 58.61; 1916, 58.40				1917, 66.91; 1916, 66.47			
Average number of miles of line represented	1917, 9,123; 1916, 9,018				1917, 6,314; 1916, 6,236				1917, 1,071; 1916, 1,067				1917, 1,738; 1916, 1,715			

COMPANIES REPORTING TAXES

Account	UNITED STATES				EASTERN DISTRICT				SOUTHERN DISTRICT				WESTERN DISTRICT			
Operating revenues	$13,177,857	$1,799	$1,776	1.29	$9,557,406	$1,878	$1,858	1.07	$719,237	$1,163	$1,136	2.37	$2,901,214	$1,793	$1,767	1.47
Operating expenses	9,192,46	81,255	1,164	7.81	6,851,589	1,346	1,227	9.69	405,425	656	636	3.14	1,935,454	1,196	1,170	2.22
Net earnings	3,985,389	544	612	†*11.12*	2,705,817	532	631	†*15.69*	313,812	507	500	1.40	965,760	597	597	0.00
Taxes	944,088	129	119	8.40	696,170	137	123	11.38	60,929	99	95	4.21	186,989	115	118	†*2.55*
Operating income	3,041,301	415	493	†*15.83*	2,009,647	395	508	†*22.25*	252,883	408	405	0.74	778,771	482	479	0.62
Operating ratio, per cent	1917, 69.76; 1916, 65.54				1917, 71.67; 1916, 66.04				1917, 56.40; 1916, 55.98				1917, 66.70; 1916, 66.21			
Average number of miles of line represented	1917, 7,324; 1916, 7,222				1917, 5,088; 1916, 5,009				1917, 618; 1916, 617				1917, 1,618; 1916, 1,596			

†Decrease. There were twenty-nine days in February, 1916, and only twenty-eight days in February, 1917.

turns for the Eastern representing 6314 miles of line are somewhat affected by the unsatisfactory conditions which have had to be faced by the electric railways operating within the limits of Greater New York. These railways have not only suffered a slight decrease in revenues but have had to meet a considerable increase in their operating expenses and taxes. Consequently, though conditions in other parts of the district were slightly better, the returns for the district as a whole indicate an increase in operating revenues of 3.51 per cent, in operating expenses of 11.02 per cent and a decrease in net earnings of 9.64 per cent. Returns representing approximately 80 per cent of the above mileage show an increase in the amount of taxes paid of 11.38 per cent and a decrease in operating income of 22.25 per cent. Returns for the Southern group representing 1071 miles of line and for the Western group representing 1738 miles of line, though showing a greater percentage increase in operating expenses than in operating revenues, still indicate a slight increase in net earnings. Companies in the Southern group represented by 618 miles of line indicate an increase in the amount of taxes paid of 4.21 per cent and in operating income one of 0.74 per cent. In the Western group the operating income increased 0.62 per cent.

The operating ratio for the country as a whole has increased from 63.76 in February, 1916, to 67.32 in 1917. The increase is due largely to the increase in the operating ratio of the Eastern district. Slight increases in the operating ratio of the Southern and Western districts have also occurred.

R., S. & E. Reorganization Plan

Committee Representing Bondholders of the Rochester, Syracuse & Eastern Railroad Announces Plan and Agreement of Reorganization

The bondholders' protective committee, of which Arthur W. Loasby is chairman, representing the Rochester, Syracuse & Eastern Railroad bondholders, has submitted to the holders of the first mortgage 5 per cent gold bonds of that company who have deposited their bonds a plan for the purchase of the property at foreclosure and for its reorganization. The plan and agreement for the reorganization are dated May 18. It is expected that a sale of the property under the judgment of the Supreme Court will be held in the near future in the action commenced at the request of the committee.

The committee says that the property as a whole is in good condition to be taken over and operated by the bondholders without the rehabilitation expenditures which frequently form a part of reorganization plans. As to what the bondholders may expect in net earnings, if the plan is carried out, the committee says that the property has had the benefit of a full year's operation under the management of C. Loomis Allen, the receiver, and that if the bondholders approve the plan submitted by the committee, Mr. Allen will be continued in the management of the property by the new corporation. The statement of the financial operations of the company for the year ended Dec. 31, 1916, shows gross earnings of $753,343 and the amount applicable to the payment of bond interest and dividends $218,604.

The committee has concluded that the property should be acquired and operated by the bondholders through a new company, and that the capitalization authorized for the purpose of acquiring the property should not exceed its actual value, $7,000,000, as follows: $3,000,000 of 6 per cent cumulative preferred stock, $1,000,000 of common stock and $3,000,000 of first mortgage 5 per cent bonds. The bondholders who participate in the plan will receive for each $1,000 par value of the old bonds securities of the new company as follows: $500 of first mortgage 5 per cent bonds, $500 of 6 per cent cumulative preferred stock, $200 of common stock and $100 additional of 6 per cent cumulative preferred stock representing unpaid interest.

The amount of the old bonds outstanding was $4,896,000. If the holders of all of these bonds participate in the new plan the total amount of securities of the new company outstanding will be $2,448,000 of bonds, $2,937,600 of preferred stock and $979,200 of common stock, or a total of $6,346,800. The plan further provides that such of the authorized securities of the new company not required for delivery to participating bondholders shall be delivered to the committee to be used by it to raise the necessary cash to pay the non-participating holders. The amount of the bonds which will be issued by the new company will be not less than $2,448,000 and not more than $3,000,000.

It is pointed out that the net earnings of the company during the first year of its operation will probably exceed the amount required for interest upon the bonds by from $70,000 to $100,000, which will be applicable to dividends upon the preferred stock. The committee says that it is expected that there will ultimately be available to the participating certificate holders approximately $500,000 in possession of the Columbia Trust Company, the trustee of the mortgage, and of Mr. Allen and Mr. Holden, the receivers of the company. The committee reserves its decision as to how it shall apply this money, but points out that the fewer the dissents from the plan of reorganization the more likely it becomes that this money or some part of it may be devoted to paying the interest in default or some part of such interest. No assessment of cash is to be made upon the bondholders for the organization of the new company or the operation of the property.

Cumberland County Power & Light Company, Portland, Maine.—The Cumberland County Power & Light Company has applied to the Maine Public Service Commission for authority to issue $440,000 of bonds of which $207,700 are to be used for improvements during 1917. The commission has authorized the Portland Railroad, controlled by the Cumberland County Power & Light Company to issue $297,000 of first lien and consolidated mortgage bonds, making $2,147,000 outstanding.

Havana Electric Railway, Light & Power Company, Havana, Cuba.—The stockholders of the Havana Electric Railway, Light & Power Company have approved the plan to increase the preferred capitalization from $15,000,000 to $21,000,000. The holders of common and preferred stock of record of March 28 have the privilege to subscribe to the new stock, on the basis of 20 per cent of their holdings, at par and an amount equivalent to the accruing dividend thereon to June 15, making a total of $101.25 per share for the new preferred. Payments for the stock must be made on or before June 15.

International Railway, Buffalo, N. Y.—The New York Public Service Commission for the Second District has authorized the issue by the International Railway of $1,500,000 of the company's refunding and improvement 5 per cent bonds. The proceeds will be used to finance the extensions and improvements to the company's lines and additions to its rolling stock during the year 1917 and to refund $25,000 of car trust certificates due this year. Most of the projects provided for in the company's schedules have already been made public. They include the purchase of fifty-five new cars, improvement to the equipment of present cars, track reconstructions and extensions and additions to the power house and substation equipment.

Lehigh Valley Transit Company, Allentown, Pa.—The agreement seeking the deposit of the stock of the Lehigh Valley Transit Company in connection with the deal involving consolidation with the Lehigh Navigation Electric Company has been extended for ninety days from May 7. On May 12, $3,385,250 of preferred stock and $2,288,000 of common stock deposit receipts had been listed on the Philadelphia Stock Exchange.

Los Angeles (Cal.) Railway.—The operating revenues of the Los Angeles Railway for the year ended June 30, 1916, totaled $6,101,792, and the operating expenses $4,136,660. The revenue per car-mile for this year was 20.71 cents, and the operating expenses per car-mile 14.01 cents. The revenue per mile of track totaled $16,671.

New York (N. Y.) Railways.—The holders of bonds aggregating $2,000,000 of the former Twenty-eighth & Twenty-ninth Streets Crosstown Railway cannot sue the New York Railways in the New York federal courts, according to a decision handed down in the Supreme Court of the United States. The bonds were guaranteed by the Metropolitan Street Railway. After the Metropolitan Street Railway became insolvent, suit was brought in the United States District Court at New York for the recovery of the principal of the bonds, the complainants contending that the New York Railways was liable therefor. The District Court refused so to hold, questioning its jurisdiction in the matter. The case was carried to the United States Supreme Court, and the decision of the lower court affirmed. The Third Avenue Railway is now operating the Twenty-eighth & Twenty-ninth Streets Railway, which has been reorganized as the Mid-Crosstown Railway. B. F. Wollman, president Bleecker Street & Fulton Ferry Railroad, has announced that the sale of the stock of that company to the New York Railways has been consummated and that more than 85 per cent of the stock has been delivered. The purchase of the stock of the New York Railways was made with the approval of the Public Service Commission for the First District at $28.50 a share.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—The Oakland, Antioch & Eastern Railway has filed with the California Railroad Commission an application for authority to renew promissory notes for a total of $400,000. Of these notes, $240,000 are to the Union Trust Company, San Francisco, Cal., and draw interest at 6 per cent; $19,053 are to the J. G. White Engineering Corporation, and bear interest at 6 per cent; $47,800 are to the United States Steel Products Company, and are 6 per cent notes; and $93,000 are to the Anglo-London-Paris National Bank, and bear the interest rate of 7 per cent.

Syracuse & Northern Electric Railway, Syracuse, N. Y.—The New York Public Service Commission for the Second District has approved of the reorganization of the Syracuse & South Bay Electric Railroad and the Syracuse, Watertown & St. Lawrence River Railroad as the Syracuse & Northern Electric Railway, in accordance with an agreement reached with a committee of the bondholders composed of F. W. Roebling, Jr., W. L. Smith and William Nottingham. The new company has been authorized to issue $40,000 of first lien notes, $153,750 of second mortgage bonds, $480,000 of first preferred 6 per cent non-cumulative stock, $420,000 of second preferred 6 per cent non-cumulative stock and $150,000 of common stock. This makes the total capital liabilities $1,243,750, as against $1,790,000 of securities of the two old companies. The committee on reorganization says in its petition that the new arrangement will reduce the fixed charges on the property to a point where its undoubted value in construction, equipment and territory will enable the new company to live.

Tidewater Power Company, Wilmington, N. C.—Hugh MacRae, president of the Tidewater Power Company, has written to the ELECTRIC RAILWAY JOURNAL relative to the proposed sale of the property of the company to Brooks & Company, Scranton, Pa., to the effect that for reasons mutually satisfactory the transaction was not consummated.

Trans-St. Mary's Traction Company, Sault Ste. Marie, Mich.—A receiver has been appointed for the Trans-St. Mary's Traction Company. The company defaulted in the payment of the interest due on Jan. 1 on its fifteen-year 5 per cent bonds as noted in the ELECTRIC RAILWAY JOURNAL of April 7, page 664.

Washington Railway & Electric Company, Washington, D. C.—In accordance with the approval received from the District of Columbia Public Utilities Commission for the issue of $1,127,000 of general improvement 6 per cent debenture bonds, the Potomac Electric Power Company offers for sale $750,000 of the bonds, and will receive subscriptions until noon May 31. The proceeds will be used for extensions, additions, betterments and improvements and to reimburse the company for previous expenditures. The bonds are guaranteed by the Washington Railway & Electric Company, which controls the Potomac Company.

West Virginia Traction & Electric Company, Wheeling, W. Va.—William P. Bonbright & Company, Inc., New York, N. Y., reported on May 17 that they had already sold more than $1,000,000 of the $1,800,000 of 6 per cent secured notes of the West Virginia Traction & Electric Company, underwritten by them, since making their private offering of these notes on May 1.

Dividends Declared

Baton Rouge (La.) Electric Company, 3 per cent, preferred; 4 per cent, common.

Cities Service Company, New York, N. Y., monthly, one-half of 1 per cent, common and preferred; one-half of 1 per cent common, payable in common stock.

Citizens Traction Company, Pittsburgh, Pa., $1.50.

Northern Texas Electric Company, Fort Worth, Tex., quarterly, 1 per cent, common.

Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis., quarterly, 1¾ per cent, preferred.

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar.,	'17	$71,203	*$40,566	$30,637	$18,646	$11,991
1 " "	'16	63,794	*35,896	27,898	17,653	10 245
12 " "	'17	852,167	*480,147	372,020	218,071	153.949
12 " "	'16	792,384	*416.006	376,378	212,798	163,580

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS

1m., Mar.,	'17	$8,412	*$9,857	†$1,445	$1,167	†$2,612
1 " "	'16	7,096	*8,465	†1,369	1,101	†2,470
12 " "	'17	125,302	*114,195	11,107	13,446	†2,339
12 " "	'16	116,967	*98,618	18,349	13,384	4,965

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., Mar.,	'17	$106,691	*$74,631	$32,060	$29,753	$2,307
1 " "	'16	100,095	*60,568	39,527	29,793	9,734
12 " "	'17	1,248,917	*858,529	390,388	358,238	32,150
12 " "	'16	1,142,425	*737,509	404,916	357,353	47,563

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

1m., Mar.,	17	$332,389	*$237,777	$94,612	$45,109	$49,503
1 " "	'16	288,094	*169,962	118,132	44,375	73,757
12 " "	'17	3,657,467	*2,287,687	1,369,780	520,841	848.939
12 " "	'16	3,201,382	*1,891,333	1,310,049	489,482	820,567

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.

1m., Mar.,	'17	$236,387	*$166,137	$70,250	$66,629	$3,621
1 " "'	'16	209,374	*139,620	69,754	66,371	3,383
12 " "	'17	2,938,421	*1,869,863	1,068,558	810,460	258,098
12 " "	'16	2,692,080	*1,568,691	1,123,389	802,370	321,019

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

1m., Mar.,	'17	$287,052	*$183,819	$103,233	$64,662	$38,571
1 " "	'16	231,887	*141,868	90,019	63,645	26,374
12 " "	'17	3,186,789	*1,955,131	1,231,658	760,429	471,229
12 " "	'16	2,563,131	*1,532,202	1,030,929	753,772	277,157

EL PASO (TEX.) ELECTRIC COMPANY

1m., Mar.,	'17	$108,183	*$67,849	$40.334	$5,114	$35,220
1 " "	'16	86,491	*47,941	38,551	4,810	33,740
12 " "	'17	1,163,578	*713,531	450,047	60,593	389.454
12 " "	'16	1,014,837	*531,703	483,134	51,960	431,174

JACKSONVILLE (FLA.) TRACTION COMPANY

1m., Mar.,	'17	$61,510	*$38,338	$23.172	$15,777	$7,395
1 " "	'16	54,731	*36,762	17,969	15,440	2,529
12 " "	'17	643,882	*431,016	212,866	185,832	27,034
12 " "	'16	612,704	*426,044	186,660	180,181	6,479

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.

1m., Mar.,	'17	$67,227	*$53,586	$13,641	$15,679	†$2,038
1 " "	'16	55,204	*45,072	10,132	16,155	†6,023
12 " "	'17	828,722	*587,706	241,016	186,001	55,015
12 " "	'16	747,892	*490,819	257,073	191,224	65,849

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

1m., Mar.,	'17	$201,328	*$137,091	$64,237	$40,906	$23,331
1 " "	'16	194,038	*121,775	72,263	42,807	29,456
12 " "	'17	2,415,890	*1,494,407	921,483	503,298	418,185
12 " "	'16	2,189,901	*1,349,511	840,390	513,680	326,710

PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.

1m., Mar.,	'17	$25,394	*$20,529	$4.865	$7,278	†$2.413
1 " "	'16	25,725	*15,955	9,770	7.188	2,582
12 " "	'17	311,898	*226,956	84,942	86,404	1,462
12 " "	'16	294,586	*178,666	115,920	90,057	25,863

PENSACOLA (FLA.) ELECTRIC COMPANY

1m., Mar.,	'17	$25,220	*$15,999	$9,221	$7,818	$1,403
1 " "	'16	24,056	*13,315	10,741	7,516	3.225
12 " "	'17	289,452	*165,299	124,153	92,764	31,389
12 " "	'16	268,463	*149,405	119,058	87,139	31,919

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

1m., Mar.,	'17	$474,478	*$262,377	$212,101	$184,024	$28,077
1 " "	'16	450,803	*254,205	196,598	182,064	14,534
12 " "	'17	5,592,604	*3,038,892	2,553,712	2,180,643	373,069
12 " "	'16	5,453,357	*3,063,650	2,389,707	2,204,581	185,126

*Includes taxes. †Deficit.

Traffic and Transportation

Seattle Limits Use of One-Man Cars

City Council Moves to Prevent Their More General Operation as Recently Authorized by the Washington Commission

The City Council of Seattle has adopted a resolution denying the right of the Puget Sound Traction, Light & Power Company to operate one-man cars, except as now authorized by the Council, and has served notice on the company that such cars will not be allowed to operate. It declares that the Public Service Commission, in authorizing the company to employ one-man cars on its lines in Seattle, reversed its opinion in the recent case of the Tacoma Railway, Light & Power Company. The resolution states that the action of the commission was unwarranted, because the case was an *ex parte* affair in which the city was interested, but had not been advised.

The Public Service Commission issued its order on April 26, so that the company could place orders for the cars and for material for conversion of single-truck cars into cars of the one-man type before the prices for material advanced, which was announced for May 1. The resolution, which was originally intended to be a mere protest against the action of the commission, was unanimously passed by the Council with a provision directing the corporation counsel to prevent the operation of one-man cars, and the Mayor said he would arrest the car men provided it was the proper method to pursue.

A paragraph in the resolution, which was adopted unanimously by the eight members present, provided that a copy of the resolution be forwarded to the company, notifying it not to purchase any cars, or to take any steps whatever to install one-man cars upon its system "until it shall have first obtained the consent of the city legislative act." The company was further notified that the city would resist by legal proceedings the violation of its franchise obligations "except as it has been relieved therefrom by or with the consent of the city of Seattle."

HOW THE SITUATION DEVELOPED

Nearly two months ago the traction company asked for the privilege of operating twenty-five one-man cars to furnish additional service on congested lines. The matter was referred to the franchise committee, before which officers of the company appeared and urged immediate action, so that an order might be placed before a proposed 25 per cent increase in prices materialized. The franchise committee, including Councilmen Oliver T. Erickson and W. D. Lane, and numbering five of the nine members of the Council, agreed to pass a bill granting the desired privilege at a meeting to be held on a Monday following, provided no patrons actually protested in the meantime. There were no protests, but instead of passing the bill, Councilman Erickson introduced a resolution denying the use of the small cars until such time as the company would allow the operation of city cars over its Third Avenue tracks and around the Jackson Street loop. The company then appealed to the commission.

The present resolution opposing the commission's order adds difficulties to a complicated situation. In accordance with a city ordinance, Corporation Counsel Caldwell brought suit some time ago to compel the company to pave between its tracks. This action was tried before Judge Kenneth Mackintosh on March 26 and the court has since held the case under advisement. The corporation counsel will immediately renew the motion of the city for dismissal of the company's application before the Public Service Commission to be released of certain franchise obligations. The commission will be asked to make an order similar to that which was issued in the Tacoma case, wherein it disclaimed jurisdiction to unburden a public utility of such obligations.

Free-Ride Order Opposed

Public Service Commission of Indiana Orders Free Transportation for Policemen and Firemen—Suit Brought in Federal Court

An application was filed on May 16 in the Federal Court at Indianapolis by the Indianapolis Traction & Terminal Company for an injunction to prevent the Public Service Commission of Indiana from enforcing a recent order which provides for the free transportation of firemen and policemen on the street railway systems of the State. Hearings were held by the commission early in May, following which an order was issued to the traction companies requiring them to carry city firemen and policemen on their cars without payment of fare in accordance with an act passed during the 1917 session of the Indiana Legislature, which amended a section of the utilities commission act. The traction companies contended at the hearing that the amendatory act is unconstitutional. The Indianapolis Traction & Terminal Company has asked a statement of the United States Court declaring the Public Service Commission's order void, that the commission be enjoined from enforcing the order and also from instituting any action, civil or criminal, for penalties for violating it, and finally, that all firemen and policemen, having notice of the suit, be denied free car rides when on duty.

The company claims that the commission, unless enjoined, "will subject the company to a multiplicity of actions, demands and penalties, which might amount to thousands of dollars." It is also charged that the commission's order is indefinite and incapable of enforcement and is, therefore, invalid, for "there is no means to ascertain when a policeman or fireman is on duty." Errors in determining the status of the firemen or policemen might also cause large penalties. It is further contended that these penalties and the intention of the commission to enforce the free-ride order will intimidate the company's employees in the discharge of their duties, encourage firemen and policemen to resist the payment of fare, cause disturbance on the cars which would discourage the public patronage.

Robert I. Todd, president and general manager of the company, stated in his affidavit that E. I. Lewis, chairman of the Public Service Commission, had advised him that the commission would give the company until Monday, May 14, to comply with the order, which was passed on May 8.

Transfer Areas Suggested

A Day's Transfers Wheeled Into Directors' Meeting to Impress the Board

At a hearing on May 18 before the ways and means committee of the Massachusetts Legislature, on the bill to relieve the financial necessities of the Boston Elevated Railway, President M. C. Brush urged that the provision which authorized the company to acquire property for inclosed transfer areas be restored to the bill. Mr. Brush reviewed the abuses of the transfer privilege in Boston, pointing out that at Central Square, Cambridge, the company is now losing $60,000 a year through the lack of an inclosed transfer area. He said that 80 per cent of the paper transfers now in use at Boston could be eliminated by the establishment of inclosed transfer areas, and that in order to impress the directors of the company with the volume of transfers issued he had recently wheeled one day's transfers in a barrow into the meeting of the board. Speaking of the abuses possible at Boston, Mr. Brush said that he recently gave a conductor a nickel and asked him to ride as far as possible on the system without paying a second fare, with the result that the employee covered more than 50 miles. Local merchants object to the establishment of transfer areas on account of its effect on their patronage.

F. E. Snow, counsel for the company, said that the purchase of the Cambridge subway by the State, and other relief measures suggested in the bill, would provide the company with capital temporarily, but that it would not yield the necessary revenue. He said that a 6-cent fare is the only ultimate solution of the company's problem.

Bonding Company for Washington Jitneys

State Insurance Commissioner H. O. Fishback, Olympia, Wash., upon receipt of an opinion from Attorney General Tanner, has announced that the Mutual Union Insurance Company, organized by jitney drivers of the State to write bonds for jitney operators, may write such bonds, provided it complies with all of the laws covering the writing of this class of business. Commissioner Fishback has announced also that the company will be required to have assets to the amount of $300,000 before bonds can be written. This decision has resulted in the issuance of a restraining order by Superior Judge Smith which forbids Prosecuting Attorney Lundin from interfering with the operation of jitney buses under the bonds written by the Mutual Union Insurance Company until a hearing is held on petitions now pending for a permanent injunction. It is probable that the jitney drivers will apply for a writ of mandamus to compel the Secretary of State and the Insurance Commission to issue a license to the company, and in the meantime will ask an injunction to prevent prosecution because they are without bonds.

W. R. Crawford, president of the mutual company, urges that the mutual insurance company statutory provision, which provides for the acceptance of contingent assets of members, be applied in rating the jitney surety company, but this Commissioner Fishback declines to do. Mr. Crawford holds that the contingent liability provision, by which each member is liable for the sum of six times his premium, is mandatory upon the commissioner in the jitney application. Under this provision, the 321 members, each paying $200 premium annually, acquire a total asset which the mutual company's representative argues is complete compliance with the law. Commissioner Fishback says he will not take this view of the case unless ordered to do so by the court.

The jitney men's case is further complicated by the fact that the receiver of the defunct Casualty Company of America, the New York firm which has heretofore written all jitney bonds in the State of Washington, has notified Secretary of State I. M. Howell that all bonds became void on May 4. Commissioner Fishback is now seeking a ruling from Attorney General Tanner as to whether the company can void the jitney bonds without refunding the unearned portion of the paid premiums.

I. C. C. Dismisses Transfer Case

The complaint filed with the Interstate Commerce Commission by C. Elton James and other residents of communities in Virginia served by the Washington & Old Dominion Railway, Washington, D. C., charging that the withdrawal of the transfer arrangement existing between that company and the Capital Traction Company subjected them to unjust and discriminatory fares was dismissed on May 5. The complaint was filed with the commission on Aug. 12, 1916.

There is no connection between the two lines, but their terminals at Thirty-sixth and M Streets in Washington are within a few feet of each other. Prior to Aug. 9, 1916, transfers from the Capital Traction Company were good on the Great Falls division of the Washington & Old Dominion Railway to Cherrydale, and on the Bluemont division to Thrifton. After that date through commutation fares to Washington were published by the Washington & Old Dominion Railway from points on both its Bluemont and Great Falls divisions. This change resulted in an increase in the total charges paid by commuters whose business brings them into the city.

The commission held that the Capital Traction Company is not subject to its jurisdiction and, therefore, it has no power to require the restoration of the transfer arrangement previously existing between the two companies. The case was ordered held open for fifteen days to give the complainants opportunity to file a request for a further hearing on the question of rates on the Washington & Old Dominion line. The rates in the present case on this line were not questioned.

Pacific Electric Men Send Out Letter

Supplementing the work of the Pacific Electric Railway employees of Los Angeles, Cal., in securing signatures on a petition for an initiative ordinance intended to bring the jitneys under more rigid control, an open letter of appeal has been sent out to the people of the city. This movement was begun by the Los Angeles Railway men some time ago in the hope of helping the company to restore its revenues and enable it to increase wages. It has been reviewed previously in the ELECTRIC RAILWAY JOURNAL. The letter read in part as follows:

"Our future and the future of our families are at stake. There are now more than 400 jitneys operating in Los Angeles County. We should be placed on a fair competitive basis with them. The jitney bus should be forced to bear the same burdens that railway service bears; forced to accept responsibility for accidents; forced to pay the same proportion of street paving; maintain service whether it pays or not; give and take transfers; operate in poorly paying territory as well as on the paying streets; give up nickel-sniping from our cars and go into the service of the public on a business basis."

Inter-Company Service Authorized

Through service over the Bay State Street Railway, Boston, Mass., and the Boston Elevated Railway between Winchester and Harvard Square, Cambridge, will soon be established as the result of an order of May 18 by the Public Service Commission. By an act of 1916 the commission was authorized to grant track locations for the establishment of through service by two or more companies in cases where the municipality has refused such location rights. In the present case the board overruled the town of Arlington and ordered a single-track connection between the two systems where the lines are to be joined. The board held that the establishment of through service would not add sufficiently to the traffic congestion on the Boston Elevated lines feeding the Cambridge subway to warrant a refusal of the Winchester petition.

Street Semaphores for Seattle.—Upon the recommendation of Superintendent of Utilities A. L. Valentine, Seattle, the City Council recently authorized the installation of semaphores at several congested street intersections. Semaphores of two different types have been installed.

Trolley Wreck Near Cleveland.—A car of the Cleveland & Eastern Traction Company, which was filled with passengers and stalled at a switch, was sideswiped on May 20 by a car going in the opposite direction. The concussion was such that the standing car tipped over on its side, injuring ten persons, one of them seriously.

More Skip Stops Before Detroit Council.—Agitation for a trial of skip-stop service on the Hamilton and Grand River lines of the Detroit (Mich.) United Railway has resulted in the introduction of resolutions in the Common Council which place the question before the Aldermen for consideration. This form of service has proved very popular on the Woodward and Jefferson lines, and the company is ready to extend its application as soon as it receives permission from the city.

City Fails to Reduce Fares.—The lack of proper procedure in advertising an ordinance seeking to reduce street car fares in Newport, Ky., to 3 cents has invalidated the measure, according to a recent decision of the Kentucky Court of Appeals, sitting at Frankfort. The ordinance would have compelled the South Covington & Cincinnati Street Railway to charge a 3-cent fare inside the city of Newport and 5-cent fares to all points on the line outside the city, with universal transfer privileges. The court sustained the finding as rendered by the Campbell Circuit Court.

Novel Anti-Parking Signs in Louisville.—Managements of office buildings and large department stores in Louisville, Ky., are making use of curb signs with the inscription: "Please Do Not Park Cars Here," written in white letters on a black field. The signs are placed at the entrances to the buildings and prove effective in keeping the street clear at those points. They are made from 6-in. x 6-in. timbers about 5 ft. long, which are sawed lengthwise to give an approximate triangular section. The inscription is placed on the sloping surface so as to be easily seen from vehicles.

Utica Fare Increase Contested.—The tariff of the New York State Railways, Utica Lines, which was filed with the Public Service Commission for the Second District, increasing by 5 cents the round-trip fares from Utica to Rome, Frankfort, Ilion, Mohawk, Herkimer and Little Falls became effective on May 15. The Mayor of Little Falls and other residents made complaint against these increases, but the complaint was not received until after the new tariffs became effective. The complaint is accordingly being served on the company as a complaint against existing fares, to which the company has twenty days to make a reply.

Albany Fare Case Settled.—In the matter of a change of fares on the lines from Albany to Troy of the United Traction Company, Albany, N. Y., which was one issue of a general controversy in that city recently the company has withdrawn its proposition. A half-hourly service is now furnished on the Albany-Troy steam belt line for a 15-cent fare, while the electric railway rate between the two cities is 10 cents, with no transfers at either end. The attempt was originally to compel a reduction in fare through a bill introduced in the Legislature, which stipulated a 10-cent fare on this line, with transfer privileges.

Costs Will Affect Fares in Detroit.—The Detroit (Mich.) United Railway, through the columns of a recent issue of its weekly publication, *Electric Railway Service*, has explained to its patrons, in a simple and straightforward manner, what the prevailing high prices mean to the electric railway industry, and that if costs continue to rise fares on that road must be expected to advance. The company estimates that an additional expenditure of $600,000 will be required this year to meet the increased cost of coal. It is pointed out that in the case of other public utilities, and also private enterprises, selling prices are regulated to suit varying costs, which is not readily done by railways.

Twin Cities Service Portrayed in Folder.—A well-illustrated booklet entitled "The Twin Cities To-day" has just been issued by the Twin City Rapid Transit Company, of which A. W. Warnock is general passenger agent. The booklet is intended to convey a cordial invitation to strangers to visit the many enjoyable places of interest in Minneapolis and St. Paul, which are sometimes characterized by the phrase "the cities of lakes, rivers and parks." It contains, besides illustrations and statistical data, colored maps of the two cities, the University of Minnesota grounds and some of the more important parks, showing the connection of trolley lines, and gives information concerning car schedules.

Electric Railway Accident Statistics.—The accident bulletin issued by the Interstate Commerce Commission for the quarter ended Sept. 30, 1916, summarizes the accidents of various kinds which occurred on electric railways during that period. According to the report there were sixty-one train accidents which resulted in the death of four persons and the injury of 210. The number of deaths resulting from ordinary train-service accidents was 153, seventy-three of which involved grade-crossing accidents; the number of injuries was 714, of which 268 were received in getting on or off cars, while 187 of these involved grade-crossing accidents. To these figures are added the number of non-train casualties, making the total number of deaths 180 and the number of accidents 1326.

Suit Brought in Duluth Fare Case.—James E. Gardner, Jr., has brought suit against the Duluth (Minn.) Street Railway in the district court of that city in an effort to test the right of that company to charge a double fare on one of its lines. This situation was reviewed in the ELECTRIC RAILWAY JOURNAL for May 5, page 848. The Public Affairs Committee granted the company permission to charge a 10-cent fare on its Morgan Park line in order that the company might get funds for extending the line to New Duluth. Many of the patrons have opposed the measure, but the city attorney pointed out that in his opinion the city could not prevent it. To make an issue, Gardner refused to pay the double fare and was put off the car, for which he is suing the company for $500 damages.

Universal Transfer System for Cincinnati.—Mayor Puchta has approved the new universal transfer schedule for Cincinnati and it is now in effect. It provides for transportation between two points by the most direct route at a fare of 5 cents, as provided in the loop lease and revision ordinance recently approved. The principal features of the system are the triple transfer provision for East End patrons, enabling them to go to Norwood or Avondale without going down town, double transfers on crosstown lines, double transfers for College Hill residents on Winton Place lines to Avondale and Winton Place, and a 5-cent fare on the Millcreek Valley line within the city limits. Each conductor has been provided with a book of 124 pages showing the transfer privileges on every line in the city.

State Commissions Order Safety Measures.—In connection with the Public Service Commission of the First District of New York, the up-State Public Service Commission at Albany has announced an order requiring the Long Island Railroad, New York, N. Y., to maintain a guard between each two passenger cars of its multiple-unit trains, to equip all such cars with vestibule gates or doors and trapdoors, which must be kept closed except when stopping at stations, and to keep trapdoors closed except when the train is proceeding between consecutive stations at which the station platforms are substantially on a level with the rails. This decision was reached after a long investigation by both commissions and after a full hearing and rehearing of the case. The commissions announced that it was necessary in order to make travel safe in the crowded commuting district involved.

Military Work Swells Traffic.—The amount of business handled by the Louisville & Southern Indiana Traction Company, New Albany, Ind., has increased as a result of the present military activities. The quartermasters' depot at Jeffersonville, Ind., is one of the important supply depots for the entire army, and a tremendous volume of business is being handled there. One of the big branches of this depot is the sewing department, which issues large quantities of material out of which the clothing for the soldiers is made. Thousands of women from across the Ohio River, who are constantly engaged on this work, reach the depot via the cross-river line to Louisville, the line to New Albany and the Jeffersonville city line. In addition there is a large amount of freight being handled, most of it by steam cars, since the government takes possession of these cars at will. Electric cars are loaded at the depot when the wagons of the company in Jeffersonville are not sufficient in number to make the collections.

Three Auto-Bus Lines for Rome.—The Public Service Commission for the Second District of New York has granted certificates of convenience and necessity for three motor-bus lines running into Rome. The Rome & Boonville Auto Bus Company, Inc., is permitted to operate through Dominick Street, North James Street, North George Street and Turin Street. A certificate is granted to the Rome & Northern Auto Bus Company to operate along North James Street and upon other streets in Rome for the purpose of delivering and picking up passengers and parcels. These lines are parts of a line to Boonville. The minimum fare is to be 15 cents, and no local passengers are to be carried within the city of Rome. J. Franklin Hyde has also received permission to operate a line from Rome to Oneida and Sylvan Beach. These buses will carry passengers and will carry freight in trailers, provided such a practice is not deemed dangerous. The route will run from James and Dominick Streets in Rome to the Oswego Road and into the town of Verona; also along South James Street to where the Rome and Verona roads intersect. In Oneida the buses will travel the usual route through that city to the bridge on Soconondа Street, over the Oneida Creek. The applicant agrees to file with the commission any proposed changes in freight and passenger rates.

Personal Mention

C. W. Bridges is now traffic agent of the Pittsburg County Railway, McAlester, Okla., having succeeded F. M. Essig.

Thomas B. Willard, assistant treasurer of the Tidewater Power Company, Wilmington, N. C., has been made assistant secretary-treasurer.

Fred E. Sterling has been appointed a member of the State Public Utilities Commission of Illinois by Governor Lowden, effective on July 1.

H. A. Bullock, secretary of the New York Municipal Railway Corporation, Brooklyn, N. Y., began service in the training camp at Plattsburg on May 22.

Harry Woollcott, secretary and purchasing agent of the Tidewater Power Company, Wilmington, N. C., has been elected treasurer of the company to succeed the late R. J. Jones.

Walter H. Taylor has resigned as solicitor at Norfolk for the Virginia Railway & Power Company on account of the pressure of other business. The duties of the office will be discharged by W. H. Venable, general attorney of that city.

Edward Dana, manager of surface transportation of the Boston (Mass.) Elevated Railway, recently gave an illustrated lecture before senior students of electrical engineering at the Massachusetts Institute of Technology on the subject of traffic studies and their importance in the fixing of schedules.

Arthur W. Brady, president of the Union Traction Company of Indiana, Anderson, Ind., on May 17 was appointed by Governor Goodrich a member of the State Council of Defense. The State Council is organized to co-operate with the Council of National Defense and will take charge of the organization and direction of all the resources of the State.

Charles G. Miller has resigned as assistant secretary of the Cincinnati (Ohio) Traction Company to accept the position of business manager of the Cincinnati Zoological Park Association. Mr. Miller had been in temporary charge of the Zoo for about six months. He began his services with the local traction company in Cincinnati about ten years ago. He served successively as secretary and chief clerk to Vice-President Draper before becoming assistant secretary of the company.

C. E. Fasoldt has been appointed engineer of power and lines for the United Traction Company, Albany, N. Y.. to succeed H. J. Childs, who is now electrical engineer for the Chateaugay Ore & Iron Company, Lyon Mountain, N. Y. Mr. Fasoldt has been in the employ of the General Electric Company, Schenectady, N. Y., since 1902. He spent about two and a half years in the testing department and has since been engaged in power-plant construction and in the office of the construction department.

A. H. Towne, who has been engineer of maintenance of way for the Berkshire Street Railway, Pittsfield, Mass., since 1914, has resigned. He will return to Springfield to resume work with the engineering firm of Durkee, Towne & White, of which he is a member. Mr. Towne entered the employ of the Berkshire Street Railway in 1901. He had charge of the construction of the company's line from Bennington, Vt., to Canaan, Conn., the extension from Great Barrington to Egremont. and also its Lee-Huntington line. No successor to Mr. Towne has yet been appointed.

George Gibbs, of the firm of Gibbs & Hill, consulting engineers, New York City, has sailed for Russia, together with five other representative railway men of this country, forming the advisory commission of American railway experts whose services are to be placed at the disposal of the Russian government. The commission, which is headed by John F. Stevens as chairman, is to act in a consulting capacity with the aim of improving the chaotic conditions existing to-day in the transportation industry in Russia. It is to lend its aid in the construction of new lines and the rehabilitation of existing railroads and their equipment, and in addition will consider the immediate problems of operation which have been such a serious handicap to Russia since the war began.

Ellsworth L. Mills, who has been chief of the track division of the Public Service Commission of the First District of New York, has resigned from the firm of Gibbs & Hill, consulting engineers to the commission, to become associated with the firm of Dilworth, Lockwood & Company, steel merchants, New York. During his connection with the commission Mr. Mills was in charge of the design and the preparation of the contracts for the track work for the city-owned lines of the dual system. Before becoming associated with Messrs. Gibbs & Hill, Mr. Mills was engaged on the Grand Central Terminal improvements of the New York Central Railroad. The supervision of track design and of all contracts for the purchase of materials has been assumed by Robert H. Jacobs, division engineer.

James Harmon, who was safety agent for the Middle West Utilities Company with headquarters at Indianapolis, has been transferred to Chicago as claim adjuster of the bureau of safety of the same interests. Mr. Harmon has been engaged in accident prevention work for several years. He received his first experience with railway operation while working as a conductor. He was one of the first to recommend street car cards to designate the proper methods of boarding and leaving cars. About 1910 Mr. Harmon became claim and safety agent for the United Gas & Electric Company and later of all the Samuel Insull properties in New Albany and Jeffersonville, Ind., and in Louisville, Ky. During that time he introduced periodical examinations for trainmen and other employees and gave other instruction in safety methods. In October, 1914, he was made safety agent for all the Insull properties in Indiana with headquarters at Indianapolis, and was succeeded in that position a few weeks ago by Frank H. Warren of the Union Traction Company of Indiana.

Bruce Cameron, superintendent of transportation of the United Railways, St. Louis, Mo., was elected president of the Missouri Association of Public Utilities at its 1917 annual convention. Mr. Cameron was born on a farm in Vernon County, Mo., in 1877. After he had completed the Nevada High School course he studied at Missouri University and later attended Fort Worth College at Fort Worth, Tex. His first connection with the United Railways was formed in 1898, when he entered the engineering department after a venture in the asphalt business at Dougherty, I. T. He was later assigned to work in the operating department of which he has since been a vital factor continuously, with the exception of a few months in 1906 when he engaged in the lumber business in Helena, Ark. The following year he returned to St. Louis to become superintendent of transportation, his present position. Mr. Cameron has shown an active interest in the welfare work of the company.

BRUCE CAMERON

Obituary

L. R. Pomeroy, consulting railway and electrical engineer, died at his home in Orange, N. J., at the age of sixty years. Mr. Pomeroy was graduated from Irving Institute, and had dealt with electric railway problems since that time. In 1902 he became connected with the General Electric Company and devoted most of his time to the study of railway electrification for several years. He also spent two years in the employ of the Safety Car Heating & Lighting Company, and in 1910 became engineer of the railway and industrial division of J. G. White & Company. A year later he entered consulting engineering work in New York City.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Eastern Transit Line, Inc., Weehawken, N. J.**—Incorporated to construct and operate a general passenger and freight line in New Jersey. Capital stock, $350,000. L. H. Smith, 911 Boulevard, Weehawken, vice-president.

Syracuse & Northern Electric Railway, Syracuse, N. Y.—Incorporated to take over the Syracuse & South Bay Railway and the Syracuse, Watertown & St. Lawrence Railway. Capital stock, $1,243,750. Incorporators: C. Loomis Allen, Talmadge C. Cherry and Alexander H. Cowle.

FRANCHISES

Wilmington, Del.—DeArmond Lindes, Philadelphia, has asked the Levy Court for a franchise to construct an electric railway beginning just outside the limits of the city of Wilmington, extending south along the county road through Farnhurst to Hare's Corner, State Road, Bear Station, Red Lion, Corbit, St. Georges, Macdonough, Odessa, Middletown, Townsend, Blackbird and Smyrna. Mr. Lindes' petition stated that he is about to organize a corporation under the laws of Delaware for the purpose of building the road, which will carry both passengers and freight.

Springfield, Ill.—The Chicago, Springfield & Cairo Railway has asked the Public Utilities Commission of Illinois for a certificate of convenience and necessity authorizing it to construct and operate a line from Springfield to Cairo, via Pawnee, Hillsboro, Greenville, Nashville, Pinckneyville, Murphysboro and Jonesboro. J. B. Campbell, president, and A. E. Taylor, secretary. [July 22, '16.]

Waterloo, Iowa.—The City Council recently passed an ordinance granting a new franchise to the Waterloo, Cedar Falls & Northern Railway in Waterloo. The franchise provides definite terms and conditions under which the company may occupy the streets and for the admission into the city of other interurban railways over the tracks of the Waterloo, Cedar Falls & Northern Railway. The franchise will be presented to the people for approval at a special election to be held June 11.

St. Clair Heights, Mich.—The Detroit United Railway has asked the City Council of St. Clair Heights for a thirty-year franchise to construct an extension on Harper Avenue from Gratiot to Montclair Avenue, thence on Montclair to Shoemaker Avenue to St. Jean Avenue, south on St. Jean Avenue to the city limits.

Kansas City, Mo.—The Kansas City Railways has received a franchise from the City Council to double-track its line on Thirty-ninth Street from Summit Street to Main Street.

Brooklyn, N. Y.—The application of the Brooklyn Rapid Transit Company for a franchise to construct an extension on Eighty-sixth Street from Fifth to Third Avenue has been referred by the Board of Estimate to its committee on franchises. One of the ideas in the extension is to accommodate patrons of the surface cars in making connections with the Fourth Avenue subway.

New Rochelle, N. Y.—The Westchester Electric Railroad has received permission from the Public Service Commission for the Second District of New York to build a second track on Main Street, New Rochelle, from Rose Street to near Harrison Street; a double-track curve from Main Street into Franklin Avenue, with curves into Rose Street and an extension of its single-track line in Winyah Avenue from North Avenue to the west city line. Local franchises for both the extensions have been approved by the commission.

Cincinnati, Ohio.—The Cincinnati, Lawrenceburg & Aurora Electric Street Railroad has asked the City Council for a renewal of its existing franchise for a period of twenty-five years. While the present franchise has eight years to run, the renewal for the twenty-five-year period is desired to conform with other franchises along the route, and for the purpose of bringing about legislation providing for rapid transit service for the western part of the city. The company also desires to relocate its present track on Lower River Road within the former villages of Delhi, Sayler Park and Fernbank on private right-of-way and on Commercial Avenue.

Pennsburg, Pa.—The City Councils of Pennsburg, East Greenville and Red Hill have passed ordinances granting the Montgomery Transit Company the right-of-way for its proposed trolley line from Norristown to Allentown. Work has been begun at Lederachville.

Milwaukee, Wis.—A franchise has been passed by the City Council of Milwaukee for the construction of an extension by the Milwaukee Electric Railway & Light Company on Mitchell Street to Muskego Avenue, on Muskego Avenue to Burnham Street and on Burnham Street to Twenty-sixth Avenue.

TRACK AND ROADWAY

***Lakeport, Cal.**—G. L. Hardison, Rialto Building, San Francisco, is reported interested in a project to construct a line from a point near Hopland to Lakeport, about 24 miles.

Georgia Railway & Power Company, Atlanta, Ga.—A contract has been entered into whereby the Georgia Railway & Power Company will furnish the electric energy for Cartersville for all private and public light and power purposes.

Chicago, Fox Lake & Northern Electric Railway, Chicago, Ill.—This company is now ready to begin construction work on its proposed line from Evanston to Palatine, via Niles Center, Niles, Park Ridge, Desplaines, Mount Prospect and Arlington Heights. It is reported the company will take over the Palatine, Lake Zurich & Wauconda Railroad, which operates a steam line from Palatine to Wauconda. From Wauconda the new line will extend north to Volo, Fox Lake, Lake Geneva, Antioch, then west and north to Elkhorn and Jefferson, Wis. L. K. Sherman, Chicago, chief engineer. [March 24, '17.]

Chicago & Interurban Traction Company, Chicago, Ill.—This company reports that it is rehabilitating its double-track lines on Western Avenue and Burr Oak Avenue in Blue Island. Trolley guards will be installed at all railroad crossings this summer.

Louisville & Southern Indiana Traction Company, New Albany, Ind.—This company has completed repairs to its State and Vincennes Street lines, damaged by the tornado in March. The repairs involved the purchase of new poles and about 2 miles of new trolley cable.

Fort Dodge, Des Moines & Southern Railway, Boone, Iowa.—It is reported that the Fort Dodge, Des Moines & Southern Railway will expend $250,000 in extensions and improvements.

Tri-City Railway, Davenport, Iowa.—Work will soon be begun by the Tri-City Railway on the reconstruction of its tracks on Rock Island arsenal island from Fort Armstrong Avenue to the arsenal shops. It is estimated that the work will cost about $60,000.

Union Traction Company, Coffeyville, Kan.—A committee of Claremore business men has been appointed to confer with officials of the Union Traction Company with a view to the extension of that company's line from Nowata to Claremore, thence to Tulsa via Collinsville.

Boston (Mass.) Elevated Railway.—The legislative committee on metropolitan affairs on May 21 voted to report favorably the bill providing for the extension of the Malden subway to Everett. The act is made contingent upon acceptance by the municipal government of the two cities and also acceptance by the directors of the Boston Elevated Railway.

Michigan Railway, Kalamazoo, Mich.—Chief Construction Engineer Watkins of the Michigan Railway has stated that it is possible that the route of the proposed line from Owosso to Flint will be changed. The possibility of expensive litigation to get the right-of-way is responsible for the company looking for another route.

***Lansing, Mich.**—It is reported that an electric railway may be constructed from Lansing to Mount Pleasant, via Alma. Marcus Polasky, Alma, is interested.

Southwest Missouri Railroad, Webb City, Mo.—This company plans to extend its line from Baxter Springs, Kan., to Pilcher, 7 miles. This will be a continuation of its extension from Galena to Baxter Springs.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—This company will improve the roadway between its rails in the boroughs of Pennington and Hopewell.

International Railway, Buffalo, N. Y.—Work will be begun at once by the International Railway on the construction of an extension of its Delavan Avenue line to Ridge Road and along the Ridge Road to Schiller Road.

East Liverpool Traction & Light Company, East Liverpool, Ohio.—Work has been begun by the East Liverpool Traction & Light Company repairing the Chester-East Liverpool bridge. A number of other repairs to the tracks in East Liverpool are also under way or will be begun in the near future.

Mansfield Public Service & Utility Company, Mansfield, Ohio.—This company is erecting a new bridge over the Pennsylvania Railroad lines at Spring Mills.

Ohio Electric Railway, Springfield, Ohio.—Work has been begun by the Ohio Electric Railway rebuilding the temporary bridge across the Miami River south of Middletown. A portion of the bridge, 300 ft. in length, was torn away during the high water of early March.

Sand Springs (Okla.) Railway.—It is reported that the Sand Springs Railway is considering the use of the surface contact system for the operation of its line between Tulsa and Sand Springs in place of the overhead system now being used.

St. Thomas (Ont.) Municipal Railway.—The City Council of St. Thomas has under consideration the construction of an extension of the St. Thomas Municipal Railway to Pinafore Park. A trestle to cost $8,000 will be erected at Elm Street hill.

Beaver Valley Traction Company, New Brighton, Pa.—A new signal system has been installed by the Beaver Valley Traction Company along its single-track line in Bridgewater.

Stroudsburg (Pa.) Passenger Railway.—Work will be begun at once by the Stroudsburg Passenger Railway reconstructing its track along Washington Street between the State bridge and Crystal Street.

Bristol (Tenn.) Traction Company.—According to a resolution recently passed by the City Commissioners of Bristol, the Bristol Traction Company will be asked to remove all the poles, track, ties and trolley owned by the company on West State Street west of Little Creek in Bristol.

Yakima Valley Transportation Company, North Yakima, Wash.—This company plans the construction of a 3-mile extension to its Selah branch, and a 1-mile extension in the Wide Hollow-Summit View district west of the city. Both extensions will enter heavy fruit districts.

Tacoma Railway & Power Company, Tacoma, Wash.—This company's plan of co-operation with the city of Tacoma in establishing and operating the municipal street car line to the Todd shipyards on the tideflats was recently accepted by the City Council and signed by the Mayor. The question of operating the line is left open to final settlement, but it is probable the city will operate the line. No mention is made of a transfer agreement. The Tacoma Railway & Power Company gives up its franchise to operate the present Eleventh Street line, municipally-owned, to take effect when the proposed extension to the Todd plant is completed.

SHOPS AND BUILDINGS

Chicago & Interurban Traction Company, Chicago, Ill.—This company reports that it has just completed and is now using its new terminal tracks and building in Kankakee.

Evansville (Ind.) Railways.—The city of Evansville will construct a station at Howell, a suburb, to be used by the Evansville Railways and the Louisville & Nashville Railroad. The structure will cost about $60,000.

Worcester (Mass.) Consolidated Street Railway.—Bids have been asked by the Worcester Consolidated Street Railway for the construction of two trolley freight terminals at Shrewsbury and Albany Streets, near Boulevard Park, one to be used by the Boston & Worcester Street Railway and the other by the Worcester Consolidated Street Railway. The stations will be 280 ft. long and 30 ft. wide, of mill construction on concrete foundations and provided with loading platforms. One will have a second story at one end to provide offices for the freight department clerical force. The contemplated cost of construction is about $75,000.

Windsor, Essex & Lake Shore Rapid Railway, Kingsville, Ont.—Fire recently damaged the carhouse and power plant of the Windsor, Essex & Lake Shore Rapid Railway to the extent of about $150,000.

Jefferson County Traction Company, Beaumont, Tex.—Work will be begun at once by this company on the construction of a new interurban station on Waco Avenue between Proctor and Fifth Streets. Two buildings will be constructed, one to be used for the interurban station and the other for the interurban express station. The buildings will be one story high and will be constructed of hollow tile and will have a stucco finish. It is estimated that the completed station will cost approximately $20,000.

POWER HOUSES AND SUBSTATIONS

Pacific Electric Railway, Los Angeles, Cal.—Work will soon be begun by the Pacific Electric Railway on the construction of a mechanical plant in San Bernardino to handle all repairs for the company on the eastern division, or all the lines in southern California east of Upland. The cost is estimated at about $50,000.

Chicago & Interurban Traction Company, Chicago, Ill.—This company reports that it is installing automatic control of the 500-kw. rotary in its substation at Monee and is equipping one 300-kw. portable rotary for use where service may require.

Galesburg Railway, Lighting & Power Company, Galesburg, Ill.—This company contemplates improvements to its power plant.

Springfield (Mass.) Street Railway.—A new substation will be erected by the Springfield Street Railway at 101 Margaret Street to cost about $30,000.

Delta Light & Traction Company, Greenville, Miss.—This company reports that it has purchased one GE 1000-kw., 2300-volt, 60-cycle, three-phase high-pressure turbine and one barometric condenser from the Ingersoll-Rand Company, delivery to be made on Jan. 1, 1918.

Poughkeepsie & Wappingers Falls Electric Railway, Poughkeepsie, N. Y.—Improvements in its power plant are being contemplated by this company.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—This company is constructing a new transmission line from Lowellville to Masury. Work has been begun on the construction of a large outdoor substation at Masury, at which the transmission line will terminate. The company has practically completed the remodeling of its Sharon substation, which has been made fireproof throughout. Much new apparatus has been installed and other equipment is expected shortly.

Charleston Consolidated Railway & Light Company, Charleston, S. C.—A transformer station will be erected by the Charleston Consolidated Railway & Light Company costing about $5,000.

South Carolina Light, Power & Railways Company, Spartanburg, S. C.—This company contemplates a number of extensions to its transmission lines.

Roanoke Railway & Electric Company, Roanoke, Va.—This company is rehabilitating its Walnut Avenue power plant and increasing its capacity from 6000 hp. to 19,075 hp., at a cost of approximately $300,000.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—This company will construct a frame substation building at First Avenue South and Spokane Street, having a motor generator with 500-kw. capacity, to be increased later to 1000 kw. The building and equipment will cost $12,000.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Gear Deliveries Set at Three to Four Months

Delivery Is Dependent on the Receipt of Blanks—Standardization Hardly Possible

During the past year, as a result of the shortage in gears, there have been several long delays in the assembling of equipment under new cars. Therefore the present status in the gear delivery situation should command attention. This paper was recently requested by the purchasing department of a large railway company to present in the "Manufactures and Markets" department a summary of the delivery conditions for railway motor gears as given by the various prominent manufacturers of this very important part of car propulsion equipment.

FOUR MONTHS DELIVERY

According to the largest producers of railway gears, the delivery on treated gears may be stated as three to four months. This is a close limit, however, and one manufacturer says: "We believe that no railroad is safe at the present time unless it has forecast its delivery needs by four to five months. We are strongly recommending that all purchases be made now for one year or more in advance with bona fide orders placed now and delivery spread out as the customer may require the material. This will enable us to lay in our raw materials at present prices and to protect the customers on the later deliveries."

All manufacturers, of course, when a real emergency arises, will exert every effort to anticipate gear deliveries under the three or four months' limit stated above. It is understood that it is the regularly quoted delivery.

One large manufacturer is quoting treated pinions and untreated gears at ten weeks, and makes the following explanation: "These promises are based on gears and pinions which are standard with us and which are sizes that can be cut from our standard blanks. In cases where a customer demands special gears and pinions, the best shipment which we could offer is from six to seven months. The limiting feature on any special gear or pinion would be the securing of satisfactory blanks from the steel manufacturers." In this connection one manufacturer has stated that, due to the abnormal pressure put upon the steel plants, the standard of inspection has necessarily fallen with the demand for increased tonnage. This results in more rejections in the gear cutting plants, even after work has been started on the castings or blanks. It is understood that the gear cutters are endeavoring in every possible way to maintain their previous standards of inspection.

DELIVERIES ON PINIONS POOR

Another large manufacturer comments on deliveries as follows: "On certain types of railway gearing we may have a goodly quantity of castings or forgings in stock which could be turned out in a minimum time. In other cases where we are to order the castings or blanks the delivery would appear unreasonable. However, inasmuch as other gear manufacturers purchase from the same or similar sources of supply, their conditions would be the same, varying only with those cases where they may have a good stock of material on hand. Of course the gear situation is worse than on pinions because so many different types must be kept in stock to cover all requirements. We aim to keep on hand enough castings and forgings to supply rush requirements on those types of motors where the demand is great, in both treated and untreated grades.

"In the case of cast steel gears it requires approximately eight weeks to get castings, while on forged steel the conditions are much worse, the promises now being given by the steel companies at six to eight months. This covers both treated and untreated gearing. In the case of pinions, where a small shipment is required to keep a car running, we can fill a small order in ten days to two weeks and large quantities in correspondingly good time. This is based upon the assumption that we will have the forgings in stock, which we have for all ordinary sizes. While it is not quite so difficult to obtain pinion forgings as it is gear forgings, it is requiring approximately two months to make deliveries."

On the subject of greater standardization of railway motor gears, the manufacturers are a unit in agreeing that more complete standardization would be of great benefit. It is the belief, however, that complete standardization is impossible without a sacrifice of the mechanical end, and one manufacturer states that this would more than offset the inconveniences to him in having to manufacture such a great number of non-standard gears.

Used Rails Bring Record Prices

Light Rails Sold Well Into 1918—Scarcity of Rerolling Rails Marked—Production in 1916 About 3,000,000 Tons

That the prices in the steel market are abnormal is apparent from the fact that old rails are actually worth as much or more than new tonnage, which brings $38 to $40 a ton, these being the prices of standard sections of Bessemer and of open-hearth rails, respectively. Scrap rails have been sold in Chicago for as high as $30 a ton and in Pittsburgh for practically the same amount. In Philadelphia they have brought in the neighborhood of $35 a ton. These old rails which are still in condition for use have been sought for eagerly by many purchasers who would be glad to get these rails rather than to wait for a year or more to secure tonnage already on order.

At the present time no large orders are being placed for standard sections, but orders for light rails are active from coal mining and lumber interests. The mills rolling light rails from billets are sold up for at least a year, and on this account numerous sales of light rails have been reported at about $5 a ton higher than recent prices. The scarcity of rerolling rails is more marked than usual because on this product the mills are sold up well into 1918.

At the present time about 60,000 tons of rails have been purchased in this country for delivery in 1919. Canada is in the market for rails, as nearly 600 miles of old rail has been torn up in the Dominion and shipped to France to be used in the construction of railroads that supply the troops at the front. It is evident that these rails must soon be replaced in Canada, or railroad facilities there will be crippled in many sections.

PRODUCTION OF STEEL RAILS BEST SINCE 1913

The total production of steel rails of all kinds in the United States in 1916 was 2,854,518 tons, as against 2,204,203 tons in 1915 and 1,945,095 tons in 1914, according to the figures compiled by the American Iron and Steel Institute. The record year was 1906, when 3,977,887 tons were produced.

The production of all kinds of rails in 1916, classified according to their weight per yard, was as follows:

Gross Tons	Under 50 Lb.	Under 85 Lb.	85 Lb. and Over	Total Gross Tons
Open-hearth steel rails..	134,594	313,840	1,821,166	2,269,600
Bessemer steel rails....	28,378	252,076	159,638	440,092
Other	132,563	875	11,388	144,826
Total	295,535	566,791	1,992,192	2,854,518

Of the 1916 output 2,269,600 tons were produced by the open-hearth process, 440,092 tons by the Bessemer process and 144,826 tons were rerolled.

The production of steel rails in the last ten years by weight was as follows:

Years	Under 45 Lb.	45 Lb. and Less than 85	85 Lb. and Over	Total Gross Tons
1907	295,838	1.569.985	1,767,831	3,663,654
1908	183,869	687.632	1,049,514	1,921,015
1909	255,726	1,024,856	1,743,263	3,023,845
1910	222,662	1,285,972	2,125,395	3,634,029
1911	218,758	1,067,696	1,536,336	2,822,790
1912	248,672	1,118,592	1,960,651	3,237,915
1913	270,405	†967,313	2,265,062	3,502,780
1914	*238,423	‡309,865	1,396,807	1,945,095
1915	*254,101	†518,291	1,431,811	2,204,203
1916	*295,535	†566,791	1,992,192	2,854,518

*Includes rails under 50 lb. †Includes 50 lb. and less than 85 lb.

Associated Manufacturers Act on War Revenue Tax

"Better Business" Adopted as New Slogan—Section Meetings and Election of New Officers

At a meeting of the board of governors of the Associated Manufacturers of Electrical Supplies, held in New York on May 16, a telegram was sent to the finance committee of the United States Senate and to the United States Chamber of Commerce in regard to the act on war revenue tax. It was to the effect that while it would accept without demur the decision ultimately reached, the board believed that the principle upon which the English government bases the assessment of so-called excess profit taxes is superior to that embodied in present United States legislation from the viewpoint of equity, simplicity and continuing business activity.

H. B. Crouse, president of the Crouse-Hinds Company, Syracuse, N. Y., was elected president at the meeting. He succeeds Robert K. Sheppard, the first president, who expressed a desire for rotation in the chief executive office. A. W. Berresford, Cutler-Hammer Manufacturing Company, Milwaukee, Wis., was elected vice-president. J. W. Perry, H. W. Johns-Manville Company, was re-elected treasurer. Charles K. Dustin, the general secretary, also was re-elected.

SECTION OFFICERS ELECTED

At the meeting of the wire and cable section, held on April 17, the following officers were re-elected: LeRoy Clark, chairman, Safety Insulated Wire & Cable Company, New York; J. Nelson Shreve, secretary, Electric Cable Company, Bridgeport, Conn.; Edward F. Sawyer, treasurer, Atlantic Insulated Wire & Cable Company, New York. The line material section elected the following officers on May 4: W. R. Williams, chairman, General Electric Company, Schenectady, N. Y.; H. L. Garbutt, secretary, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; R. C. Buell, treasurer, Johns-Pratt Company, Hartford, Conn.

"Better Business," which was suggested by Robert McKean Thomas, president of the Thomas & Betts Company, New York, has been adopted as the slogan for the association.

Electric Power Club Announces Program

The annual meeting of the Electric Power Club will be held at the New Willard Hotel, Washington, D. C., on June 11 and 12. The program for the first day will be devoted to routine business and important standardization work, which will include the following classes of equipment: Fractional horsepower motors, large d.c. motors, adjustable-speed motors, d.c. generators, large polyphase motors, wearing depth of commutators.

On the second day Howard E. Coffin will make an address on general manufacturing problems in connection with the present national emergency. C. E. Patterson, comptroller of the General Electric Company, will give his paper on "Uniform Cost Accounting," and perhaps a short talk will be made by a representative of the Federal Trade Commission. There will also be a paper by a member of the club analyzing manufacturing conditions during the last two years and showing the causes of increased costs. There may also be some matters that the Army and Navy Departments may wish to present.

The idea underlying this program is to assist every member company in putting its own "house in order" and fitting itself to be of the greatest use to the nation at this time of stress.

Pole Shipments Restricted by Car Shortage

In the issue of May 5, page 853, there appeared an interview with A. L. Johnston, sales manager Electric Railway Equipment Company, Cincinnati, Ohio. The data which were presented included the average prices of tubular steel poles for each year since 1895. Attention is called to the fact that the name of Mr. Johnston's company was incorrectly printed.

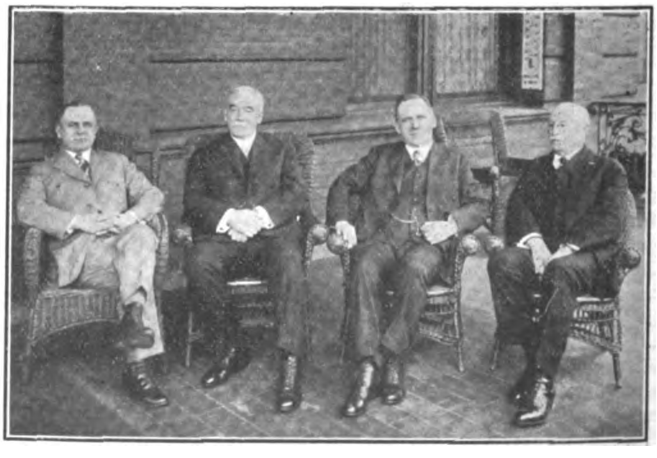
In connection with the pole delivery situation mentioned in the previous article, Mr. Johnston states that the Electric Railway Equipment Company now has ready for shipment a number of pole orders but is unable to secure cars for shipment. It is understood that the manufacturers in the Ohio River and Lake districts are to be restricted to the use of but 20 per cent of the gondola cars formerly available. The reason for this ruling is stated to be that the cars are required for hauling coal and ore from the lake ports.

Mailing Catalogs for Export

Letters are frequently received at the foreign consulates from manufacturers in the United States who send their catalogs and ask for reports on the market for their supplies. As all mail matter is necessarily subjected to a good deal of wear while en route, it frequently happens that the wrapper of the catalog is torn off. The result is that a considerable number of catalogs mailed not only to the consulates but also to business houses never reach their destination, and it would seem to be to the advantage of the American exporters to see to it that their catalogs are so wrapped as to insure safe arrival. It also frequently happens that catalogs do not reach the consulate for days, or even weeks, after the arrival of the letters which announce that the catalogs have been sent. It would therefore be best to mail the catalogs in advance of the letters, if possible, in order to insure the prompt return from the consulate of the information desired.

Gear Manufacturers' Convention

Brief mention was made last week in these columns of the recently organized American Gear Manufacturers Association which held its first convention at the Hotel Schenley, Pittsburgh, Pa., on May 14 and 15. In view of the present national situation this convention will undoubtedly have a very important bearing on the efforts being put forth by the government for absolute standardization in all lines of manufacture. In addition to the four papers previously



LEFT TO RIGHT: F. W. SINRAM, FRANK HORSBURGH, F. D. HAMLIN AND H. EBERHARDT mentioned, which were presented, George L. Markland discussed the "Difficulties of Gear Standardization." An inspection trip was made to the works of the Westinghouse Electric & Manufacturing Company at East Pittsburgh, Pa., where the delegates witnessed methods of manufacturing Bakelite-Micarta for gears, after which they were the guests of the Westinghouse Company at a dinner in the club rooms of the Pittsburgh Athletic Association.

The officers of the association shown in the accompanying illustration are F. W. Sinram, Van Dorn & Dutton Company, Cleveland, President; H. E. Eberhardt, Newark Gear Cutting Machine Company, Newark, N. J., vice-president; F. D. Hamlin, Earle Gear & Machine Company, Philadelphia, secretary, and Frank Horsburgh, Horsburgh & Scott, Cleveland, treasurer.

Copper Market Shows Improvement

The copper market shows some improvement, although most buyers are holding off until some definite announcement about government purchases has been made. According to the *Wall Street Journal* of May 23: "One large public utility corporation has contracted for its requirements through the last half of the year at 29 cents a pound. Representatives of leading producers mention 28 cents a pound as a probable level for deliveries in the last half of the year to be fixed by the government."

In reviewing the copper market, the *Wire Message*, the official publication of the Habirshaw Electric Cable Company and of the Electric Cable Company, says in part:

"Without some knowledge on which to base an estimate of what our government and its allies are going to require during the next six or eight months, and some positive knowledge of the terms on which sales will be made, a condition of uncertainty must prevail. One fact should be clearly understood—though it does not seem to be: Whatever concession is made to our government and its allies, it concerns only the producers making the concession, and cannot be taken as indicating what the price of copper should be, based on the law of supply and demand. This law must ultimately prevail in fixing the price to the outside public."

NEW YORK METAL MARKET PRICES

	May 3	May 26
Prime Lake, cents per lb	31	31½
Electrolytic, cents per lb	31	31½
Copper wire base, cents per lb	36	36
Lead, cents per lb	9⅞	10⅞
Nickel, cents per lb	50	50
Spelter, cents per lb	9½	9½
Tin, Straits, cents per lb	58½	65½
Aluminum, 98 to 99 per cent, cents per lb	60	60

OLD METAL PRICES

	May 3	May 26
Heavy copper, cents per lb	24½	27½
Light copper, cents per lb	21½	25
Red brass, cents per lb	18½	19½
Yellow brass, cents per lb	17½	18
Lead, heavy, cents per lb	7¾	8½
Zinc, cents per lb	7	7
Steel car axles, Chicago, per net ton	$41.50	$42.50
Iron car wheels, Chicago, per gross ton	$24	$30.50
Steel rail (scrap), Chicago, per gross ton	$31.50	$34.50
Steel rail (relaying), Chicago, per gross ton	$39	$39
Machine shop turnings, Chicago, per net ton	$11.00	$12.50

CURRENT PRICES FOR MATERIALS

	May 3	May 26
Rubber-covered wire base, New York, cents per lb.	36½	36½
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable stranded, New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40	$40
Rails, heavy Bessemer, Pittsburgh, per gross ton.	$38	$38
Wire nails, Pittsburgh, per 100 lb.	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.85	$4.00
Steel bars, Pittsburgh, per 100 lb.	$4.00	$4.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$6.35	$6.85
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$7.55	$7.55
I-beams over 15 in., Pittsburgh, cents per lb.	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$4.15	$4.15
Cement (carload lots), New York, per bbl.	$2.12	$2.12
Cement (carload lots), Chicago, per bbl.	$2.16	$2.16
Cement (carload lots), Seattle, per bbl.	$2.60	$2.50
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.21	$1.23
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.22	$1.24
White lead (100 lb. keg), New York, cents per lb.	10¾	11¾
Turpentine (bbl. lots), New York, cents per gal.	52	49

ROLLING STOCK

Orleans-Kenner Interurban Railway, New Orleans, La., will purchase seven trail cars.

Chicago & Interurban Traction Company, Chicago, Ill., expects to purchase one semi-steel passenger motor car.

Northern Electric Company, Chico, Cal., is constructing six freight cars in its shops.

Billings Railway, Light & Power Company, Billings, Mont., which was recently incorporated for $300,000, expects to electrify the local lines which are now operated by storage-battery cars. It has been reported that this company has placed an order for several pay-as-you-enter cars.

Georgia Railway & Power Company, Atlanta, Ga., noted in the May 5 issue as expecting to build ten pay-as-you-enter cars, has decided upon the following details for this equipment:

Number	10
Delivery	During the year
Builder	Georgia Ry. & Power
Type	Pay-as-you-enter
Seating capacity	42
Weight (total)	34,000 lb.
Bolster centers, length,	21 ft. 2½ in.
Length over bumpers	44 ft. 0 in.
Length over vestibule	43 ft. 0 in.
Width over all	8 ft. 2¾ in.
Rail to trolley base	12 ft. 1½ in.
Body	Semi-steel
Interior trim	Cherry
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse
Axles	Carnegie
Bumpers	Not specified
Car trimmings	Dayton Mfg. Co.
Conduits	Not specified
Control, type	K-35-G
Couplers,	Stationary draw heads and bar
Curtain fixtures,	National Lock Washer
Curtain material	Pantasote
Designation signs,	Made by company
Door mechanism,	Made by company
Fare boxes	None
Fenders or wheelguards,	Not specified
Gears and pinions	Nuttall
Hand brakes	Not specified
Heaters	Consolidated
Headlights	Golden Glow
Journal boxes	Brill
Lightning arresters	GE.
Motors	GE. No. 201, outside hung
Paint, varnish	Hildreths
Registers	International
Sanders	O-B air sanders
Sash fixtures	Dayton
Seats	Hale & Kilburn
Seating material	Rattan
Springs	Brill
Step treads	Not specified
Trolley catchers	Keystone
Trolley base	GE.
Trolley wheels,	Made by company
Trucks, type	Brill No. 39-E-1
Ventilators	Railway Utility
Wheels	33 in. and 22 in.

Oklahoma Union Traction Company, Tulso, Okla., noted in the April 21 issue as placing an order with the American Car Company, has specified the following details for part of this equipment:

Details for Motor Cars		Baggage and Express Motor Car
Number of cars ordered	6	1
Builder	American Car	American Car
Type	Double-end pay-as-you-enter one-man safety car	Baggage and express motor car
Seating capacity	34	
Bolster centers, length	———	32 ft. 4 in.
Length over bumpers	27 ft. 9½ in.	50 ft. 0 in.
Length over vestibule	26 ft. 9½ in.	48 ft. 0 in.
Width over all	8 ft. 0 in.	9 ft. 0 in.
Rail to trolley base	12 ft. 6 in.	12 ft. 11¾ in.
Body	Semi steel	Semi-steel
Interior trim	Statuary bronze	Iron and bronze
Headlining	None, rafter finish	
Roof	Arch	Arch
Air brakes	Safety Car Devices Co.	
Axles	Brill	Brill
Bumpers	American Car..channel iron	Rico anti-climber
Car trimmings	Brill	Brill
Control, type	GE.-K-10	
Couplers	None, pull bars used	Tomlinson MCB radial
Curtain fixtures	Curtain Supply	
Curtain material	Pantasote	
Designation signs	Hunter	
Door mechanism:	Safety Car Devices Co.—air-operated	
Wheelguards	HB. Life Guards	American Car—steel Pilots
Gears and pinions	GE.	GE.
Hand brakes	American Car with Pittsburgh ratchet drop brake handle	American Car with vertical wheel
Heaters	Consolidated Car Heating Co.	
Headlights	Golden Glow S-M-95	Golden Glow T-128
Journal boxes	Brill	Brill
Lightning arresters	GE.	GE.
Motors	Two GE.-258-A inside hung	Four GE. No. 217, inside hung
Paint	———	American Car
Sanders	Keystone	Nichols-Lintern air-type
Sash fixtures	O. M. Edwards	American Car
Seats, style	American Car lightweight reversible	
Seating material	Mahogany, steel, and canvas lined rattan	
Springs	Brill	Brill
Step treads	Feralun	
Trolley catchers	Keystone	
Trolley base	GE.	GE.
Trolley wheels or shoes	GE.	GE.
Trucks, type	Brill 78-M-1 Special	Brill 27-MCB-3
Ventilators	Brill exhaust, 6 per car	
Wheels	24 in. diam.	37 in., MCB steel
Special devices	Faraday high voltage push button system	

TRADE NOTES

McIntosh & Seymour Corporation, Auburn, N. Y., has changed its New York office from 50 Church Street to 149 Broadway.

American Conduit Company, New York, N. Y., is building a new plant at Fulton, N. Y., for the manufacture of its specialties.

Driver-Harris Wire Company, Harrison, N. J., has filed notice of change in company name to the Driver-Harris Company, Inc. The capital of the company has been increased to provide for business extensions.

Kansas City (Mo.) Railways have closed a contract with the International Register Company for 600 International metal ticket fare boxes to be put in service as soon as they can be constructed.

Ohio Brass Company, Mansfield, Ohio, announces that it has received an order from the Boston Elevated Railway for 800 standard trolley crossovers of the live, rigid and adjustable types equipped with renewable cam tips.

Walter A. Zelnicker Supply Company, St. Louis, Mo., announces that A. R. Topping, who has been associated with the company for the past eleven years, has been elected secretary.

Coto-Coil Company, Boston, Mass., has been incorporated with a capital stock of $100,000 to manufacture machines for electric coil winding. Robert A. Leeson is president and Frank N. French, 95 South Street, Boston, is treasurer.

Morgan Crucible Company, New York, N. Y., has moved from 114 Liberty Street to 519 West Thirty-ninth Street. The company's factory is being moved from Brooklyn to New York, so that it will not only have larger quarters but also gain the advantage of having factory and office under one roof.

Clive Runnels, who for the last two years has been assistant to the president of the Pullman company, has been elected vice-president of the corporation. Previous to coming to the Pullman company, Mr. Runnels was connected with the Western Steel Car & Foundry Company and the American Car & Foundry Company. Mr. Runnels will continue in his capacity as assistant to President J. S. Runnels.

American Railways Equipment Company, Dayton, Ohio.—In testing out fare boxes to be installed on ten new cars only one failure of the fare box mechanism was reported after six days' trial, that failure being a pin sheared in one of the gears. Minor difficulties experienced by conductors with fare boxes were overcome after a few days' use of the new device.

Dunn Wire-Cut Lug Brick Company, Conneaut, Ohio, wired Secretary of War Baker, as soon as war was declared, tendering the output of the sixty-eight paving brick plants in twelve states, which operate under Dunn license, for supply of wire-cut lug brick for immediate use in building military roads. This company also offered the government free advisory and inspection services of its corps of expert engineers in making surveys and constructing wire-cut lug brick roads designed for military purposes.

Wigmore, Hall & Company, 445 Pacific Electric Building, Los Angeles, Cal., has been formed to carry on the railway-supply business heretofore conducted under the name Alphonso A. Wigmore. The company is the Pacific Coast representative of the Railway Improvement Company and several other railway-supply manufacturers. This reorganization has been effected to permit the enlargement of the company's sales territory and the increase of lines handled. Mr. Wigmore has been a Pacific Coast railway sales representative for many years, while Charles Watts Hall is a railway engineer conversant with the actual installation of railway equipment. The company will be pleased to hear from manufacturers who desire to increase their business on the Pacific Coast.

General Railway Signal Company, Rochester, N. Y., announces that C. O. Poor, formerly assistant resident manager of the Chicago district and later in charge of this company's munition plant, has been appointed president and general manager of the General Railway Signal Company of Canada. Ltd., and is now located at Montreal. Mr. Poor came to this company in 1905 from the Hall Signal Company. From 1905 to 1912 he was superintendent of the company at the Rochester plant and in 1912 was made assistant resident manager at Chicago. V. I. Smart has been appointed consulting engineer. F. H. Jones, who has been with the company for more than twelve years, has returned to his former position as assistant resident manager of the Chicago district, and will be located in the Peoples Gas Building, Chicago.

Bare Wire Company, Inc., New York, N. Y., has been incorporated under the laws of the State of New York with a capitalization of $500,000. The offices of the company are at 10 East Forty-third Street. This new company has acquired from the N. Y. C. & H. R. R. R. a valuable tract of land in Yonkers. It will proceed at once to erect a building and instal the most modern machinery for the manufacture of all forms of bare copper wires and cables. The company is closely affiliated with the Habirshaw Electric Cable Company and the Electric Cable Company. One of the principal purposes of the new company is to assure the two above-named companies at all times an adequate supply of every size of wire needed to enable them to give prompt and efficient service to their customers. The incorporators of the Bare Wire Company are Edwin W. Moore, J. Nelson Shreve, G. F. Waterbury, John S. Keith and Thomas C. Perkins.

ADVERTISING LITERATURE

W. N. Matthews & Brother, St. Louis, Mo.: A folder descriptive of their "Scrulix" anchors.

Hickey & Schneider, New York, N. Y.: Bulletin No. 50 descriptive of Burn-Boston carbon-ground cones.

V. V. Fittings Company, Philadelphia, Pa.: A folder descriptive of its safety switches designed particularly to protect the operator as well as the entire installation.

MacGovern & Company, New York, N. Y.: A catalog on power machinery and contractors' equipment. Contains lists of electrical, hydraulic, steam and gas machinery available for immediate delivery.

B. F. Goodrich Rubber Company, Akron, Ohio.: A thirty-six-page bulletin on Goodrich products, including packing, belting, molded goods, insulated wire, battery jars and miscellaneous hard rubber goods.

Westinghouse Church Kerr & Company, New York, N. Y.: A bulletin, "The 1916 W. C. K. City." All the buildings shown, costing more than $60,000,000, were built during 1916, and all of them were designed and constructed throughout by the Westinghouse Church Kerr organization.

General Electric Company, Schenectady, N. Y.—Bulletin No. 43,503 on "The Application of Novalux Units to Ornamental Street Lighting." This bulletin contains thirty-six pages illustrating correct lighting units for business streets, residential streets and outlying districts.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: A neat and attractive publication of the address, "A Plea for Defense of Human Rights and Liberty" presented by President Woodrow Wilson before the Sixty-seventh Congress, on Monday, April 2, 1917.

Ingersoll-Rand Company, New York, N. Y.: Bulletin 3311 covering Imperial type X duplex steam-driven compressors. Tables of sizes and capacities given; also Bulletin 8507 on Little David pneumatic drills. Models shown with recommendations as to character of work for which they are best adapted.

La Clede-Christy Clay Products Company, St. Louis, Mo.: A bulletin, "Now What Is Going to Happen?" The relations between consumers' demand, visible raw materials and average price levels for the last three years are illustrated appropriately. A short résumé of present market conditions is also given.

William P. Bonbright & Company, New York, N. Y.: A twenty-page pamphlet, "United States War Loans." This gives a brief but comprehensive outline of the loans issued by the United States government since Revolutionary days. The general features of the present Liberty Loan are discussed, and the full text of the law authorizing it is appended.

Electric Railway Journal

Published by the McGraw-Hill Publishing Company, Inc.
Consolidation of Street Railway Journal and Electric Railway Review

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PUBLICITY AND THE SKIP STOP By means of a well-planned, persistent and frank method of publicity, the United Railways & Electric Company has secured public support for the adoption of the skip stop on two of its lines in Baltimore. Electric railway officials ought to be greatly interested this week in Mr. Burroughs' story of how this result has been secured. In the main, the skip-stop idea has been sold to the conservative Baltimore public upon the basis of time-saving. There have been objectors, of course, but it has been apparent that the motive in practically all cases was pure selfishness, and the serious-minded part of the public, we imagine, has not been slow to see this point. The success of the plan in Baltimore, which already has resulted in faster schedules, more service and a saving in operating costs, should encourage other electric railways to try to adopt this skip-stop plan. There will be, in almost any city, a certain amount of public inertia or unreasoning hostility, but if the advantages of the plan are thoroughly and frankly explained, we believe that public interest will be aroused and that most of the arbitrary opposition will be overcome. Without doubt the present moment is the psychological one for pressing the point, for the admitted need of conservation of national resources of all sorts may well make the public look more sensibly upon efforts to use improved methods of operation.

GOVERNMENT OWNERSHIP IS NOT A SOLUTION Of late the burdens of railroad and utility operation have grown to such volume that it has become evident that, if private corporations serving the public are to progress, they must have more revenues. In some cases, however, the old cry has been raised, why not government or municipal ownership and operation? The inference, of course, is that with given rates the publicly managed corporation can attain prosperity and a state of full development much more easily than can the private company. Nothing could be further from the truth. In support of this contention we wish to cite the opinion of W. M. Acworth, the noted English authority, as recently expressed before a special hearing of the Newlands joint committee on interstate commerce. In his opinion, history conclusively refutes the idea that government ownership promotes development. If, under existing rates, private capital is not being found in sufficient quantity for extensions and improvements that are urgently necessary, to suppose that "serious statesmen" would for this reason decide on government ownership is to suppose the impossible. To compare the burden on the public of such a step, Mr. Acworth believes, with the alternative of allowing the existing companies to raise their rates by a small amount, which would make all the difference between poverty and affluence, would be almost "farcical." Thus speaks a man who knows.

MAKE IT A 100-PER CENT CAMPAIGN The present movement for higher fares on electric railways to compensate, in part, for increased cost of operation should not mean a cessation on their part, or on the part of the commissions, to introduce all possible economies which will not impair the service. A 6-cent fare instead of a 5-cent fare is equivalent to only a 20 per cent increase, and this is small compared with the increase in cost of many, if not most, of the factors which go to make up the cost of electric railway operation. Constant effort for economies, therefore, is just as necessary now as ever before. Indeed, it should be pressed even more vigorously. Skip stops, as introduced in Baltimore and elsewhere, will help some. There should be continuous effort to introduce one-man cars on those lines which are suitable for such service. Economies possible through schedule rearrangement and rerouting of cars should constantly be studied, as should all minor economies in railway operation. Railway companies have had more liberty of action with these minor economies and have paid so much attention to them during the past ten years that it is certain that only slight gains are possible there. But with conditions as they are, and as they promise to continue for some years, the 6-cent fare will have to be supplemented by every device and method toward economical operation and efficient service which is not only within the power of the companies to adopt but within the power of the communities to grant.

POPULAR BOND SUBSCRIPTIONS ARE NECESSARY We pointed out two weeks ago ways in which the electric railways could help in the sale of the Liberty Bonds. The size of the issue makes new methods of flotation necessary. Of course, as most if not all of the money raised by the loan will be spent here, the net financial effect in this country will be a redistribution of money rather than a loss of it. The chief problem is so to distribute the subscriptions that the strain will not fall too severely in any one place. This would be the case if the banks or those interested in large enterprises should take up the entire amount, as it would limit their ability to use their credit in necessary industrial and financial operations. But if the small investor participates, the load will be easily carried. And there is every reason why he should. If the war continues and other bond issues at a higher rate are necessary, the present bonds are convertible to those issued at the higher rate. On the other hand, if the war should come to an early close, the bonds will undoubtedly go to a considerable premium. In addition, there is the patriotic feeling which every subscriber will have, that he is helping his government to win the war. Many railways during the past week have entered subscriptions for these bonds and have offered them for resale to their employees on easy terms. This plan allows the men to pay for the bonds, wholly or in large part, out of future earnings.

EFFECT OF THE CONSCRIPTION ACT

Now that the conscription law has finally been passed by Congress it becomes possible to speculate on the approximate effect upon the electric railway industry. The age limits of twenty-one to thirty, inclusive, for those subject to registration for the draft include roughly one-third of the employees on the average electric railway, although on one large property the fraction is given as only one-fourth. Of these registrants, only part will be made subject to actual draft, the proportion depending both upon the relative number of exempted registrants among the electric railway employees (this covering men relieved because of physical and other defects and because of having dependents) and upon the ratio of the number of men engaged in exempted and in non-exempted occupations. The effect of the former factor may be nullified by assuming that the electric railways are similar to all other industries in regard to the proportion of men supporting dependents and in regard to the relative number of employees that are fit for military duty. This latter is not strictly true owing to the high physical standard required of railway men, but the assumption would properly apply if the physical requirements for the army were made low enough.

The other factor—that of the relative number of men employed and exempt in the industries throughout the country—is difficult to estimate. Agriculture and seafaring are the two principal industries "necessary to the maintenance of the military establishment, or the effective operation of the military forces, or the maintenance of the national interests" mentioned in the act as being causes for exemption, but this does not necessarily mean that all men nominally in these lines of work will be exempted. On the other hand, undoubtedly many now engaged in munitions manufacture, shipbuilding and certain other lines of work will be kept at their present employment. As the Census Bureau has estimated that agriculture, manufacturing, public service and mining occupy 64 per cent of the men within the military draft age limit and that the total number of registrants will be 10,000,000, approximately two-thirds may be exempted. There would then be left only 3,300,000 from which the first draft of a half million can be made. On this basis the first draft, which will come in September, must include 15 per cent of the registrants from the non-exempted industries, and if the electric railways are to be included in that category they must prepare to face a loss of at least 15 per cent of the registrants that they employ. Since the registrants, as before mentioned, constitute about one-third of the total number of electric railway employees, the loss will probably be not less than 5 per cent of the whole force and possibly more, depending largely upon the strictness of the army physical examination and the exemptions granted in other industries.

THE 6-CENT FARE MUST COME

The 6-cent fare movement is gathering momentum. It is true that in some cities, notably New York, the companies are seeking only to obtain the right to charge 2 cents for transfers. But the conditions in New York are radically different from those in most other cities. A charge for transfers will meet the need of the companies in New York, but it will not give the necessary relief in other cities.

That was a very interesting letter which President Shonts of the New York Railways Company wrote to Mayor Mitchel. The Mayor had suggested in a public statement that there was no reason why public utilities should be exempt from the sacrifices which had to be universally borne in such a national emergency as that now confronting the country. Mr. Shonts very properly pointed out, however, that not only were public utilities not exempt in any sense from the burdens of taxation, high cost of living, etc., which the entire community had to bear, but that so far the public utilities constituted practically the only industry which, because of public regulation, had not been permitted to adjust itself to the changed economic conditions which confronted it. Mr. Shonts added: "It has been the long continued practice of the United States government to charge 2 cents for letter postage, but in the current revenue bill it is proposed to increase the postage to 3 cents. The steel companies have heavy burdens, and they raise their prices. Bakers must pay more for their flour, and they raise the price of bread. The old-fashioned 'dollar' watch now sells for $1.35. The 5-cent package of biscuit now retails at 8 cents. The newspapers pay more for their paper, and there is a very general movement to increase the price of newspapers from 1 to 2 cents."

A number of the New York papers are urging that the 5-cent fare has been established so long as to have the sacredness of a public institution. That point of view is the only barrier to the sensible solution of this problem. As an economic proposition it is of course too absurd to argue, but as a political shiboleth it has undoubted importance. It is one of the most unfortunate facts of the situation that apparently it cannot be dealt with without reference to political considerations.

It is, however, undoubtedly true that if the rule of the 5-cent fare is to be regarded as inviolable, a great many states are going to be compelled to undertake municipal ownership whether they want it or not. When they do that, the deficit is likely to be passed on to the taxpayer, who will pass it on to the rent-payer, and eventually it will make the burden of the public heavier than ever. Certain it is that 6 cents worth of service cannot be given for 5 cents. Somebody has got to pay in the long run whatever the service costs. Municipal ownership would mean extravagance, corruption, and pork-barrel methods.

But this fact ought not to be forgotten: The American people are fair, even if they do want to be shown. Every company in the country should make it its business, without a moment's delay, to see to it that the public is shown exactly what the situation is now. It would be difficult to charge 6 cents for passengers in Rochester, N. Y., if people in Boston were riding for 5 cents. The state of the industry and the only prospect for a real development of the street railroading art rests upon raising the basis of street railway fares from 5 to 6 cents. Some companies will not need it. But such companies should offer to put the increased revenue into improving their service.

Every company in the country without delay should take steps to increase its fares. This act is justified by existing conditions and the prospects which confront us. It is an act primarily in the interest of the public service, because the public service is sure to suffer unless the companies can earn enough money to enable them to pay for a service of the highest quality. And such payment must involve not only adequate wages to employees and the market prices of commodities; it must include, as an indispensable charge, a fair return upon the capital invested.

COMMISSIONS AND UTILITIES ORGANIZE FOR NATIONAL DEFENSE

Public utilities throughout the country should follow the lead of those in New York City in forming a Committee on Public Service. Acting upon the initiative of Oscar S. Straus, chairman of the New York Public Service Commission of the First District—and in line with a suggestion made some time ago in the ELECTRIC RAILWAY JOURNAL—various street railroad companies, electric light companies and telephone companies have formed such an organization. It is unique in character and of great possibilities for usefulness. Commissioner Travis H. Whitney of the Public Service Commission is chairman of the executive committee, with Ivy L. Lee as secretary.

The scheme is to co-ordinate for effective service, during the war, all these various kinds of companies. One of the first problems considered has been that of co-operation with the Government to secure proper registration of all employees available for military duty. It will be necessary to secure the exemption of many such employees, but it has been felt that this problem should be considered by all of the utilities, so that, in the event of any of the companies suffering unusual hardship through the loss of men, the various companies could co-operate. Companies are to file with this executive committee a complete statement of all their facilities and materials on hand. This is to provide for emergencies. In case a power house or a plant of one of the companies should be blown up, for example, it is planned that the resources of the other companies will be immediately available to insure the continuous performance of the public service.

The executive committee is to meet once a week at the office of the Public Service Commission. These meetings are expected to bring about the suggestion and development of many plans not immediately related to operation of the individual companies. It has been suggested that each of the companies take steps at one of the early meetings to make it possible for their employees to subscribe, on easy terms, to the Liberty Loan.

It is believed that these weekly meetings, by bringing the leaders of the different companies together and encouraging the informal consideration of any matter which may come up, related to the welfare of the companies, their employees or the public they serve, will be of great helpfulness.

WE MUST STOP WASTING COAL

In a statement just issued to the press Francis S. Peabody, chairman of the National Coal Board, Council of National Defense, appeals to the people of the country to conserve the supply of fuel so that a sufficient quantity may be available for battleships, railroads, and munitions factories and all other enterprises that are making materials for use in the war. As large coal consumers the electric railways will take this appeal promptly to heart and plan for practical co-operation with the National Coal Board. Coal is to some extent wasted by electric railways both in generating electrical energy and in utilizing it. Incomplete combustion in the boiler furnace produces smoke and permits other combustibles to go up the chimney. Excess of air through the furnace also lowers economy. In the engine or turbine room waste goes on due to uneconomical loading of machinery and failure to maintain the best operating conditions of superheat, vacuum, etc. Electrical losses are probably not excessive on railway properties although they might be reduced in many cases, but after the energy gets to the car there is a splendid possibility of saving coal by wasting less energy in the brakeshoes. Cars can be operated with more coasting and, with the co-operation of the public, stops can be eliminated.

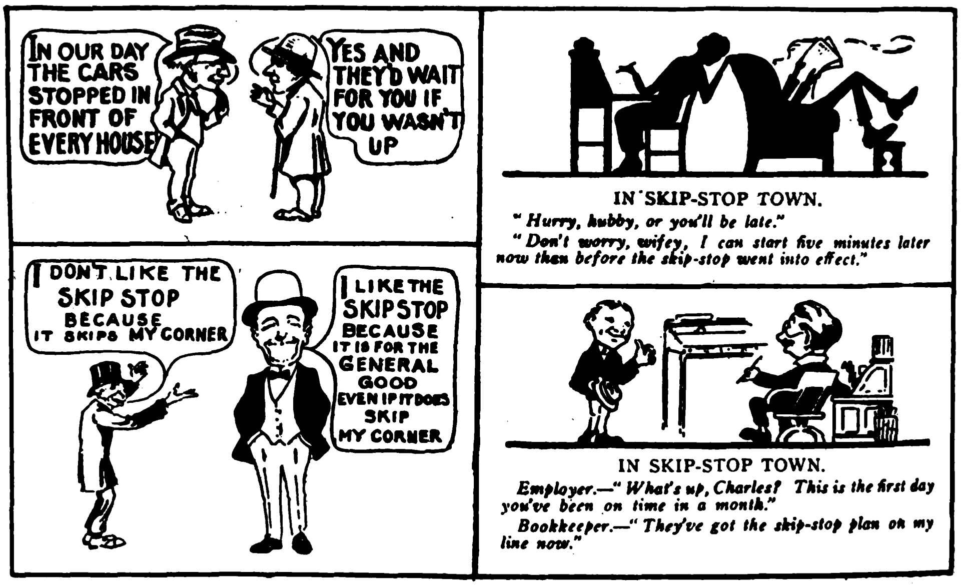
By careful attention to all possibilities in the line of energy, and therefore coal saving, any road which has not given the matter reasonable attention before could undoubtedly save from 10 to 20 per cent in the coal pile. Assuming that something like 9,000,000 tons of coal are used per annum in driving electric cars, a 10-per cent saving, or 900,000 tons, would furnish no small contribution toward the solution of the coal conservation problem. Then, too, electric railways purchase considerable energy from central stations. More economical car operation would reduce the amount of this, and the central station coal consumption could thus be reduced by possibly 500,000 tons. In the power plant we cannot expect yet to approach the ideal of 1 lb. of coal per kilowatt-hour referred to in a recent issue of the ELECTRIC RAILWAY JOURNAL, but we can certainly try for it. Neither can we expect to operate a car without wasting some energy in the brakeshoes, but we can certainly waste less than we have been doing.

Putting Across the Skip Stop in Baltimore

How the United Railways & Electric Company After Thorough Preparation Has Sold the Skip-Stop Plan to Some of Its Patrons on the Basis of Time-Saving—Reasoning Men Appreciate Its Advantages When Properly Explained

By DWIGHT BURROUGHS
Publicity Manager United Railways & Electric Company, Baltimore, Md.

IN its search for ways and means of bettering its service in Baltimore, the United Railways & Electric Company was impressed with the practicability of the skip-stop method of operation in certain other cities. The company decided, therefore, that this was worthy of consideration with a view of determining its applicability to the local car lines. It had in mind from the first, however, the question as to whether the people of the community would want the skip stop, even though better and more modern service should result.


IN OUR DAY THE CARS STOPPED IN FRONT OF EVERY HOUSE
YES AND THEY'D WAIT FOR YOU IF YOU WASN'T UP
I DON'T LIKE THE SKIP STOP BECAUSE IT SKIPS MY CORNER
I LIKE THE SKIPSTOP BECAUSE IT IS FOR THE GENERAL GOOD EVEN IF IT DOES SKIP MY CORNER

IN SKIP-STOP TOWN.

"Hurry, hubby, or you'll be late."

"Don't worry, wifey, I can start five minutes later now than before the skip-stop went into effect."

IN SKIP-STOP TOWN.

Employer.—"What's up, Charles? This is the first day you've been on time in a month."

Bookkeeper.—"They've got the skip-stop plan on my line now."

SKIP-STOP PUBLICITY—HOW THE CARTOONIST IN "TROLLEY NEWS" DROVE POINTS HOME

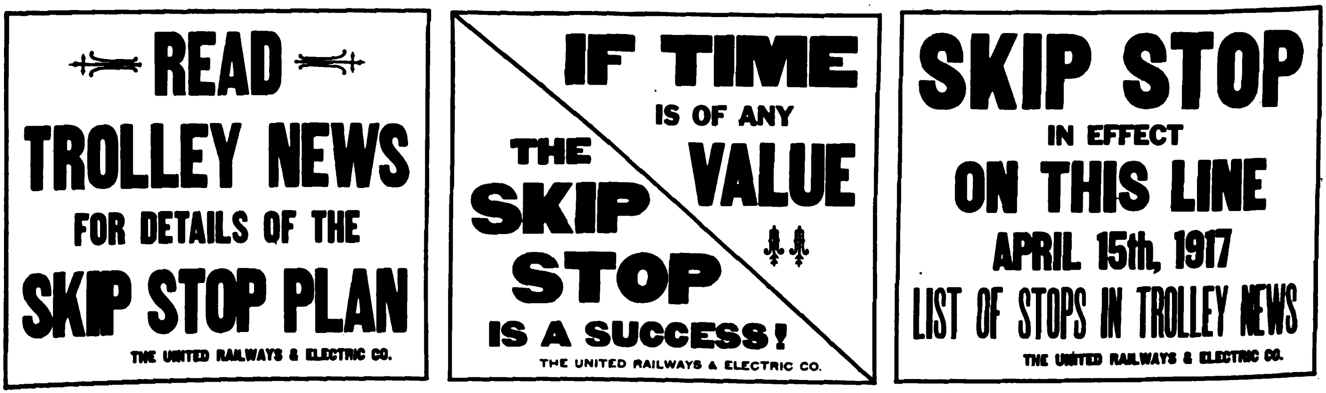
CONSERVATISM TO BE OVERCOME

Baltimoreans are known for their conservatism. Almost sixty years ago the proposition to establish a line of horse cars in the city met with such strenuous opposition from the merchants of the principal thoroughfare that the asked-for privilege of laying tracks was not granted. Many years later, when electricity was introduced on the city lines, this method of car propulsion met with opposition, and one of the foremost citizens denounced the electric cars as "roaring, rattling, screeching juggernauts." Moreover, at some points there was opposition to the substitution of smooth pavements for the time-honored cobblestones with which the streets were paved.

Hence, in deciding to study the advantages of the skip stop, the United Railways & Electric Company decided likewise to feel the public pulse. To do this fairly it was deemed necessary to inform the public thoroughly of the nature of the skip-stop method of operation by placing in its possession all relevant data and information that the company could amass.

STUDYING UP ON THE SUBJECT

To serve these ends there was undertaken what was probably a much more thorough investigation of the skip-stop method than had been carried on anywhere else. All the resources of the company were employed to secure the very latest data concerning the working of the plan elsewhere. The American Electric Railway Association on request supplied all the information it had in its very extensive files relative to the experience of other cities. This information was very carefully digested, the principal features charted and all figures tabulated.



READ
TROLLEY NEWS
FOR DETAILS OF THE
SKIP STOP PLAN
THE UNITED RAILWAYS & ELECTRIC CO.

Card Placed in All Cars of System Ten Days Before Skip-Stop Plan Became Effective, and Left There for a Week After the Plan Went Into Operation

IF TIME
IS OF ANY
VALUE
THE
SKIP
STOP
IS A SUCCESS!
THE UNITED RAILWAYS & ELECTRIC CO.

Card Placed in Cars Two Weeks After Skip-Stop Plan Became Effective

SKIP STOP
IN EFFECT
ON THIS LINE
APRIL 15th, 1917
LIST OF STOPS IN TROLLEY NEWS
THE UNITED RAILWAYS & ELECTRIC CO.

Card Placed in All Cars of North Avenue and Edmondson Avenue Lines a Week Before the Skip-Stop Plan Went Into Operation in Baltimore

SKIP-STOP PUBLICITY—CAR CARDS USED TO ATTRACT PATRONS' ATTENTION TO THE SKIP-STOP PLAN

Representatives of the company were sent to various skip-stop cities to make a first-hand inspection of the mode and the success of operation, and to determine which of the features could properly be applied to Baltimore. At the same time a general survey was made of several lines in Baltimore to ascertain the practicability of the skip stop on them.

The result of this painstaking work was that all the good points of the several systems used elsewhere were adopted. Those features which it was felt had detracted from the success of the idea in other cities were discarded. Local conditions in Baltimore were always borne in mind, and an effort was made throughout to cater to the greatest convenience of the public.

BROACHING THE TOPIC

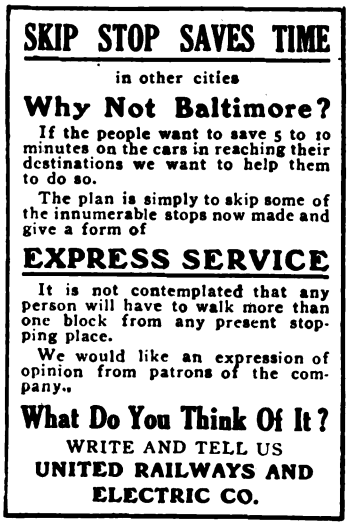
Satisfied after this study that the plan could be advantageously adopted in Baltimore, and that the people would be much benefited by its adoption, it was decided to present the entire plan to the people themselves and to invite them to decide whether they wanted a more progressive method of railway operation.

Before any announcement was made that the company had the adoption of the plan in view, however, the successful operation of the system in other cities was described in a brief article in the company's car pamphlet, *Trolley News*. This first article, which was entitled "Skip-Stop Plan—It Seems to Be Solving Difficulties," appeared on Feb. 1. The next issue, dated Feb. 16, contained a short article on "Value of Time—How the Public Can Help Save It." In this there was an illustration of a mule-drawn car and this comment: "'When You and I Were Young, Maggie,' this car stopped anywhere for us." The tenor of the article was that just as people outgrew the stop-in-the-middle-of-the-block horse car, so they have now progressed to a point where they could consider the stop-at-every-corner plan obsolete.

Thus the skip-stop idea was first suggested to the people in a casual manner, in order to interest them and have them discuss it as a possibility before the company unfolded any plan. In this way the company erected a firm foundation for the work that was to follow.

ASKING THE OPINION OF THE PEOPLE

Then came inquiries from the newspapers as to whether the company was seriously considering the skip stop. The company said that it was, and that it would like to know what the people thought of it. To secure this information the accompanying advertisement, emphasizing the time-saving under the skip-stop plan and asking for an expression of opinion from patrons, was published on the front page of every newspaper in Baltimore.



SKIP STOP SAVES TIME

in other cities

Why Not Baltimore?

If the people want to save 5 to 10 minutes on the cars in reaching their destinations we want to help them to do so.

The plan is simply to skip some of the innumerable stops now made and give a form of

EXPRESS SERVICE

It is not contemplated that any person will have to walk more than one block from any present stopping place.

We would like an expression of opinion from patrons of the company.

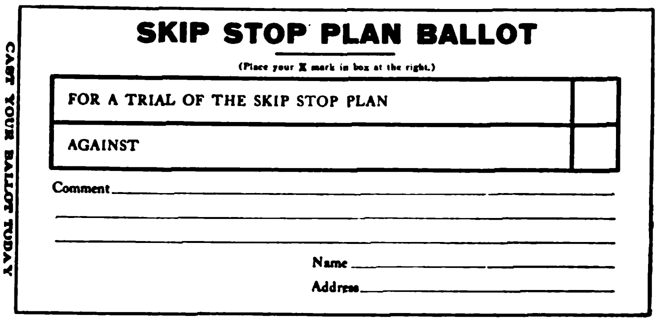
What Do You Think Of It?

WRITE AND TELL US
UNITED RAILWAYS AND ELECTRIC CO.

SKIP-STOP PUBLICITY — NEWSPAPER ADVERTISEMENT ASKING OPINION OF PATRONS

A great many letters were received in reply to the advertisement. Some persons objected to the plan, but they were in the minority. Nine out of ten writers heartily approved. Some were very enthusiastic, and urged that the skip stop be adopted as soon as possible. On March 16 the company published in *Trolley News* an article entitled: "Skip Stop for Quicker Service—Many Are in Favor of Trying the Plan." This was accompanied by the reproduction of about two dozen of commendatory letters.

To aid in securing the opinion of patrons, the company distributed card ballots, as reproduced herewith, at the meetings of various organizations of business men. In a short time the skip-stop plan had been indorsed by the City Club, the Rotary Club, the Advertising Club, the Northeast Baltimore Improvement Association, the East Arlington Improvement Association, the North Baltimore Improvement Association, the Confederated Improvement Associations of Baltimore County, the Woodlawn Improvement Association, the Hamilton Improvement Association and various others.



CAST YOUR BALLOT TODAY

SKIP STOP PLAN BALLOT

(Place your X mark in box at the right.)

FOR A TRIAL OF THE SKIP STOP PLAN	☐
AGAINST	☐

Comment ____________________

Name ____________________

Address ____________________

SKIP-STOP PUBLICITY—CARD BALLOT DISTRIBUTED AT MEETINGS OF BUSINESS MEN

The vote of the City Club, taken at one of its luncheons, resulted as follows: For skip stop, 161; against, 16. The vote of the Rotary Club was: For, 78; against, 3. The vote of the Advertising Club was: For, 73; against, 0. Representatives of the company visited some of the organizations and explained the skip-stop plan personally to the members. This personal touch helped greatly to foster a kindly feeling toward the innovation.

The public appeared to be very much interested by this time, and it was thought advisable to issue a "skip-stop catechism." Accordingly on April 1 200,000 four-page pamphlets, one of which is reproduced on page 995, were distributed in the company's cars and by other means. This pamphlet, entitled "The Skip-Stop Plan of Street Railway Operation," endeavored in a series of questions and answers to cover every possible point which might arise in the public's mind relative to the skip-stop method of operation. The general idea of the whole scheme of publicity was that "the cards should be laid on the table face up," so that every one would be perfectly acquainted with what the company proposed to do.

PREPARING FOR A TRIAL OF THE PLAN

Having issued this catechism and having learned the sentiment of the community as expressed in letters and by ballots, the company felt it was not only justified in, but definitely committed to, making a trial of the skip stop in Baltimore.

A preliminary general survey of certain lines was followed by a thorough survey to establish skip stops, and it was decided to put the plan into effect on the North Avenue and the Edmondson Avenue lines. Immediately this was announced in *Trolley News* and in the newspapers by advertisement and news articles.

It should be stated that the selection of the two lines named was due largely to the fact that they serve both city and country, one of them passing very close to the business center of the city and actually through the retail shopping district. No stops were eliminated in the business section.

There was a great deal of detail work to be done, including the marking of poles to show stopping places and non-stopping places. This in itself required a small army of painters, as it was necessary to do this within a very few days in order that there should be no confusion in the public's mind concerning the date upon which the plan was to go into effect.

In announcing April 15 as the date of beginning skip-stop operation, much literature was prepared and distributed in the cars. The following announcement was published in *Trolley News:*

> On Sunday, April 15, Baltimore will have its introduction to the modern skip-stop method of street railway operation, which has been found to work so successfully to the public's good in other large cities.
>
> The effect of the skip stop is to save time for the riding public. To-day, as never before, time is valuable. The saving of five minutes on a trip is of great importance. Wherever there has been progress it has been with the aid of saved minutes.
>
> Saved minutes on each car's run enable that car in the course of a day to make other runs, so the public gets better service as well as faster service.
>
> The lines upon which the plan goes into effect April 15 are the Edmondson Avenue and the North Avenue lines. The company asks the public to give the plan a fair and unprejudiced trial. The stopping places have been selected with a great deal of care that they might be those that would best cater to the public convenience.
>
> The man who has to walk a block farther than heretofore should not lose sight of the fact that he is even then saving many minutes on his trip to his destination.
>
> Poles nearest the present stopping places all along the two lines have been marked. Those at which the stops are retained are painted "CAR STOP."
>
> Since all stops are to be retained in the down-town district it has not been necessary to mark any poles.
>
> Those which are skipped are painted "NO CAR STOPS."
>
> Watch for the white painted poles with the black lettering and there need be no confusion.

SKIP-STOP PLAN

Will Be In Effect On

EDMONDSON AVENUE & NORTH AVE. Lines

Sunday, April 15, and Thereafter

List of stops and non-stops will be printed in this paper Saturday, April 14, and in TROLLEY NEWS.

The Company bespeaks the co-operation of the Public in making a success of this plan for better and quicker service, and asks that it be given a fair and unprejudiced trial.

United Railways & Electric Co.

SKIP-STOP PUBLICITY — NEWSPAPER ADVERTISEMENT ANNOUNCING TRIAL OF PLAN

The same issue of *Trolley News* contained a list of the stops and non-stops on the two lines, and the little folder concluded with this significant suggestion: "The biggest factor in making this movement for quicker and better service successful will be the co-operation and assistance of the progressive public-spirited citizens of this community."

The advertisement shown above was printed in all the daily papers for several days before the beginning of skip-stop operation. Large cards bearing a similar announcement were posted in the cars of the whole system. Other car cards that were used are shown in the illustration on page 992. Besides those reproduced, there were similar cards used on the cars of lines interlacing the two skip-stop lines for short distances.

On the day before the plan was put into operation the company advertised the entire list of stops and non-stops on the front pages of all the local newspapers.

Then the skip-stop plan went on trial.

ONLY OPPOSITION WAS SELFISH

The company awaited the riding public's verdict. It felt that it had exhausted every effort to acquaint its patrons fully with the plan and its purposes, and it was extremely gratified at the favorable expressions of opinion that had followed the suggestion of the idea. But how would the people take the skip stop in actual practice?

Several days passed and only favorable comment was heard. Patrons of the lines spoke in the most glowing terms of the bettered service, and persons using other lines asked that skip stop be applied to these.

As expected, however, some objection was soon raised. Many letters were sent to the company, and many to the Public Service Commission, and still others to the newspapers, "roasting" the skip stop. The company was charged with sins conceivable and inconceivable. Its motives were assailed and its integrity questioned.

The basis of the complaints? In almost every case it was the fact that the writer objected to walking one block to get his car. Out of 174 objecting persons 122 indicated that they were not opposed to the skip-stop principle, but seriously resented "their" corner being skipped. Almost every one of these suggested, either directly or by inference, that he would accord the plan his support if his corner was restored as a stop and the other fellow's corner, a block away, was cut out.

Quicker Service
Better Service

North Ave. Line

	Woodlawn-Washington St.	Walbrook-Milton Ave
Former running time, round trip.......	102 Min.	70 Min.
Skip-Stop time.....	90 Min.	60 Min.
Saving in time...	12 Min.	10 Min.

Edmondson Ave. Line

	Electric Pk. to Luzerne St.	Windsor Hills to Loney's Lane
Former running time, round trip.......	120 Min.	108 Min.
Skip-Stop time....	106 Min.	96 Min.
Saving in time...	14 Min.	12 Min.

On a round trip from Electric Park to Charles and Saratoga Streets there is A SAVING OF 10 MINUTES.

On a round trip from Liberty Heights Avenue to Charles Street and North Avenue, there is A SAVING OF 8 MINUTES.

SKIP STOP
A SUCCESS

SKIP-STOP PUBLICITY — ADVERTISEMENT USED THREE DAYS AFTER OPERATION BEGAN

CONTINUING THE PUBLICITY WORK

In the meantime the company's publicity work was continuing. During these days the management endeavored to show by figures and statements based on actual operating results how the public was being benefited by the skip-stop operation on the two lines.

Three days after the plan became effective the accompanying advertisement was used to show the time saving under skip-stop operation. Cards giving the same figures were placed in the cars, and after these the general card shown in the middle of the group on page 992 was used.

At intervals of two or three days other advertisements were used. One of the first of this series, for example, included the following introduction:

> *MILLIONS OF MINUTES SAVED*
>
> The skip-stop method of street railway operation has been in effect on the North and Edmondson Avenue lines of the United Railways eight days. It has proved successful in giving the patrons of the two lines a quicker and a better service, and these patrons have signified in letters to the company, in telephone messages and in personal conversation their hearty approval of the new and improved running schedules.
>
> On these two lines approximately 125,000 persons are carried every day, so that in eight days about one million passengers have enjoyed the benefits of the skip-stop plan. Millions of minutes of valuable time has been saved them.

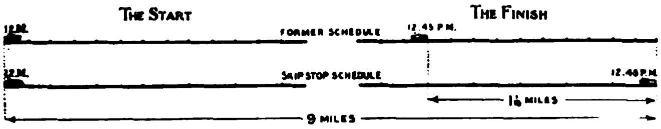
Then came advertisements headed: "People Approve —Its Advantages Are Obvious," etc. A brief introduction sufficed for each of these, the body of the advertisement being letters of commendation received by the company.

How "Trolley News" Summarized the Results

Two weeks after the plan went into effect *Trolley News* contained an article on "What Has the Skip Stop Accomplished?" This contained the following statement:

> Baltimoreans have had an opportunity to see the skip stop in actual operation for two weeks.
>
> In this period about two million passengers have been carried on the two lines. There have been a few objections, but the number of persons who are pleased by the quicker and better service seem far to outweigh those who have not yet come to a realization of the benefits of the plan, but who at present object because they are personally inconvenienced by having to walk a block.
>
> Of the many who are heartily in favor of the skip-stop plan a considerable number have written the company commending the improved service and testifying to the good results it has accomplished.
>
> Patrons of the line who have benefited by the change in the system of operation declare they would consider it a real hardship to return to the old method through which much more time was consumed in journeying from point to point.

This issue of *Trolley News* also contained an illustration graphically portraying the advantage of the skip stop. With its accompanying explanation it is reproduced herewith.

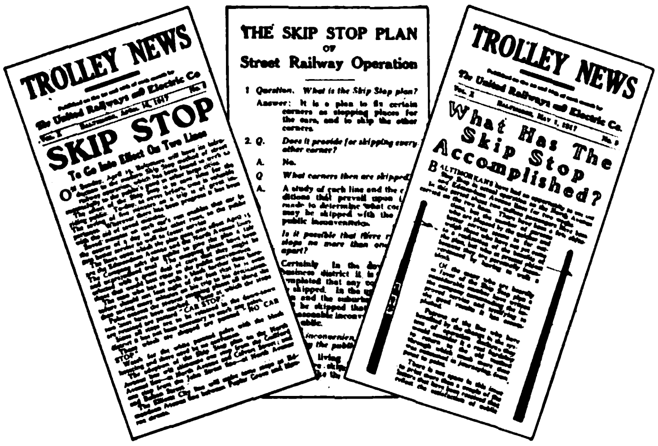


SKIP-STOP PUBLICITY—"TROLLEY NEWS" GRAPHIC REPRESENTATION OF TIME SAVING

> The accompanying illustration very graphically presents the saving of time by the skip-stop plan.
>
> Here are shown cars leaving a terminal under the old schedule and under the new skip stop.
>
> They start at the same hour, noon, and have to run the same distance, nine miles.
>
> At 12.45 the skip-stop car has reached its destination.
>
> At 12.45 the old schedule car has still more than a mile to run to its destination. It will be six minutes later before it reaches the point at which the skip-stop car has already completed the run.

Public Is Better Served

Since Baltimore has been trying the skip stop, representatives of the United Railways & Electric Company have visited many organizations which were interested in the subject, and have explained the plan and answered questions concerning it. The attitude of some of these organizations was not altogether favorable at the beginning, but it has been found that when the matter was properly presented to a body of reasoning men the chances were largely in favor of their appreciating the advantages of the plan, and of our winning their indorsement and support.



TROLLEY NEWS
The United Railways and Electric Co
SKIP STOP
To Go Into Effect On Two Lines

THE SKIP STOP PLAN
OF
Street Railway Operation

1 *Question. What is the Skip Stop plan?*
Answer: It is a plan to fix certain corners as stopping places for the cars, and to skip the other corners.
2 Q. *Does it provide for skipping every other corner?*
A. No.

TROLLEY NEWS
The United Railways and Electric Co.
What Has The Skip Stop Accomplished?

SKIP-STOP PUBLICITY—EXAMPLES SHOWING HOW "TROLLEY NEWS" HELPED TO EDUCATE THE PUBLIC—IN THE CENTER IS THE SKIP-STOP CATECHISM

Briefly summarized, the advantages of skip-stop operation are manifest through a perusal of the advertisement printed on page 994, which shows the saving of time. Forty-five more round trips per day are being made on the two lines, with an added mileage exceeding 500 miles. And with this our figures show there is a saving in cost of operation.

It has been proved that the public is better served, and that while giving a better and a quicker service the company can save its energy and equipment.

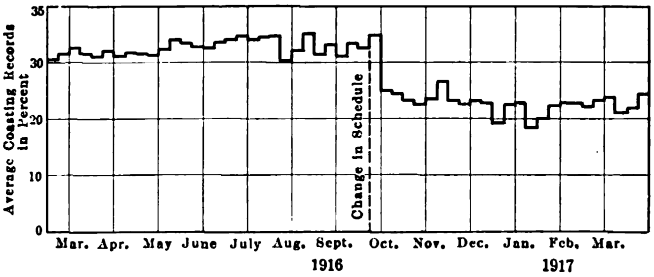
Whether or not the skip stop, which the United Railways & Electric Company regards as a distinct advance in modern railway operation, is to be a permanency in Baltimore, it is felt that the company has presented a trial to the people under the fairest terms possible.

Coasting Recorders at Fort Worth

Point the Way to Higher Schedule Speed—Five Cars Do the Work of Six

ALTHOUGH coasting is usually considered chiefly from the economies it effects in energy and brakeshoes, intelligent analysis of the coasting records can lead to still greater benefits. A recent example is afforded by the Northern Texas Traction Company, which has all of its cars equipped with Rico coasting recorders.

This company operates in Fort Worth the Polytechnic-Belknap line, whose round trip length is 12.28 miles. The headway is fifteen minutes. In analyzing the coasting records, it was observed that the average performance of all men was about 33 per cent and the maximum above 35 per cent. Roadway conditions were such that some of this slack in the line could be taken up by using a higher schedule speed to such advantage that one of the six cars could be eliminated.



COASTING PERCENTAGES ON POLYTECHNIC-BELKNAP LINE BEFORE AND AFTER SCHEDULE SPEED WAS INCREASED

The change was made on Oct. 1, 1916, the schedule speed being raised from 8.19 m.p.h. to 9.82 m.p.h., or 16 2/3 per cent. This cut the round trip running time from ninety minutes down to seventy-five minutes, or seven and a half minutes each way.

Thus the company not only gets five cars to do the work of six, but also makes travel more attractive. While the coasting percentage now ranges from 24 per cent average to 26 per cent maximum, the actual energy and brakeshoe savings will probably be greater since there are only five cars to run instead of six.

The E. H. Harriman memorial medals have been awarded by the American Museum of Safety as follows: The gold medal to the Alabama Great Southern Railway, Cincinnati, Ohio; the silver replica to the Illinois division of the Illinois Central Railway, Chicago, Ill.; and the bronze replica to James A. McCrea, general manager Long Island Railroad, New York, N. Y.

New Kansas Interurban Line Serves Central Cities

Arkansas Valley Interurban Railway, Connecting Wichita, Hutchinson and Newton, Forms Central Section of Contemplated Extensive System

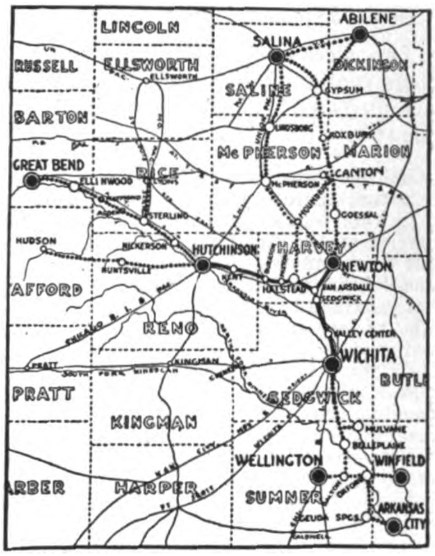
THE final section of an interurban line, connecting Wichita, Newton and Hutchinson in the central part of Kansas, was completed last year and through service has been inaugurated between these points. The property comprises at present a total of 62.8 miles of electric railway, serving an unusually rich section of the Arkansas River Valley. At the Hutchinson end of the line there is a population of 20,000, and enormous salt production, soda ash manufacturing and flour mill industries. At Wichita, the present south terminus of the line, the milling, packing and stockyard industries flourish and there is here a population of 70,000. The first section was built from Wichita to Halstead, a town of only 2500 population, and the following year the branch into Newton, a town of 8000 inhabitants, was completed. The final construction was the section from Halstead to Hutchinson. When this began operation the passenger traffic increased 100 per cent almost immediately and the earnings reached an amount for the first time which left some surplus above operating expenses.

OPERATING FIGURES SHOWING EFFECT OF COMPLETION OF LINE INTO HUTCHINSON IN 1916

	1912	1913	1914	1915	1916
Gross earnings	$136,442	$132,546	$137,454	$140,261	$271,107
Operating expense ...	86,702	79,756	79,612	82,150	140,684
Net earnings	$49,740	$52,790	$57,842	$58,111	$130,423
Interest and taxes...	47,965	53,553	58,387	59,691	83,222
Net revenue	*$1,775	*$763	*$545	*$1,580	$47,201

*Loss.

Further extensions of the system are definitely contemplated, and President George Theis, Jr., states that the proposed extension to the north to the cities of Salina and Abilene will be constructed just as soon as materials prices return to somewhere near normal. Later extensions to the south and west are contemplated, looking toward a comprehensive system to serve the agricultural, manufacturing and oil industries of this rich section.

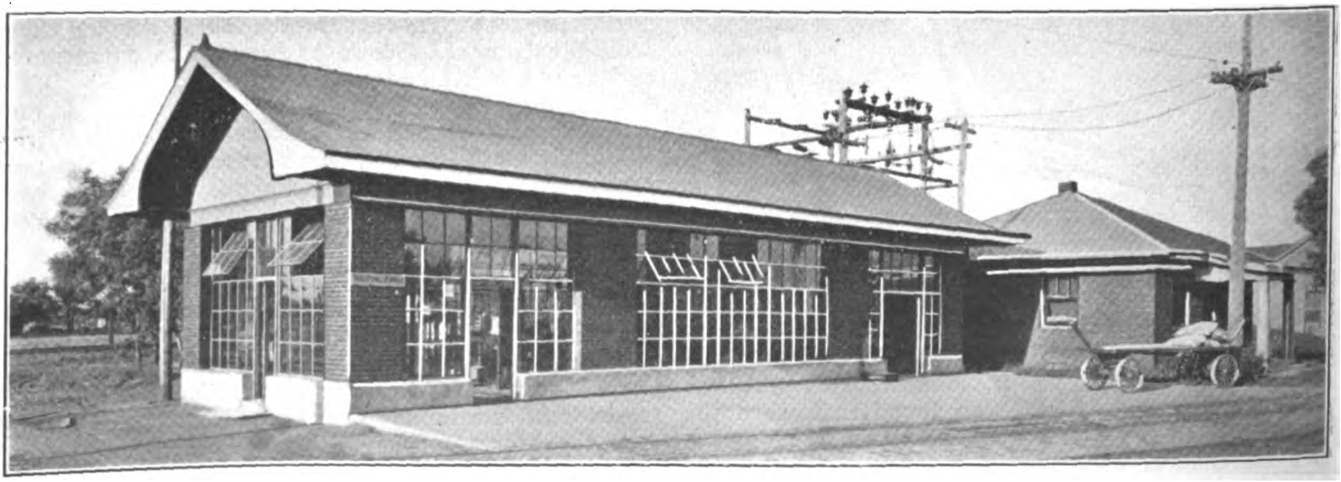


▬ Interurban lines now operating and under construction.
······· Interurban lines proposed.
—— Railroads.

NEW KANSAS INTERURBAN—MAP OF PRESENT AND PROJECTED LINES

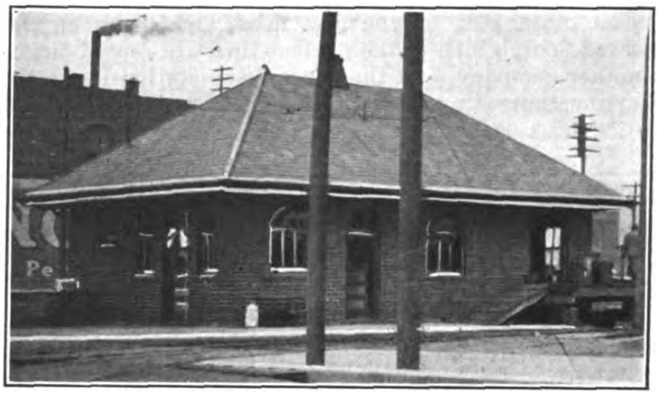
Owing to the level character of the country through which the line runs very little difficulty was encountered in its construction. It is on a private right-of-way, varying in width from 66 ft. to 100 ft., with a roadbed 16 ft. wide on top and sloping ½ in 1 on fills and 1 in 1 in cuts. The maximum curvature on private right-of-way is 6 deg., and the maximum grade of 1½ per cent is encountered at an overhead crossing with the Santa Fé Railroad near Newton. The maximum curvature on the newer Hutchinson end of the line is 2 deg. The rail on this end of the line is 80-lb. and 85-lb. A. S. C. E., while that on the older section at the Wichita end is 70 lb. At present approximately 20 miles of the line is ballasted with 6 in. to 10 in. of gravel ballast from a pit on the company's right-of-way, but the entire line is well ditched on either side of the track so that there is excellent drainage and the track has remained in unusually good condition for non-ballasted road. The rails are laid principally on 8-ft. x 6-in. x 7½-in. oak ties and the joints are bonded with No. 0000 twin-terminal bonds in open track and crown bonds in the city streets. Cross-bonding between rails is installed at all lightning arresters. These arresters are of the Garton-Daniels type installed every 990 ft. on the overhead pole. Duquesne rail joints were used on the Hutchinson end of the line, while angle bars were used on the earlier construction.

Temporary wood structures were installed in the original construction work, but are being replaced as rapidly as possible with permanent concrete bridges.



NEW KANSAS INTERURBAN—BURTON DAYLIGHT SUBSTATION

NEW KANSAS INTERURBAN—HUTCHINSON TERMINAL STATION



NEW KANSAS INTERURBAN—NEWTON TERMINAL STATION

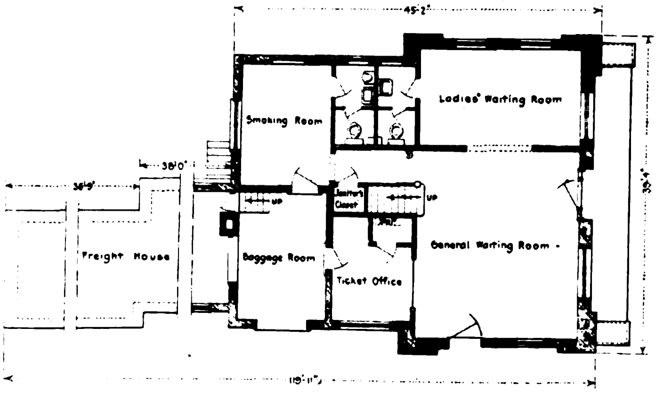
Ten of these have already been completed and the abutments for four more installed. This will leave only four wood trestles on the entire property. The longest concrete bridge, shown in an accompanying photograph, is 240 ft. long. There are two trestles 230 ft. in length which probably will not be replaced this summer.

OVERHEAD CONSTRUCTION AND POWER SUPPLY

Energy for the operation of the line is purchased entirely from the Kansas Gas & Electric Company at Wichita, except for 7½ miles out of Hutchinson, where the supply is direct current without transformation from the power plant of the United Water, Gas & Electric Company in Hutchinson. There has been constructed a 66,000-volt, 60-cycle, three-phase line along the right-of-way to supply the three railway substations, one at Valley Center, 10 miles from the Wichita power house, the second at Van Arsdale Junction, 13.5 miles beyond the first, and the third at Burrton, 14 miles beyond the second. The electric company maintains its line and sells energy to the railway company metered on the 2300-volt side of the transformers in the substations.

The high-tension circuit of the electric company is carried on Idaho red cedar poles adjacent to the tracks, and the brackets for the railway overhead construction are mounted on these same poles. The No. 0000 trolley is paralleled over much of the line by one or two No. 0000 feeder cables which are carried on the lower crossarms on the high-tension poles. The railway company's telephone circuits are also installed on these crossarms. The overhead fittings and insulators are of Ohio Brass Company manufacture throughout. From Halstead west the trolley is insulated for a pressure of 1200 volts, looking toward the ultimate operation of the entire system at this voltage instead of 600.

The Valley Center and Van Arsdale Junction substations are equipped with Allis-Chalmers motor-generator sets, with one 200-kw. unit and one 300-kw. unit in the former and two 300-kw. machines in the latter. These substations are of the usual type of construction. Living quarters are provided on the second floor for the station operator and family, and outdoor high-tension switching equipment is used. The newer Burrton substation on the Hutchinson section of the line is rather unusual, its construction being almost entirely of glass.

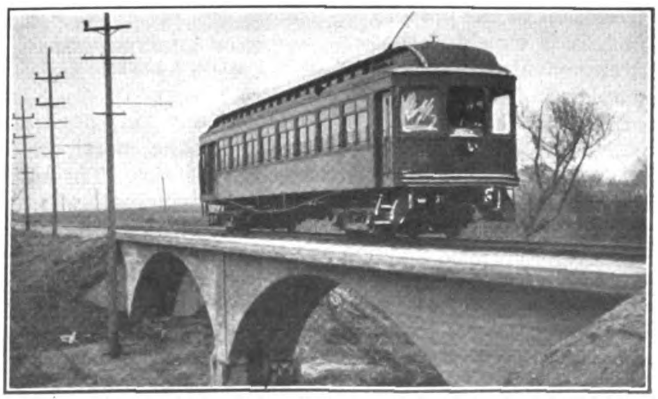


NEW KANSAS INTERURBAN—FLOOR PLAN OF HUTCHINSON STATION

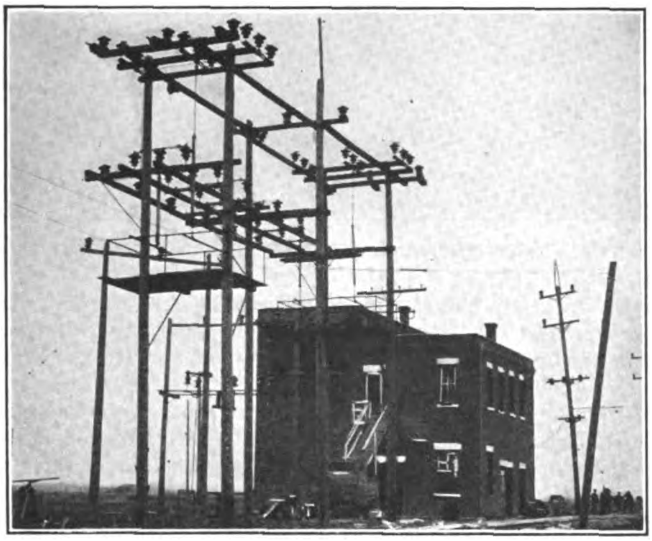
This is called a "daylight-type" substation. In this case a four-room cottage at the rear is furnished for the use of the operator and his family. The front end of the substation is partitioned off to make a waiting room for passengers. This substation is equipped with one 200-kw. and one 300-kw. General Electric motor-generator sets, and the high-tension switching apparatus, also of the outdoor type, is installed at the rear of the substation.

An unusually attractive terminal station in Hutchinson has recently been completed. This is a two-story dark red tapestry brick building with waiting rooms

NEW KANSAS INTERURBAN—FREIGHT AND GENERAL OFFICE BUILDING AT WICHITA



NEW KANSAS INTERURBAN—TYPICAL CONCRETE BRIDGE AND PASSENGER CAR for men and women, baggage room, smoking room, ticket office, etc., on the first floor, and offices on the second floor, which at the present time are rented out to another company. At the rear of the station is a long, narrow express and freight shed, which is constructed with brick columns and with the sides closed off by seven Kinnear rolling steel doors on either side, and one at the extreme end. This long, narrow platform, with the cars on one side and teamway on the other, makes possible the handling of freight and express with a minimum of labor.



NEW KANSAS INTERURBAN—VAN ARSDALE JUNCTION SUB-STATION AND OUTDOOR SWITCHING EQUIPMENT

Two types of small shelters have been erected at the principal cross-road stops along the line. In one of these the partitions are placed in a right-angle cross and set at an angle of 45 deg. to the track. These are constructed of wood with shingle roof and cost approximately $70 each. The other type of shelter used is built in the form of an H, with seats installed on either side of the crossbar. These were also made of single-board partitions with shingle roof and erected at a cost of $30 each.

NEW KANSAS INTERURBAN — TYPE OF SHELTER USED ALONG LINES

TRAFFIC POSSIBILITIES

The property is equipped with various freight and express cars for handling l.c.l. and carload business. While this is not developed to any extent at the present time, it is expected that arrangements will be completed in the near future which will place the company in position to haul a considerable quantity of the north and south freight movement through this district. Through its connections the line taps the principal wheat-producing territories of the State, which in 1914 raised and shipped 335,000,000 bu. of wheat. The flour mills of Wichita produced 1,750,000 bbl. of flour last year, and more than 50,000,000 lb. of salt were shipped from the State of Kansas in 1916, more than from any other state in the Union. Some of the carload freight from the soda-ash manufacturing plants at Hutchinson, which is one of the largest in the country is also expected to move in a southerly direction over the electric line. Franchise rights have been secured for a private right-of-way entrance into Wichita, which will cut down the running time within the city from ten to fourteen minutes, and also make possible certain interchange connections with steam railroads and provide for the hauling of carload freight.

Fare Case to Be Reopened

Bay State Street Railway Is Compelled by Rapidly-Increasing Costs to Ask Further Relief Before End of Trial Period

Seeking the reopening of its fare case on behalf of the establishment of a 6-cent unit throughout its entire system, the Bay State Street Railway appeared before the Massachusetts Public Service Commission on May 25. S. H. Pillsbury and S. E. Wardwell represented the company, and a numerous array of counsel registered on behalf of municipalities in the company's territory. Features of the hearing were the testimony of C. R. Rockwell, treasurer; H. F. Fritch, statistician, and R. S. Goff, vice-president and general manager, bearing upon the company's imperative need of additional revenue. As the result of the testimony presented, the commission has decided to reopen the case.

In opening the case, Mr. Pillsbury stated that since the rate decision on Aug. 31, 1916, which in general authorized a 6-cent fare on country but not on city lines, the company had done its best to put into effect the recommendations of the board with respect to securing greater economy of operation, as far as this could be effected without additional capital expenditure. Special attention had been given to the recommendations in the report of B. J. Arnold to the commission pointing out ways in which further economies might be attained. Rapidly-increasing costs, however, averaging more than 66 per cent in representative materials since 1914, the burdens of higher wages and poor credit had led the company to ask for a reopening, despite the intimation of the board in the 1916 finding that such action would not be taken until a year's trial of the rates then authorized had been made.

Mr. Rockwell said that the company is now in a position where it cannot market new securities, a 6 per cent $2,000,000 note issue having failed in December, 1916. In the year ended June 30, 1916, the net operating revenue decreased 15.97 per cent as compared with 1914, and for the nine months ended March 31, 1917, it decreased 19.64 per cent from the net of the corresponding period in 1914. The year 1914 was the one whose figures were used by the commission as the basis for its decision in the rate case of 1916. The 1916 operating expenses were 14.16 per cent greater than in 1914, and for the nine months' period ended March 31, 1917, they were 27.04 per cent greater than for the corresponding 1914 period. Gross earnings increased but 3.97 per cent in 1916 over 1914, and 11.9 per cent in the 1917 nine months' period. Net income was 37.68 per cent less in 1916 and 52.86 per cent less in 1917, compared with 1914.

The witness then introduced the table on page 999 showing the increased cost of about thirty important items of material used by the equipment, operating, line and track departments since 1914. The table shows the approximate average annual consumption of each class of materials used, the total costs being those figured upon the assumption that the company had purchased these average amounts in the periods named. Other items not listed, according to the company's purchasing agent, show about the same general run of increases, the tabulated items being typical and not specially selected to emphasize the rising costs.

Mr. Rockwell said that the increase in wages since Sept. 30, 1914, was due to an arbitration award effective from Oct. 1, 1914, to Sept. 30, 1916, and to a working agreement dated Oct. 1, 1916, and running to May 1, 1920, with successive increases between those dates. The total additional wage cost from Oct. 1, 1914, to May 1, 1917, over the 1914 rates, if no allowance is made for increased service, was $855,600. The increased cost per year, after May 2 last, with no allowance for increased service, compared with 1914, is $768,000. Touching upon the coal situation, Mr. Rockwell said that the advantageous contracts of the company are now expiring. About 20,000 tons are on hand, or one-eighth of the year's requirement. The recent and prospective coal cost of the company, which calls for more than double the outlay of 1917 for 1918, is shown below for the years ended June 30, 1914, to 1918:

1914, at $3.70 per ton	$601,000
1915, at 3.55 per ton	583,000
1916, at 3.80 per ton	618,000
1917, at 4.55 per ton	728,000
1918 (estimate)	
35,000 tons, at $7.50 per ton	$262,000
125,000 tons, at $10 per ton	1,250,000
160,000 tons	$1,512,000

Mr. Fritch stated that since the decision of the commission last summer a complete traffic study had been made for the entire system. About 25 per cent of the stops had been eliminated. In some cases service had been curtailed along lines suggested by the board, and about $90,000 per year was being saved in this way. The recommended changes, however, which call for capital outlay had been deferred on account of the lack of funds. These involved the purchase of new special and other track work in particular. The company had purchased a one-man car which would shortly be placed on trial service, and was rebuilding another single-truck car for one-man service. Service had been discontinued on the Lynn (Mass.) belt line, and the abandonment of certain other track was under consideration.

Mr. Goff said that he had been specially assigned to apply as many of the Arnold recommendations as possible to the economical operation of the road. The repair force had been largely increased and the reconstruction of 200 cars for prepayment service had been undertaken in the company's shops. About 50 per cent more cars had been painted in the fall than in the corresponding period a year ago. The rising cost of labor and materials, however, had increased the estimated cost of remodeling per car from an $800 base to $1,200 in sixty days. This meant that the cost of rebuilding would be $240,000 instead of $160,000. When the company found itself unable to issue new securities last winter, it became necessary to suspend the work, after thirty-seven cars had been completed. In part the car shortage had been met by equipping open cars with canvas curtains and electric heaters, and running them express to and from munition and other war material plants in the rush hours. Mr. Goff said that the problem of transfers was being studied with reference to the one-man car. The concentration of shop and carhouse facilities recommended in the Arnold report, he remarked, had been impracticable under the financial condition of the company.

APPROXIMATE COST OF MATERIALS USED DURING CALENDAR YEARS 1914, 1915 AND 1916 AS COMPARED WITH THE COST AT THE PRICES OF MAY 1, 1917

Material	Approximate Annual Consumption	Approximate Costs for Years			1917	Per Cent Increase from 1914
		1914	1915	1916		
Equipment Department						
Axles	250	$3,980	$3,989	$5,689	$8,000	101.01
Babbitt	65,000 lb.	20,000	21,300	25,185	33,300	66.50
Brakeshoes	35,000	14,000	12,250	12,250	20,825	48.75
Car wheels, iron	5,000	18,750	18,750	21,250	37,500	100.00
Glass	1,600 boxes	6,096	7,080	9,024	12,640	107.35
Magnet wire	175,000 ft.	28,437	33,906	55,344	64,750	127.70
Machine steel	200 tons	6,400	7,840	12,960	19,400	203.13
Register cord	175,000 ft.	3,193	3,325	4,243	5,338	67.20
Segments	300 sets	6,543	6,615	8,265	14,064	114.95
Tape, insulating	18,500 lb.	3,615	3,615	3,700	5,010	38.60
Trolley wheels	8,500	5,525	5,525	6,460	9,435	70.77
Waste	70,000 lb.	3,066	3,430	5,250	7,000	128.32
White lead	16,000 lb.	1,040	1,028	1,350	1,680	61.60
Operating Department						
Salt	10,000 bags	8,000	8,200	8,600	9,400	17.50
Line Department						
Feeder wire	75,000 lb.	10,256	13,567	20,647	27,000	163.27
Pole paint	2,000 gal.	1,740	1,740	1,820	2,100	20.70
Poles, chestnut	2,500	14,547	15,667	17,974	19,112	31.38
Poles, steel	300	4,950	5,346	5,830	15,620	215.56
Span wire	525,000 ft.	3,591	3,808	5,342	6,510	81.30
Splicing sleeves	1,800	1,620	1,575	3,105	3,510	116.70
Trolley ears	20,000	3,075	3,400	4,700	5,400	75.62
Trolley wire, 97 per cent	85 miles	25,650	32,094	52,920	66,600	159.65
Track Department						
Bonds	30,000	21,150	25,248	28,710	37,200	75.89
Channel plates	115 tons	5,106	5,106	5,106	9,016	76.58
Paving blocks	400,000	24,000	22,600	22,700	27,200	13.34
Rails, tee	700 tons	19,600	19,600	19,600	28,000	42.86
Rails, girder	2,500 tons	97,000	97,000	97,000	134,500	38.66
Spikes	1,800 kegs	5,400	5,044	7,200	13,860	156.70
Track bolts	700 kegs	4,200	4,025	4,480	11,550	175.00
Ties	150,000	94,500	94,500	94,500	112,500	19.05
Tie rods	25,000	8,058	6,712	10,000	20,000	148.21
Total		$473,088	$493,885	$581,204	$788,020	66.57

Mr. Goff said that studies of the Maplewood, South Braintree and Somerset carhouses show that the advantages of consolidating the service of these stations with that of other operating centers appear insufficient to warrant the change, despite the intimation of the Arnold report that substantial economies could be obtained by reducing the number of operating houses. The desirability of installing additional feeders is recognized by the company, but with copper at 38 cents per pound the purchase of wire beyond absolutely necessary requirements is prohibitive. Glen Forest Park, Lawrence, has been sold and other parks have been put up for sale, but the market for this class of property is at present unsatisfactory.

Regarding the 6-cent fare on the country lines, Mr. Goff said that this has fairly met expectations with regard to increasing revenue. On the Gloucester lines, the best territory of this class, there was a 12.8 per cent increase in revenue in a recent three months' period. Taunton showed about the same increase, and on the Woburn lines the gain was 8 per cent. The abolition of tickets in Fall River, resulting in the establishment of a 5-cent fare in place of the former six tickets for 25 cents, has not resulted in any permanent decrease in traffic. The jitney menace in Fall River, the witness said, has mainly subsided into a cab service at higher rates. Jitneys operating between New Bedford and Fall River charge relatively high fares. About $300,000 a year, however, it is estimated, is lost by the company through jitney competition. Closing, Mr. Goff said that the company may have to curtail service next winter on account of the fuel situation. About 120 men have been dropped from the maintenance department, and only work necessary for safety is being done at present. The company has endeavored to economize in all possible ways, and needs about $2,000,000 additional annual revenue.

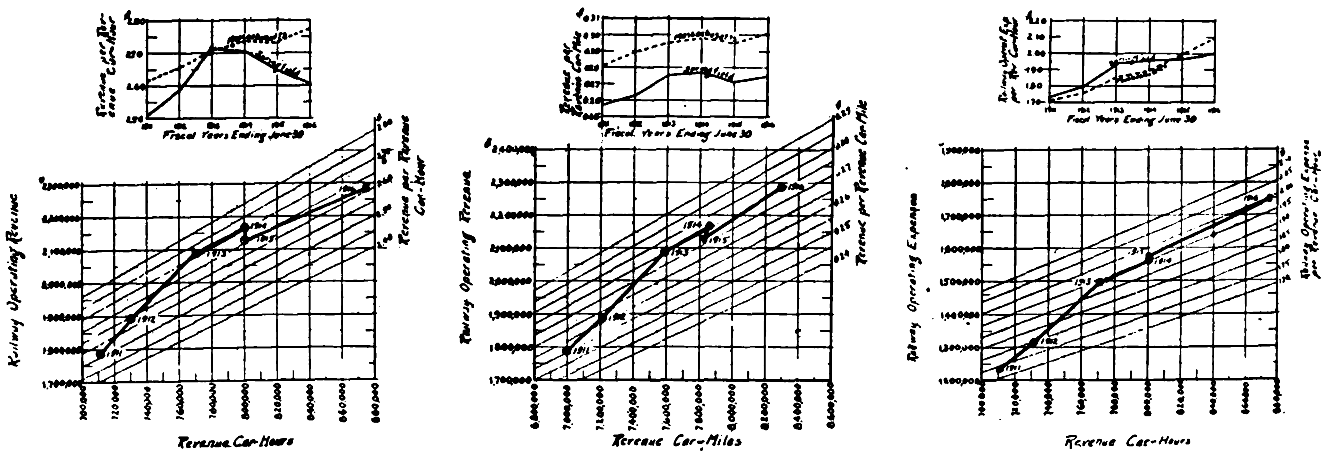
The subway system of the Interborough Rapid Transit Company, New York, N. Y., has carried 2,958,200,205 passengers, about twice the population of the world, in ten years. Each year it carries more than a third of the total number of passengers carried on all the railroads of the United States. Only one passenger has been killed in a subway train accident in ten years.

Springfield Company Wants 6-Cent Fare

Need of Massachusetts Company Explained by President Wood at Board of Trade Meeting —Professor Richey in Special Report States That Revenues Must Be Increased in Some Way

A 6-CENT FARE as the alternative to bankruptcy or public ownership faces the Springfield (Mass.) Street Railway, according to a statement of President C. V. Wood at a Board of Trade meeting on May 24, attended by local city government officials and prominent business men. Mr. Wood said that in the near future a petition on behalf of a 6-cent fare unit will be filed with the Massachusetts Public Service Commission.

During the meeting there was a discussion of a report just completed by Albert S. Richey, professor Worcester Polytechnic Institute, upon street railway traffic conditions in Springfield. Professor Richey, as stated more in detail later, predicted that increased fares must come if needed improvements are to be made and a reasonable return is to be paid upon the investment at present made and authorized.



Revenue per Car-Hour Revenue per Car-Mile Operating Expense per Car-Hour

FIG. 1—SPECIMEN CHARTS USED TO EMPHASIZE OPERATING DATA

General Statistical Data

According to Professor Richey's report, the expenditures of the Springfield Street Railway for the fiscal years ended June 30, 1911 to 1916, inclusive, increased from about $1,800,000 in 1911 to $2,300,000 in 1916, this increase being gradual and constant except that the amount for 1915 is less than that for 1914. In the four years (1912-1915) which showed a surplus, it was in each case considerably under 1 per cent, the maximum being in 1913 and amounting to 0.61 per cent of the total expenditures. The deficit in 1911 amounted to 0.37 per cent and in 1916 to 1.23 per cent of the total expenditures.

The operating expenses, amounting to a little more than $1,200,000 or 68.6 per cent in 1911, increased steadily until in 1916 they amounted to about $1,750,000 or 75.5 per cent of the total expenditures. Maintenance of way and structures fluctuated between a maximum of a little more than 11.2 per cent in 1912 to a minimum of 7.1 per cent in 1916. Maintenance of equipment showed its smallest percentage value in 1914, when it was 8.7 per cent, and its largest in 1913 and 1916, when in each case it was 11 per cent. The total of the two maintenance accounts is at present slightly more than 18 per cent, having been at the maximum in 1913, at which time it was 22 per cent.

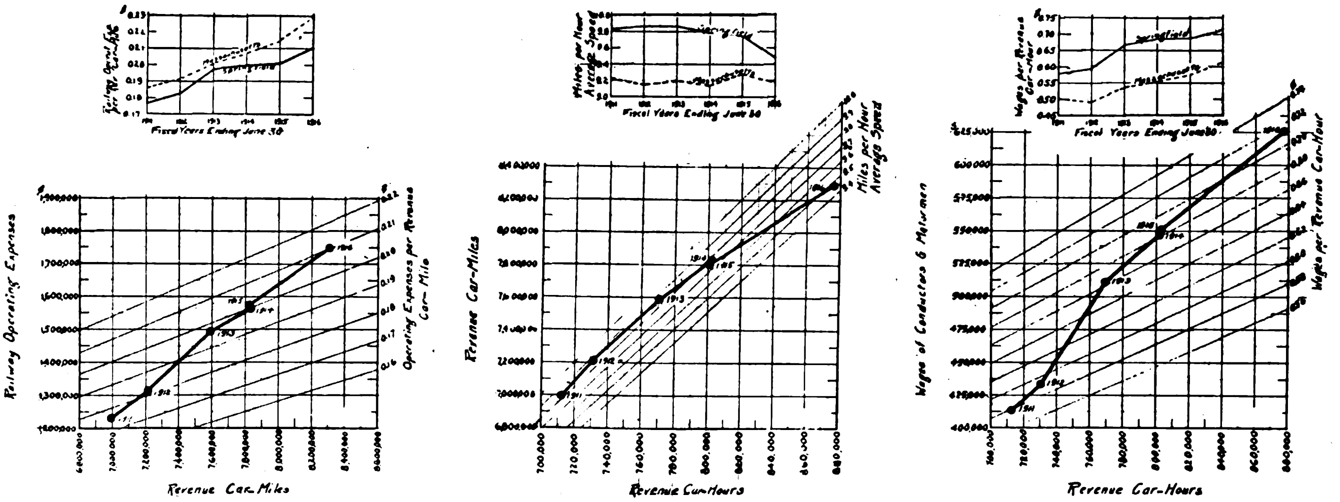
The amount expended for power ranged from 11.3 per cent in 1913 to 13.6 per cent in 1915. The 1916 expenditure for power was 12.2 per cent of the total expenditures. The cost of conducting transportation showed a most steady increase, not only in the amount expended but in the per cent of total expenditures. During the six-year period in which the total receipts of the company increased about 28 per cent, the expense of conducting transportation increased about 56 per cent, and the percentage of receipts paid out for conducting transportation increased about 20 per cent. In 1911 and 1912 less than 27 cents of each dollar of receipts was spent for this item, and in 1916 more than 32 cents.

The general and miscellaneous expenses ranged from a minimum of 9.4 per cent in 1913 to a maximum of 12.7 per cent in 1916. The average percentage is about the same as that of other railways in Massachusetts, excluding the Boston Elevated Railway. Taxes varied from 9.4 per cent of the gross in 1911 to 5.4 per cent in 1916. The average for all Massachusetts street railways, except the Boston Elevated Railway, is about 6 per cent for the six years, 1911 to 1916. The return on investment, consisting of interest and dividends, was $396,433 in 1911 and $443,864 in 1916. The sum is equivalent to 22 per cent of the total expenditures in 1911 and 19.2 per cent in 1916.

Charts Showing Operating Details

Fig. 1 and Fig. 2 contain charts which illustrate those prepared by Professor Richey to emphasize various operating data. The "revenue per car-hour" chart shows that the number of car-hours operated was increased at a slower rate than the revenue for the first three years considered, while for the last three years more car-hours have been operated than were warranted by the increase in revenue. The small chart above indicates that only in 1913 did Springfield have as high a revenue per car-hour as the rest of the State. In 1916 the Springfield revenue per car-hour had become 6 per cent less than for the rest of the State. The "revenue per car-mile" chart shows that evidently an effort has been made to adjust the car-miles run to the business. In 1913, 1914 and 1916 the revenue per car-mile was practically the same at about 27½ cents. The revenue per car-mile in Springfield was from 2 to 2½ cents less than in the rest of the State throughout the whole period.

The "operating expenses per car-hour" chart shows that for the last four years this item has been held fairly uniform, being $1.94 in 1913 and about $2.00 in 1916. The Springfield operating expense per car-hour was from 2 cents to 8 cents higher than for the State until 1914, but a few cents lower for the succeeding two years. The "operating expense per car-mile" chart points out that the operating expenses are increasing faster than the car-miles, but at about the same rate as for the State. From the "car-miles per car-hour" chart a slight increase in speed will be noted between 1911 and 1912, that of the later year being nearly 9.9 m.p.h. It has been steadily falling off, however, until in 1916 the average speed was less than 9.5 m.p.h., the greatest decrease being between 1915 and 1916.



Operating Expense per Car-Mile

Car-Miles per Car-Hour

Wages of Conductors and Motormen

FIG. 2—ADDITIONAL CHARTS USED TO EMPHASIZE OPERATING DATA

The "wages of conductors and motormen" chart shows the wages per car-hour increasing from 58 cents in 1911 to more than 71 cents in 1916. The average wage paid to the individual conductor or motorman was one-half of that amount, namely, 29 cents per hour in 1911, increasing to nearly 36 cents per hour in 1916. This represents an increase in wages per hour, time actually worked, of nearly 25 per cent between 1911 and 1916. This, it is said, is probably the highest average rate per hour paid to conductors and motormen of all street railways in Massachusetts or New England. The wages per car-hour in Springfield were 8 cents greater than those for the State in 1911 and 10 cents greater than those for the State in 1916. In other words, the average individual conductor or motorman in Springfield is now receiving 5 cents per hour more than elsewhere in the State, excluding Boston.

TRAFFIC SURVEY AND SERVICE STANDARDS

A comprehensive survey of the movement of cars and passengers in the first 5-cent fare zone (Springfield Division) was made during the period from Jan. 22 to Feb. 13, 1917. The principal items of information obtained through this survey have been plotted by routes and form a separate volume of 350 pages as a supplement to Professor Richey's report.

In the present consideration of data from the traffic survey, the proper total capacity of the Springfield cars is considered to be 75 per cent in excess of the seating capacity during rush hour periods. This allows a total of seventy-seven passengers for the ordinary forty-four-seat car during rush hours. Such a standard, however, should be applied as the average of the number of cars in the same direction on the same route in any one fifteen-minute period for five successive week days, in order to provide against the contingencies of irregular travel.

Fig. 3, prepared by Professor Richey, compares the loading time per passenger of the various types of cars for various numbers of passengers boarding at one loading point, and brings out the fact that, compared with the standard prepayment cars, the cars converted from open cars require from one-quarter to three-quarters of a second more time per passenger in loading. While it might be considered a serious error to purchase new cars with such step and platform arrangement, on account of the considerably longer loading time required, the Springfield Street Railway, it is said, cannot be censured for so reconstructing these open cars, as it makes a large portion of the equipment available for all-year-round use, which formerly was limited to a few months' use each year during the summer season.

All closed cars which have been purchased since 1914 have been equipped with about 65 per cent of the seating capacity in cross seats, so that the passenger faces the front of the car. This is considered to be a more comfortable position for the passenger, but on account of the short haul on many of the Springfield city lines, it is doubtful whether the policy of equipping all cars with so many cross seats is advisable, owing to the fact that such construction materially reduces the available standing area. It would seem that for routes where the haul is short and the rush hour loads large, economy would dictate the use of a car with longitudinal seats throughout its length.

ADEQUACY OF PRESENT SERVICE

Data of a general nature resulting from the traffic survey are included in the table on page 1002. The rush hours between 5.30 and 8.30 a. m. and between 4.30 and 6.30 p. m. comprise only five of the nineteen hours considered in the table, or about 25 per cent of the time. During this period, however, more than 65,000 passengers, or nearly one-half of the total, are handled. The figures indicate a much larger use of the facilities offered during the evening rush hour than at any other period of the day. It shows also the very limited use of the facilities offered during the hours between 8.30 a. m. and noon and after 6.30 p. m. If it were possible

GENERAL TRAFFIC DATA FOR CENTRAL 5-CENT ZONE OF SPRINGFIELD STREET RAILWAY

Period	Total Passengers	Total Passenger-Miles	Total Seat-Miles
5.30 a. m.—8.30 a. m.	32,155	82,605	132,958
8.30 a. m.—noon	17,299	41,219	131,106
Noon —4.30 p. m.	34,582	81,771	175,717
4.30 p. m.—6.30 p. m.	33,216	82,474	111,074
6.30 p. m.—12.30 a. m.	32,482	75,290	225,136
Entire day	149,734	363,359	775,991

	Pass. per Hour	Pass.-Miles per Hour	Seat-Miles per Hour	Load Factor, Per Cent	Av. Miles per Pass.
5.30 a. m.—8.30 a. m.	10,718	27,535	44,319	62.2	2.57
8.30 a. m.—noon	4,943	11,777	37,459	31.4	2.38
Noon —4.30 p. m.	7,686	18,171	39,048	46.5	2.36
4.30 p. m.—6.30 p. m.	16,608	41,237	55,537	74.3	2.48
6.30 p. m.—12.30 a. m.	5,414	12,548	37,523	33.4	2.32
Entire day	7,881	19,124	40,842	46.8	2.43

to take service out of these light hours and put it into the rush hours, especially between 4.30 and 6.30 p. m., to the same amount and at the same cost, the net result would be a much improved service.

Especially during the evening rush hours, however, the railway has in service all of its available equipment, so that in order to transfer any car-miles from the slack periods into the evening rush period, it would be necessary to provide additional equipment. Enough additional return must then be earned in the short evening rush hour period to pay not only operating expenses, but the fixed charges incident to the additional investment. Moreover, Professor Richey adds, the evening rush hour service, if increased, must pay a very much larger per cent of operating expenses than is required by non-rush-hour service, owing to the peculiar form of agreement between the Springfield Street Railway and its conductors and motormen.

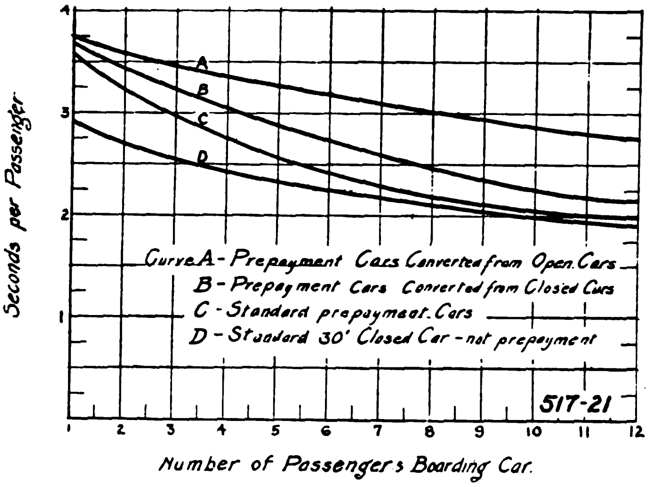


FIG. 3—COMPARATIVE LOADING TIME PER PASSENGER FOR DIFFERENT CLASSES OF CARS

The company's wage scale is on the daily basis, a definite amount being paid for each day, irrespective of the time worked, up to nine hours, after which overtime is paid. On all other roads in the State (and practically all other roads in the country) wages are paid on the hourly basis. The addition of a considerable amount of short rush-hour service in Springfield would therefore mean that the wages of the carmen concerned would amount to three to five times the sum paid for such services per hour during the normal hours. If such short-period cars were operated by men who had already done a day's work on an all-day car, the "intervening time" and overtime required by the wage agreement would likewise make the average wage per hour actually operated three to five times the average normal hour rate. Whatever interchange of service is made, Professor Richey says, must be with due regard to the comparative expense of operation in the two periods.

VARIOUS CHANGES RECOMMENDED

In a detailed consideration of routes, Professor Richey makes a number of recommendations relative to decrease of non rush-hour service and increase of rush-hour service. Non-rush service may often be decreased to advantage, he states, by a cutting off of non-productive service furnished to the outer ends of long routes. A large portion of such service might well be converted into service on short-haul routes through the center of the city where jitney competition is most active. It is especially recommended that service in these sections be increased during the evening rush hours. It would then be possible and desirable to operate "express" or "limited stop" cars through the downtown sections concerned, thus more nearly confining the short haul passengers to the short haul cars.

With the present one form of transfer for all lines, Professor Richey says, the privilege may quite easily be misused, either with or without the co-operation of the issuing or receiving conductor. Good practice demands that a separate form be used for each route and preferably a separate form for each direction on each route. A further protection against misuse consists in using a color scheme for transfers issued on cars bound in the same general direction. A considerable reform should also be made in requiring that the time be more accurately punched and that transfers be refused after a certain definite short interval, allowing for use only on the first car of the receiving line.

It is recommended that the spacing of white-pole stopping places throughout the settled residence districts be made to conform as closely as possible to a 400 ft. minimum and a 500 to 600 ft. maximum. Such a campaign would result in the elimination of 20 to 25 per cent of the stopping places. As for jitneys, they should be required to have licenses, and the operators should be bonded. To help in relieving congestion on Main Street, Professor Richey recommends "multiple berth passenger stops" on the near side. When more than one car is stopped at a traffic intersection all passengers should be required to board or alight at the point of stoppage, so that when the signal is given to proceed the cars may proceed without any making a second passenger stop.

The rates of acceleration and braking seem to approximate 1 m.p.h.p.s. in Springfield, being especially low in the Main Street section during rush hours. In this section, however, average rates of 1.50 to 1.75 m.p.h.p.s. should be used, and in other parts of the city it should be possible to use average rates of 2 m.p.h.p.s. At no time should parking of automobiles be permitted opposite the loading places, and during rush hours no automobiles should be permitted to stop opposite such places except at the bidding of traffic officers.

The limit of paying passenger haul on the Springfield division is around 2.75 miles, with the 1916 allowances for return on investment and depreciation. With the proper allowances for these items, the paying haul is in all probability less than 2.25 miles. The average ride for all passengers is 2.43 miles. The average ride of the cash passenger, including the ride on transfer when used, is 2.88 miles. The difference between the present average ride and the probable paying haul represents the distance over which the average passenger is carried at a loss to the company.

INCREASED REVENUE IS NEEDED

The Springfield division (the present central five-cent fare zone) failed during the fiscal year 1916 by about

$225,000 to earn enough to make a proper return on investment, and set aside a proper amount for depreciation and a proper contingency fund. Approved improvement requisitions, not yet completed, call for the addition of about $750,000 to the investment, and estimates shown of the cost of improvements which will further be required call for an additional expenditure of about $1,000,000. These expenditures cannot be made unless some measures are taken to increase the net income of the company.

Some of the recommendations, Professor Richey says, look toward reductions in operating expenses, but these probably will be more than balanced by increased prices of labor and materials. It is evident, therefore, that it will be necessary to increase the revenue. A fair method seems to involve the placing of the additional burden on the traffic which originates in the outside districts. This might be accomplished by establishing an inner 5-cent fare zone with a radius of about 2 miles and making an additional charge of 2 or 3 cents to riders beyond that zone, with the transfer privilege only slightly modified. A second plan might provide a 5-cent ride with free transfer between any two points within the central 2-mile radius zone and a 5-cent fare without transfer between the downtown district and the outlying limits of the present 5-cent fare zone.

A zone system, Professor Richey states in conclusion, will involve a number of difficulties in the proper collection of fares and use of transfers. It is not impossible to develop a system of fare collection and transfers which would reduce such difficulties to a minimum. However, such a development may require some considerable time, and in view of the apparent necessity for some immediate relief, it may be deemed advisable to obtain it by a flat increase to a 6-cent fare. Such a fare might later be replaced by a zone system after detailed studies had been completed.

Public Ownership Discussed

Public ownership was the chief topic before the regular monthly meeting of the Massachusetts Street Railway Association at Young's Hotel, Boston, on May 23. The speaker was Benjamin C. Marsh, secretary of the League for Municipal Ownership and Operation of New York. Mr. Marsh was requested to address the association in order that the members might obtain the viewpoint of government ownership advocates in connection with existing street railway financial difficulties. Mr. Marsh contended that the private ownership of public utilities was undesirable. In advocating public ownership he urged that the present operating officials and staffs be retained. G. S. MacFarlane, editor of the Boston *American*, spoke in similar vein. On behalf of the railways, Bentley W. Warren, Boston, addressed the meeting after the advocates of government ownership had been heard. He pointed out the sound capitalization of the roads in Massachusetts under the regulatory policies of the State and endeavored to show that the present return was far below that necessary to attract capital into the industry for anything like adequate development. Mr. Warren said that present rates of fare were ruinous. He set forth the fundamental points in relation to cost of service which the public must meet by decreased taxes or by higher rates.

The lines of the Portland Railway, Light & Power Company, Portland, Ore., afford access to many of the trout and salmon streams and fishing grounds in that district. The company has issued a folder entitled "The Trout Route," which gives information on fishing laws, the best streams and how to reach them by trolley.

New York City Hearings to Start on June 6

Third Avenue Railway's Application for 2-Cent Transfers to Be Considered First—Mayor Mitchel Opposes Revenue Increase

THE Public Service Commission for the First District of New York has set June 6 as the date for beginning hearings upon the applications of the street railways in New York City for action by the commission which will give them financial relief. The three main systems concerned are the Third Avenue Railway, the New York Railways, and the surface lines of the Brooklyn Rapid Transit Company. In general terms, each of these companies desires that the commission's existing order directing that transfers be exchanged upon the lines of each system be abrogated or that a charge of 2 cents be permitted for transfers, with no charge for retransfers.

The commission on June 6 will take up first the application of the Third Avenue Railway, and at public hearings press the case to as rapid a conclusion as possible. It will then take up in turn the application of the New York Railways and that of the Brooklyn Rapid Transit Company lines.

As stated last week in these columns, an application was also received by the commission from the New York & Queens County Railway, but this company did not ask for any specific form of relief. The application has been returned to the company with directions that it be made more specific.

This week an application for relief was filed by the Second Avenue Railroad, which asked the commission to "establish such new regulations in regard to rates, fares and transfer privileges, or otherwise so to exercise its authority as to make possible the earning of a more adequate return upon the capital invested." This application completed the list for New York City.

MAYOR MITCHEL OPPOSES INCREASED FARES

Mayor Mitchel announced on May 25 that he would insist that the city be represented at all the negotiations and hearings before the commission on the applications of the companies for increased fares. The Mayor sent a letter to Chairman Straus, asking him to notify Corporation Counsel Hardy when such proceedings were to be held. In a letter to Mr. Hardy, the Mayor directed him to appear at the hearings and "strenuously and constantly oppose the requests of the companies unless and until they show that the need for increased rates is imperative, permanent, absolutely necessary and cannot be met in any other way."

The Mayor's letter to Mr. Hardy follows in part:

"The policy of a uniform 5-cent fare with free transfers between all subsidiaries controlled by a single street railway has been the recognized policy of the city and State for many years. It should not now be upset merely because the companies may have encountered temporary difficulties, or because the war into which we have entered demands unusual sacrifices.

"Every citizen will be called upon to make money contributions which will be a hardship, and thousands will surrender not only their property, but their lives. Is there any reason why public utilities should be placed in an exempt class and allowed to increase their rates so as to preserve their earnings intact?

"If the companies had been sharing their profits with the public during the years when they were making large returns, their claims might be considered more favorably. But it will be recalled that in past years these companies have made large profits and the city's claims for readjustment or municipal purchase of their property were opposed.

"The companies pleaded that they had contracts with the city, and claimed that their rights to the earnings were protected by the United States Constitution. Hence, if the companies are now encountering unusual difficulties, is it just that the public should be required to bear their burdens when it has been denied any share in their profits?

"Certain of the companies about to petition the Public Service Commission have only recently been reorganized, and their petitions for the approval of large issues of securities were opposed by the commission on the ground that neither the value of their property nor their prospective earnings justified such capitalization. The companies contended that the commission had no jurisdiction over these matters, and they were upheld by the courts, not upon the value of their property, but upon the ground that the law gave them the right to issue any amount of stocks and bonds which did not exceed the total capitalization of the old companies. Consequently, neither the commission nor the public is under any obligation to recognize the claim of the companies to earnings upon excessive capitalization."

REPLY OF PRESIDENT SHONTS

Theodore P. Shonts, president New York Railways, on May 26 sent a letter to Mayor Mitchel, replying to the Mayor's letter to Corporation Counsel Hardy. President Shonts said in part:

"You are quite right in saying that the war demands universal sacrifices and the universal sharing of burdens. The public utilities which I represent, and, I am sure, all others, are only too willing to bear their share of all such burdens. But is there any reason why public utilities should be compelled to bear more than their share?

"You state very correctly that it 'has been the recognized policy to charge a uniform 5-cent fare, with free transfers.' But those of the present are very new conditions—conditions which must be met, unless the public service is to suffer. It has been the long-continued practice of the United States government to charge 2 cents for letter postage, but in the current revenue bill it is proposed to increase the postage to 3 cents.

"The steel companies have heavy burdens, and they raise their prices. Bakers must pay more for their flour, and they raise the price of bread. The old-fashioned 'dollar watch' now sells for $1.35. The 5-cent package of biscuit now retails at 8 cents. The newspapers pay more for their paper, and there is a very general movement to increase the price of newspapers from 1 to 2 cents.

"Street railways are paying more for their labor, more for their materials, and higher taxes, as their share of the burden of government expenses. All of these are burdens imposed by the war. Is it fair, then, that the public utility, and especially the street railway, should be singled out as the only kind of corporation which should not be permitted to raise its price in order to enable it to pay its tremendously increased expenses for rendering its service?"

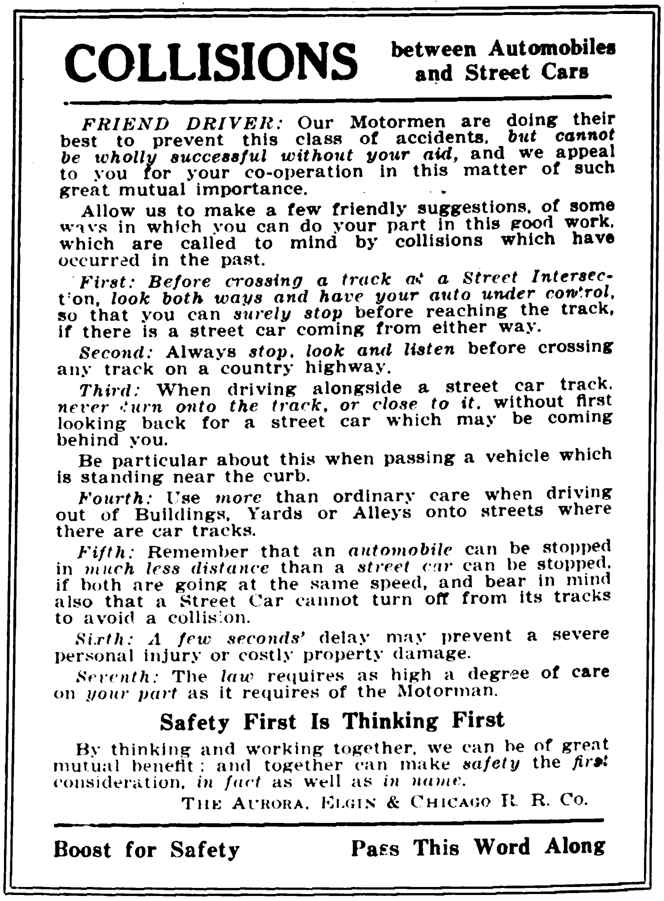
President Shonts also took exception to the Mayor's remark that "if the companies had been sharing their profits with the public during the years when they were making large returns, their claims might be considered more favorably." He added:

"The facts are that the properties comprising the present New York Railways have, during the last ten years, either been in the hands of receivers or operating without any profits to share. Yet during that same period the properties have paid the public more than $1,000,000 a year in taxes or more than 10 per cent a year of their gross earnings.

"This is the first time we have heard any proposition by the city for municipal purchase. I may say, however, that our company is in an extremely receptive mood toward any proposition contemplating a partnership between our company and the city, whereby the service to the public may be protected and the burdens of giving that service equitably adjusted in the public interest."

Working to Prevent Automobile Accidents

THE Aurora, Elgin & Chicago Railroad is making an especial attempt to impress upon automobile drivers the great need for caution on their part to help in preventing collisions between automobiles and street cars. As a direct appeal to motor drivers to co-operate with the company's motormen in avoiding this class of accidents which has come to be so numerous, the company has had 20,000 cards printed, as shown herewith, and distributed in the automobiles and garages throughout the territory served by the railroad. This has met with very favorable comment on the part of the automobile owners and drivers, and in several instances applications to the company have been made for additional copies to give to certain friends who were characterized as particularly careless drivers.



COLLISIONS **between Automobiles and Street Cars**

FRIEND DRIVER: Our Motormen are doing their best to prevent this class of accidents, *but cannot be wholly successful without your aid,* and we appeal to you for your co-operation in this matter of such great mutual importance.

Allow us to make a few friendly suggestions, of some ways in which you can do your part in this good work, which are called to mind by collisions which have occurred in the past.

First: Before crossing a track at a Street Intersection, look both ways and have your auto under control, so that you can *surely stop* before reaching the track, if there is a street car coming from either way.

Second: Always *stop, look and listen* before crossing any track on a country highway.

Third: When driving alongside a street car track, *never turn onto the track, or close to it,* without first looking back for a street car which may be coming behind you.

Be particular about this when passing a vehicle which is standing near the curb.

Fourth: Use *more* than ordinary care when driving out of Buildings, Yards or Alleys onto streets where there are car tracks.

Fifth: Remember that an *automobile* can be stopped in *much less distance* than a *street car* can be stopped, if both are going at the same speed, and bear in mind also that a Street Car cannot turn off from its tracks to avoid a collision.

Sixth: A few seconds' delay may prevent a severe personal injury or costly property damage.

Seventh: The *law* requires as high a degree of care on *your part* as it requires of the Motorman.

Safety First Is Thinking First

By thinking and working together, we can be of great mutual benefit; and together can make *safety* the *first* consideration, *in fact* as well as *in name.*

THE AURORA, ELGIN & CHICAGO R. R. CO.

Boost for Safety **Pass This Word Along**

INDUCING THE AUTO DRIVER TO CO-OPERATE IN AVOIDING COLLISIONS

The Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., is advertising its service to Fort Sheridan and the Great Lakes Naval Training Station from Chicago and Milwaukee and intermediate points.

Editors Hear Department Heads

Cabinet Officers, Members of the Council of National Defense and Others Connected with the Government at Washington, Explain War Problems to Technical Papers

An editorial conference of the business papers of the country was held in Washington on Friday, May 25, in the cabinet room of the New Willard Hotel. Its purpose was to allow the editors to obtain information first-hand from the heads of important departments of the federal government on the problems which the government is facing in connection with the present emergency. Abstracts of the various addresses follow.

NO SHORTAGE OF COAL

The first address of the conference was by Francis S. Peabody, chairman committee on coal production, Council of National Defense, who explained the relation between the civilian bodies in Washington and the federal departments, and said that the civilian helpers had found the departments most efficient and not hampered with red tape. It was a great pleasure, he said, for these civilians to realize that age is no barrier to service for the government. He explained that there was no shortage of coal but only a coal panic, brought about by householders believing that it was necessary to fill their bins immediately for next winter's consumption. The production was larger last year than ever before, and if people would wait all would be supplied. The chief trouble at present was in transportation, not in production. Priority in shipments should be given first to the urgent needs of the government, second, to those of manufacturers of munitions, third to roads carrying coal, and fourth to roads carrying grain and other food products.

THE AGRICULTURAL SITUATION

The second speaker was Dr. Raymond A. Pearson of the Department of Agriculture, who said that in 1916 there was a reduction in crop yield throughout the entire world, due to a shortage of labor, a shortage of fertilizers and to climatic conditions. The speaker urged that all corporations encourage their employees to participate in gardening, particularly of foods that can be kept for next winter's use. It is also desirable for each section of the country to produce the food that it will need for its own use. In this way the transportation facilities of the country will be relieved for war needs. The co-operation of business concerns in allowing their employees to assist is especially important during harvest time in getting in the crops, as that is the peak of the load. A great many business men have agreed to pay their men at this time the difference of wages, if any, between that which the farmer can pay and what they would have been earning in the factory or wherever they have been employed. The speaker estimated the shortage of farm labor at the present time to be from 1,500,000 to 2,000,000 men.

ADDRESS OF SECRETARY REDFIELD

Hon. William C. Redfield, Secretary of Commerce, then spoke about various lines of work in which the department was engaged, notably in developing the supply of fish for food, and, through the Bureau of Standards, of creating the industries of optical glass and dyestuffs. Secretary Redfield urged the editors to impress upon their clienteles the reasonableness of any export limitations which the government may impose, as well as the value of the co-operation which the government departments are receiving from volunteer civilian assistants.

FRANK A. VANDERLIP ON FINANCIAL NEEDS

Mr. Vanderlip spoke of the necessity of organizing the nation for the business of war, which meant organizing all of the industrial powers of the nation. The present authorized loan of $7,000,000,000 was the biggest financial operation which any government has ever undertaken. All of the money in all of the savings banks of the country is $5,000,000,000. All of the stocks of all of the railroads of the country are $8,700,000,000. All of the money in all of the bank vaults of the country is less than $2,000,000,000. The country is rich and its wealth is estimated at $250,000,000,000, but it is in farms, homes, railroads and factories. The money on deposit in banks is not idle but is out on loans and cannot be called in to pay for the first issue of $2,000,000,000 without causing great distress and business depression. Instead, the loan must be placed by an expansion of individual banking credit and financed out of the savings of the future. The savings of the past are not available because they have been invested. This country has a more difficult job in one way than England had, as it is absolutely self-contained now—that is, there is no place to go to for money. Whatever is done, we must do it by anticipating the savings of the future. This will be a lesson of tremendous importance in thrift to the whole nation. This policy of thrift does not mean that general business is going to be bad.

On the contrary, business is going to be more active than ever before, but it will be a business in necessities. People cannot give the government $7,000,000,000 of purchasing power and expect to have as much purchasing power themselves as before. It will be an absolutely unpatriotic thing to spend money on an unnecessary thing, no matter how much money one has, not only because of the money spent but of the labor diverted from national purposes. Persons will be thrown out of employment by this change in conditions, but not into unemployment, as there will be two jobs waiting for every person now engaged in unnecessary business. The speaker urged his auditors to impress on their clientele that we are in a real war, a war that must measure our whole co-ordinated forces, our moral forces, our industrial forces, and our financial forces. Undoubtedly we shall see inefficiency developed, but the experience of that inefficiency is going to make every citizen see that he has duties of citizenship, and more clearly than ever before.

ADDRESSES OF SECRETARIES DANIELS, LANE AND BAKER

Hon. Josephus Daniels, Secretary of the Navy, declared that those who established the navy provided wisely that its officers should come from every section of the republic, and many of the greatest admirals in the navy are from inland states and had never seen salt water before going to Annapolis. The first need of the navy is for men, and the recruits now coming in are of a very high grade and many have engineering knowledge. The second need of the navy is for ships. Those too old to serve can assist in financing the government.

Hon. Franklin K. Lane, Secretary of the Interior, outlined the issues of the war and declared that it was one for democracy and that "government by the soldier is not consistent with government by the people."

Hon. Newton B. Baker, Secretary of War, was the next speaker. He expressed the belief that the German ruling mind had become so upset with the grandeur of industrial supremacy that it had lost complete sense of the existence of moral standards. The Secretary also said that in its mobilization of the resources of this country for war purposes, the government would necessarily break in upon the long-established habits of great numbers of people. This is inevitable. Everyone will be asked to do something or to give up something, but this sacrifice is necessary in the national interest. In conclusion the speaker said that the government would not ask the papers to forebear criticism of the government, but urged that it be constructive.

ADDRESS OF SECRETARY WILSON

The conference then listened to an address by Hon. William B. Wilson, Secretary of Labor. He said that in the co-ordination and reorganization for war our industries must go through a process of mobilization, and this means also the mobilization of labor and a change from one industry to another. Such changes mean changes in working conditions, and it is the function of the departments of labor of the federal government and of the state governments to assist so that these changes will be made with the least possible friction. This mission is to be performed not judicially, but by finding a common ground between employers and employees which will be mutually acceptable, even though it may not be mutually satisfactory. The speaker illustrated the services which can be rendered by the Department of Labor by quoting the results obtained from recent mediation in the coal business. Another hope of the department is to assist the farmers at harvest time by arranging so that employees in other industries will be released during those weeks to assist in harvesting the crops. At such times the owners of factories can arrange to close down the plants and make necessary repairs.

THE PETROLEUM AND GASOLINE SITUATION

The production and consumption of petroleum and gasoline in the United States were discussed by Van H. Manning, director of the United States Bureau of Mines. Mr. Manning said that of the 54,000,000 barrels of gasoline now being produced in the United States, between 55 per cent and 60 per cent is used in the automobiles of the country, 20 per cent to 25 per cent is exported, and the balance is used in stationary engines, motor boats, and tractors and for various purposes of minor importance. In the speaker's opinion the call for gasoline will not be reduced from these figures—in fact, a much larger amount seems needed. There is an equal demand for other products of petroleum, such as the use of lubricating oils, and radical steps should be taken to conserve the use of this material. One of these is the substitution of coal for crude petroleum as a fuel under boilers for the generation of steam. The increased demand because of the war is difficult to estimate. The Bureau of Mines is studying more efficient methods of production of gasoline, as by the so-called cracking process, the extraction of vapors from natural gas, and the utilization of liquid fuels from other than petroleum bases. Substitutes for gasoline, such as the production of distillation of coal, are being used at present in Europe for motor fuels and may in time be used for that purpose in this country, as many by-product coke ovens are now being constructed.

ADDRESS OF HERBERT C. HOOVER

The next speaker was Herbert C. Hoover, food administrator, who thought we should prepare for a war of attrition, and that meant a long war and one in which this government will have to bring to bear every possible national resource. Most of the food for Europe during the coming year will have to come from North America, because there has been a harvest failure in the Argentine, and Australia and India are practically cut off from the shipping point of view. We must have a lower level of prices and greater stability of prices than during the last year. If prices can be stabilized the margin between producer and consumer will diminish materially. Another necessity is the reduction of waste, both national and in the household. In the latter there are four directions in which the women can accomplish an enormous amount of saving. One of these is substitution, by the use of local products for those from distant fields and vegetables for staples, another is a reduction in actual consumption, as most people eat 40 per cent more than they need. Then there is the question of household waste and the doctrine of the "clean plate."

ADDRESSES BY OFFICERS OF THE COUNCIL OF NATIONAL DEFENSE

The conference then listened to addresses by several officers of the Council of National Defense. Walter Gifford, director, outlined the organization and aims of the board and gave a sketch of the scope of the work of the important committees. Frank Scott, chairman of the munitions board, quoted examples of some of the recent work assigned to that board, including the erection of cantonments for more than 1,000,000 men. He said that the board would be obliged to build what amounted to thirty-two cities in the United States to house approximately 30,000 men each. This is the equivalent of the housing capacity of Buffalo, Syracuse and Rochester together, with sewage system and water system, heating facilities and lighting system, laundries and water systems, and this must be done between the present time and the middle of September. Dr. Franklin H. Martin, in charge of Red Cross work, medicine and sanitation, described how surgical instruments had been standardized and gave an account of the work undertaken by that department.

COMMITTEE ON PUBLIC INFORMATION

George Creel, chairman of the committee on public information, then explained to the editors the system adopted by the government of giving out information and the rules which the government would like to have the papers follow in referring to military operations.

ORGANIZATION OF THE STEAM RAILROADS

Howard Elliott, formerly president of the New York, New Haven & Hartford Railroad and now a member of the executive committee of the Council of National Defense, then described the organization of the steam railroads. There is a main committee of five, with subordinate committees in each of the departments of the country, committees on car service, military equipment standards, military transportation accounting, military passenger tariffs and military freight tariff. The Washington organization has sixteen experienced railway officers, sixty-nine general employees and eighteen inspectors. The committee on car service has twenty-three sub-committees distributed geographically, with an experienced railroad officer as head of each and representatives of all the railroads of each division territory on the committee. The expense of this entire organization, not counting the salaries of officers who are devoting a large amount of their time to this work and carrying on their regular activities as railroad officers as well, is about $500,000 a year, and this expense the railways contribute. The so-called car shortage, Mr. Elliott explained, is not so much a shortage of cars as a lack of terminals, sidings, modern appliances, etc., for handling traffic. These have not been added to the railroads during the last five or ten years to the extent that they should have been added, owing to lack of funds. The so-called shortage amounts to 150,000 cars, and there are about 2,500,000 cars in the country. By more prompt action by the shipper and by all railroad employees, it is hoped that the lack of these cars will be overcome. The railroads are planning to make some changes in their passenger schedules, not with the idea of saving money but to save man power, fuel and motive power, all of which should be applied to the transportation of essentials. The railroads, to have their maximum efficiency, must have the help of every man within as well as outside their organizations who has anything to do with shipping or handling of equipment.

REPORT OF THE GEOLOGICAL SURVEY

A statement of some of the recent work of the United States Geological Survey was presented by George Otis Smith, director. He said that of the four most important metals—iron, copper, zinc and lead—the nation's resources of ore have been found sufficient to meet the rapidly-increasing demands of ourselves and of our allies, although for the present year this means increases of from 50 to 90 per cent above the average output for the years just preceding the war. One of the purposes of the United States Geological Survey is to bring consumer and producer together, and its field geologists are to-day in the West and South seeking to add to the known supply of such other varied minerals and ores as pyrite, glass sand, tin, platinum, graphite, manganese, potash, tungsten, petroleum and nickel. As regards iron, the basis of America's industrial development, the new discoveries of ore are practically keeping pace with the heavy production. On the subject of coal and iron, Americans can be optimistic. The Geological Survey is also studying possibilities in new hydroelectric developments.

ADDRESS OF LOUIS B. FRANKLIN

The final address of the meeting was by Louis B. Franklin and related to the methods being followed in floating the Liberty loan bonds.

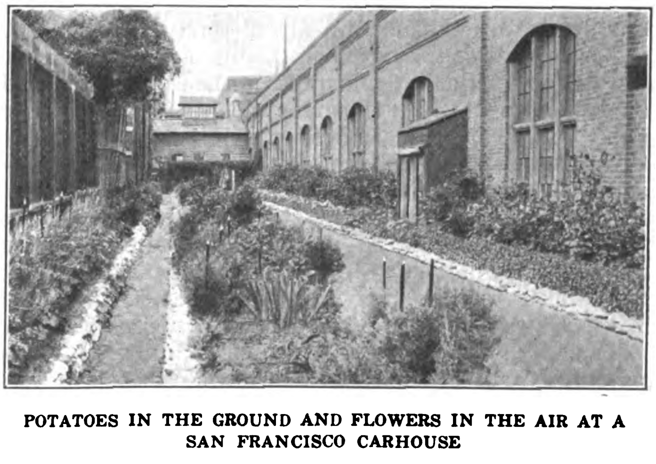
Mr. Franklin said that while the other departments of the government were asking for man power, the Treasury Department was asking for money power. The banking resources of the country are handling a record-breaking business from month to month, and their resources should not be strained by the purchase of Liberty bonds to the extent of $2,000,000,000. These bonds should go instead into the homes of people. The banks can help by extending credit to purchasers, but the government does not want to put the load directly on the banks. Some have said that the loan would have a bad effect on business, but if we do not raise the money to finance our armies, our navies, and our allies, there is going to be very little business left in this country. It will be the salvation of business if the war is carried through to a successful conclusion at the earliest possible moment, and money is going to put it through quickly. The funds raised by the present loan will remain in this country and will make the wheels of commerce here revolve faster than they ever have before. The gross income of the country is $50,000,000,000 a year, and at the present rate the government wants 10 per cent of this amount, or $5,000,000,000 a year. Hence, every man, woman and child should devote 10 per cent of their income to the service of the government loan. As already explained, this amount must come out of current savings. Employers should arrange to purchase bonds for their employees and let them pay for these bonds at the rate of 10 per cent of their weekly or monthly pay. In this way the employees will not have to sign checks or go to a bank. If the loan is going to depend on Wall Street, our enemies on the other side who are hoping that the loan will fail will be pleased. The effect of the loan should be to encourage thrift throughout the country, and this quality, if acquired, should stimulate business in years to come. The loans in France and Great Britain have been of a popular character. For instance, the first loan in Great Britain was taken up by 150,000 subscribers, but the last loan was taken up by 8,000,000 subscribers out of a population very much less than ours. With our population of 100,000,000 people, it would be a shame if we could not do as well.

Changing a Carhouse Scrap Pile to a Farm and Garden

Long before the cry "To farms! To farms!" threatened to make every stay-at-home a new kind of embattled farmer, at least one far-seeing railroad man had taken Sir High-Cost-of-Living by the throat and choked him on potatoes.

The railroader in question is J. W. Davies, foreman of the Turk and Fillmore carhouse of the United Railroads of San Francisco who, for the past three years, has been running a combination farm and garden alongside the carhouse.

The suggestion for this plantation came from Jesse M. Yount, master mechanic of the company, who thought that greenery would look better than a repository of scrap iron and other goat provender. At first, the area was simply cleaned up and some climbing nasturtiums were trained to keep their eyes on the shopmen.



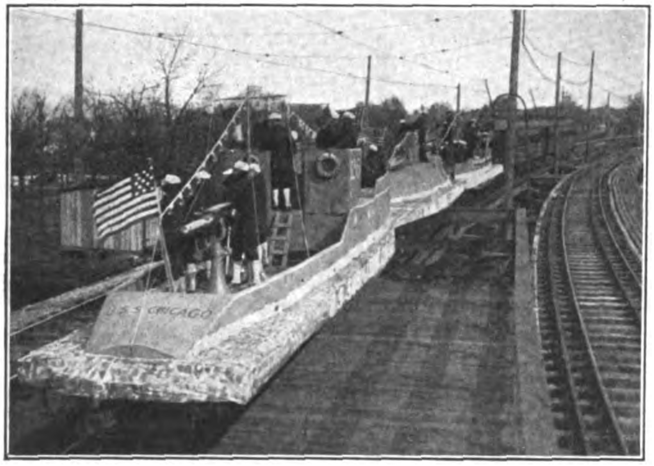
POTATOES IN THE GROUND AND FLOWERS IN THE AIR AT A SAN FRANCISCO CARHOUSE

It is the 1916 growth which is shown in the accompanying halftone. The sticks are not for the intoxicating beer hop, but for the cheerful dahlia. Mr. Davies may be termed a dahlianist as he has raised some 300 varieties. For this season he has divided the plot into two sections—176 ft. x 9 ft. and 183 ft. x 11 ft.—which are devoted exclusively to the delightful dahlia and the justly popular potato.

Electric Railways Co-operate with War Department

Recruiting Train Operated by Chicago Elevated Railways—Help from Railway Industry Discussed by New England Street Railway Club

A FEATURE of the recent reports on war-time activities of electric railways has been the effort to bring about the most effective degree of co-operation between the industry and the government. To this end, Britton I. Budd, president of the Chicago Elevated Railways and of the Chicago North Shore & Milwaukee Railroad, has placed in service a "recruiting train," this being designed to stimulate enlistments in the naval service. The train, which has been operated at frequent intervals around the downtown loop in Chicago, is made up of one of the North Shore line's new dining cars, a steel passenger car which serves as a recruiting office, and three flat cars that are fitted out as replicas of a battleship, a submarine and a submarine chaser. The latter are manned by about thirty marines. A full-sized torpedo is carried on the top of the submarine, and two small guns are mounted on the car that is fitted up to represent the submarine chaser. One of these guns, a one-pounder, is fired at intervals during the travel around the loop, and this, together with a navy band, serves to attract a great deal of attention.



ELECTRIC RAILWAYS IN WAR TIME—RECRUITING TRAIN OPERATED BY CHICAGO ELEVATED RAILWAYS

Recruits are picked up by the train as it passes the "L" stations and while it is standing in the Fifth Avenue terminal between trips. In the evening the train takes recruits that have signed up to the Great Lakes Naval Training Station, which is located on the Chicago, North Shore & Milwaukee Railroad. This procedure will probably be continued for one or two weeks. Meantime plans are being formulated for operating the train over some of the electric railway properties outside of Chicago. The three flat cars have standard M. C. B. equipment, so the train can be taken over practically any electric railway system in the central western territory, and it has already been loaned to the Aurora, Elgin & Chicago Railway for use on that company's lines.

NEW ENGLAND STREET RAILWAY CLUB DISCUSSES WAR-TIME PROBLEMS

Co-operation with the government was the keynote of the meeting of the New England Street Railway Club, in Boston, Mass., on the evening of May 24. President A. H. Ford occupied the chair, and among the guests were many army and naval officers of distinction, including Brig.-Gen. Clarence R. Edwards, U. S. Army. In an address General Edwards made the point that railroads and street railways can help at this time by arming section gangs and carhouse forces, giving a revolver to about 25 per cent of the men and providing the rest with clubs for patrol work, thereby releasing guardsmen for intensive training or first-line work.

President M. C. Brush of the Boston Elevated Railway was called upon by the chair to speak on behalf of the electric railway interests. With regard to his company about 1800 blue-uniformed men are between twenty-one and thirty-one years of age, and in other branches of the company's work 1500 men. To the extent that older men and women can be substituted, enlistment from electric railway service is to be encouraged, but the importance of electric railway transportation is so great that it should be maintained intact so far as possible. "Not for weeks," said Mr. Brush in this connection, "have we hired a man under thirty-one. As the war continues, we plan to use women in every conceivable capacity. I have no fear of the treatment which will be accorded women in Boston or New England. We have selected a uniform including overskirt, jacket, cap and badges for women conductors."

Mr. Brush said that manufacturers should co-operate by being willing to close their establishments at different hours, thereby reducing the peak demand on the street railway system, which is the great problem of the company. Mr. Brush agreed with General Edwards that the time has come for electric railways to take up the burdens of bridge and other protection, so far as required to release soldiers for intensive training and active field service. On the Boston Elevated Railway 850 special police have been sworn in for war-time service.

The speaker said that whereas the entire facilities of the Boston Elevated Railway are at the free disposal of the military authorities in any emergency, he believed that the normal service of the company should be rendered to the government at the regular cost. In other words, men in military uniform under normal conditions should be transported at the expense of the government and not free of charge. "The newspapers came to me about this matter, and I took the position you do," interjected General Edwards at this point.

Closing, Mr. Brush said that there never was a time when the electric railways were so poorly prepared financially to be of the maximum service as to-day but that the country can count upon their doing the utmost within their power to help win the war.

MISCELLANEOUS NOTES

In Chicago the railways have been prominent in connection with the Red Cross campaign for members. The Chicago Surface Lines turned in 11,000 names as new members and paid $11,394 in cash to the society as the result. About 8000 of the new members were from the company's transportation department, and about 85 per cent of the total number of employees of the Chicago Surface Lines have joined the society. As names are still coming in, the total membership within the traction company's organization is expected to exceed 12,000.

Public utilities uniting for war service is a feature of the recent developments in New York City. Here the power, light and traction companies will co-ordinate their efforts to aid the government, as mentioned in the ELECTRIC RAILWAY JOURNAL for May 19. Recently this organization, which has been formed at the behest of the Public Service Commission, First District, has announced that it will be represented by a permanent executive committee, of which Travis H. Whitney, public service commissioner, is chairman and Ivy L. Lee secretary. The membership includes also George Keegan, Interborough Rapid Transit Company; Edward A. Maher, Jr., Third Avenue Railway; John J. Dempsey, Brooklyn Rapid Transit Company; Wilbur C. Fisk, Hudson & Manhattan Railroad, and Frank R. Ford, representing the American Electric Railway Association.

On the Berkshire Street Railway the employees have been organized into syndicates for working unused land belonging to the company. Under this arrangement the company supplies the land, plowing, harrowing and the seed all being financed directly through the general manager and the cost being returnable at the time of gathering the crops. Each syndicate takes about 2 acres and its general supervision is under one of the officials of the company. Four of these syndicates have been organized, each made up of twenty employees, and they have planted 4 acres to beans and 4 acres to potatoes and cabbage.

COMMUNICATION

What Causes Double Wheel Treads?

MELBOURNE, BRUNSWICK & COBURG
TRAMWAYS TRUST
COBURG, AUSTRALIA, April 25, 1917.

To the Editors:

I shall be pleased to hear from any of your readers if in investigating the trouble of "double treads" on car wheels they have arrived at a satisfactory explanation of the cause.

We use Brill 21-E trucks with wide-winged axle boxes and M. C. B. journals. The truck wheelbase is 7 ft., and rolled-steel disk wheels, 33 in. in diameter are used. We use British standard 90-lb. flanged girder rail on tangent track and 96-lb. standard rail on curves. Curves in opposite directions in the permanent way balance each other. All wheels are pressed on at equal distances from the ends of the axles with the aid of a special gage and a center pop in the middle of the axle.

On several of the equipments there is no sign of this trouble; on one or two only one wheel out of the four shows it, accompanied by a thin flange on the mate; on other equipments two wheels, both on the same side, show the double tread, the mate showing thin flanges, and in still other cases one wheel on one side of the truck and the wheel on the other pair on the opposite side had developed the trouble.

There was one instance in which I took a pair of wheels on their axle, in perfect order, after they had made 21,000 miles under one car, and placed them under another car to replace a set where a bad double tread had developed. The new pair immediately started to develop a double tread, and the pair which replaced the good pair on the original car, although freshly turned, also started to develop a double tread. In another instance I turned up both pairs of wheels for double tread and replaced them under the same car. These wheels have so far given no sign of double tread. Since this matter has been given attention great care has been taken to see that all trucks are assembled perfectly square, but this apparently has had no effect.

I do not see how any track defects can produce such irregular defects in the wheels and therefore am of the opinion that the cause is confined to the trucks, axle boxes and journals.

STRUAN ROBERTSON, Engineer and Manager.

AMERICAN ASSOCIATION NEWS

Bulletins of Committee on National Defense

In addition to its activities in compiling data for the government the American Association committee on national defense is sending out a series of bulletins to member companies. Of these the first was reprinted in the issue of the ELECTRIC RAILWAY JOURNAL for May 26.

The second bulletin related to co-operation with the Secretary of Commerce in his efforts to increase food production. It was suggested that companies can make their co-operation valuable: First, by awakening, through car and other forms of advertising, and by personal efforts of their agents, the interest of farmers and truck raisers along their lines to the importance of bending every effort to carry out the President's injunction as to food production; and, second, by carefully studying and putting into effect methods of assisting such farmers and truck raisers in the marketing of their product. Companies are urged to get into touch with government departments of agriculture and other agencies which are concerned in increasing food production; and to encourage employees to raise garden products sufficient at least for their own needs.

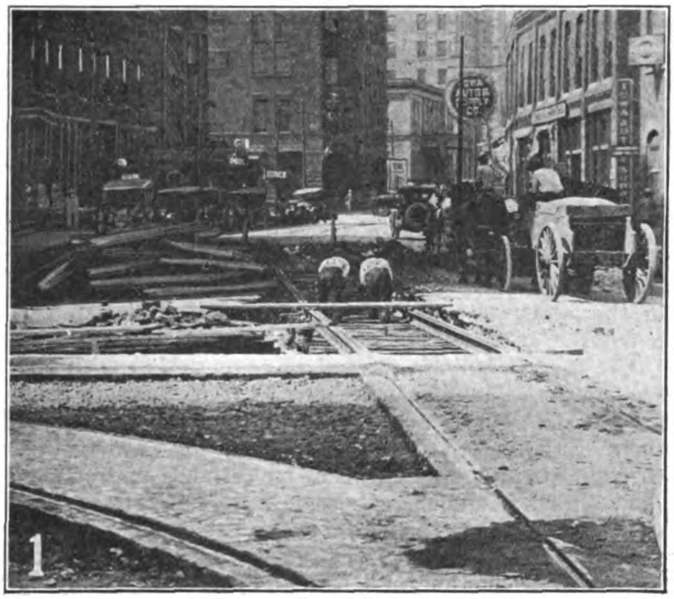
Bulletin No. 3, issued May 26, suggested plans for assisting employees to purchase "Liberty Loan" bonds, particularly by arranging for installment payments. Bulletin No. 4, sent out on Tuesday of this week, covered the subject of next Tuesday's registration, particularly with reference to requests for exemption from active service for men considered essential to the maintenance of good service.

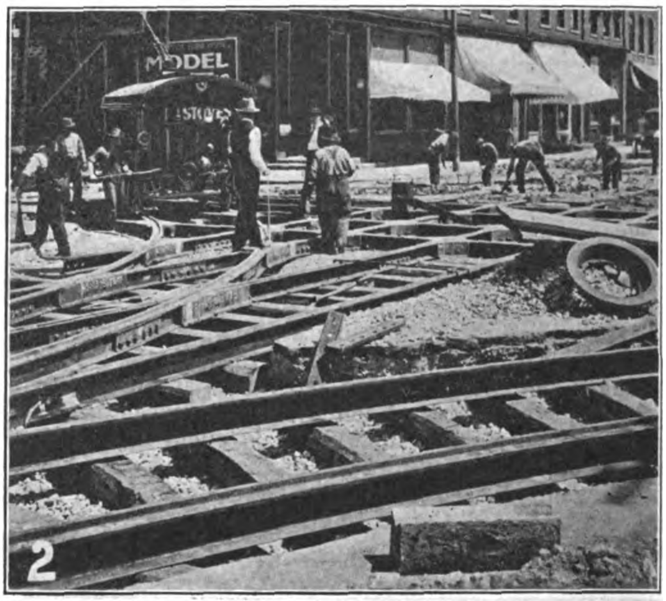
Patriotism the Keynote at Toledo Section Meeting

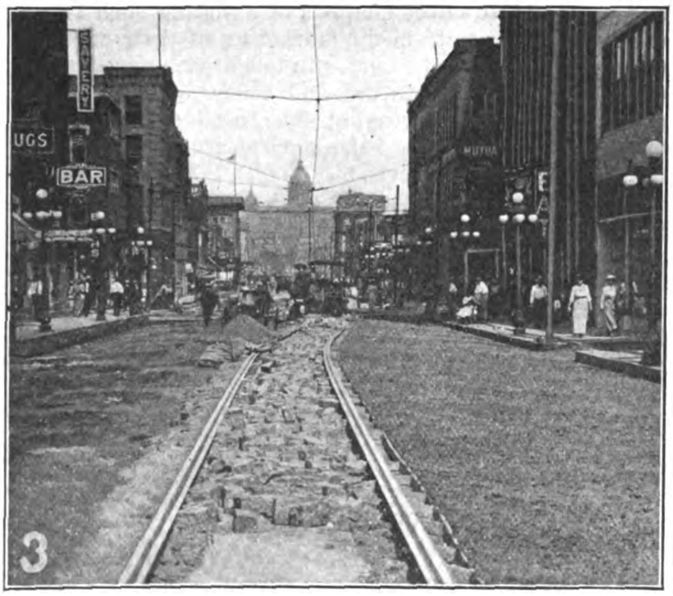
Judge Daniel J. O'Rourke of the Toledo city court made a patriotic address before 300 members at a meeting of the local company section held on May 25. His talk dealt with the importance of the central station in the great war, and with the co-operation which must exist between the producing and distributing army and the fighting army. A. C. Rogers explained a partial payment plan under which employees could buy "Liberty Loan" bonds, and to this talk has been credited much of the alacrity with which subscriptions poured in during the following day. Motion pictures of the Toledo troop of the National Guard in service on the Mexican border were also shown.

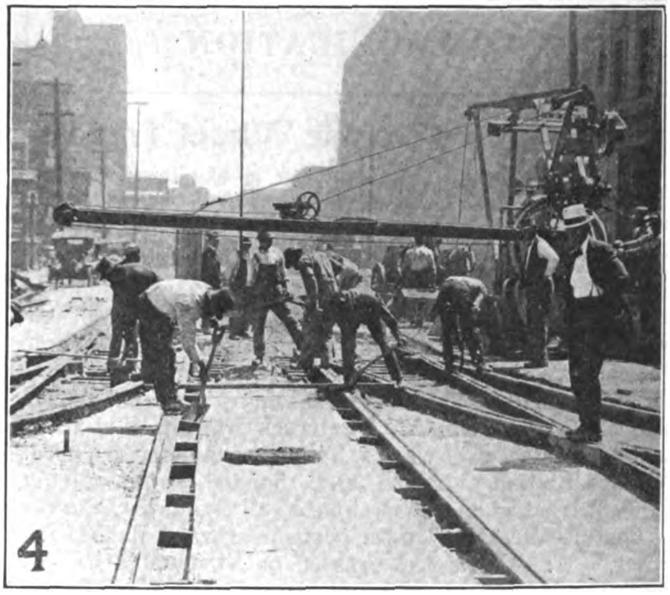
The election resulted in the return to office of the following, who were elected last February for a partial term. The respective departments appear after the names: T. J. Nolan, chairman, production; G. E. Snider, vice-chairman, electric; H. Friede, secretary, engineering; A. G. Van Driesen, treasurer, executive. Directors: James Doheny, Central Avenue shops; Duff Poirer, transportation; W. C. Cramer, gas; A. C. Rogers, heating; R. A. Eck, accounting; H. J. Kunz, new business; B. R. Donovan, claim; H. E. Wheaton, railway.

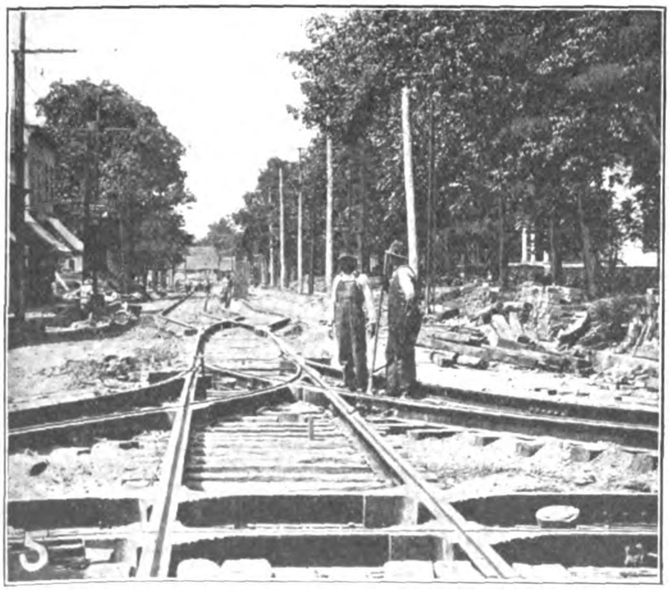
The Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has conducted two excursions recently from Fort Wayne to St. Louis, Mo., via Bluffton, Ind., and the Toledo, St. Louis & Western Railway (Clover Leaf).











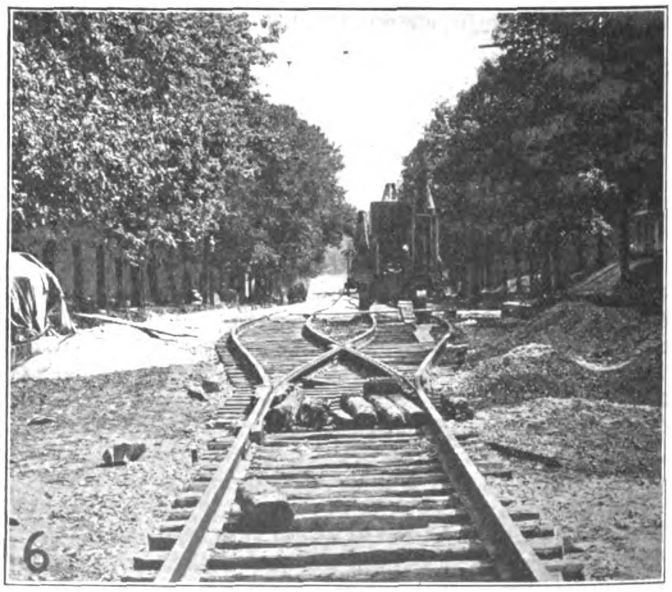


Fig. 1.—Granite block paving all the way across between rails. Fig. 2.—Installing special work at West Ninth Street and Grand Avenue. Fig. 3.—City paving work under way in conjunction with track construction. Fig. 4.—Pouring concrete base, leaving space for granite nose blocks. Fig. 5.—Double track reduced to single track at intersection to save space and cost. Fig. 6.—Residence track construction. Note temporary flanges on traction wheels of concrete mixer.

Typical Track Construction Scenes in Des Moines (Iowa) Streets

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Track Construction in Des Moines

Entire Downtown Track Layout Rebuilt Without Stopping Traffic—Types of Construction Described

BY W. L. WILSON

Chief Engineer and Engineer Maintenance of Way, Des Moines (Iowa) City Railway

During last summer the Des Moines City Railway relaid a large part of the track in the downtown or loop district of Des Moines. This included 15,147 single-track feet of new construction and almost 6000 ft. of special work, including fourteen layouts. In addition some 8 miles of track was constructed or rebuilt in the residential districts. An interesting feat in connection with this work was the fact that at least one side of the downtown streets was kept open to vehicular traffic at all times and street car traffic was continued on every line during construction work. All special-work layouts were installed under traffic with the exception of one double-crossing and four-curve layout. Working under these conditions of course greatly obstructed the free progress of the work, but it was imperative that every facility possible be given to vehicular traffic. The necessity of keeping all tracks under service also imposed certain limitations on the type of construction used.

The occasion for so general a change at one time was the complete rerouting of cars and the very bad track conditions, the latter being the result of many years' operation without a franchise and consequent lack of new funds to put into the property. Previously all cars had been routed from outlying points into the business district and there looped around and back over the same line. Under the revised plan, several lines were through routed, eliminating a lot of the congestion in the downtown section and giving better service to the public, but necessitating several new special work installations. The construction work in this downtown area was done on contract basis by the North American Railway Construction Company, while that in the residence district was done by the railway company itself.

DOWNTOWN CONSTRUCTION

A concrete base, 6 in. thick underneath the ties, was laid for the business district track, of which a cross-section is shown in one of the accompanying drawings. Weathered white oak hewn ties, spaced 2 ft. centers, were seasoned naturally as thoroughly as possible and used without treatment. The 93-lb. section No. 419 Lorain 7-in. grooved rail was fastened to the ties without tie plates by 5½-in. x 9/16-in. ordinary drive spikes, and the concrete base was carried 2 in. above the base of the rail. Over this a 1-in. layer of 1:4 cement and sand, mixed dry, was spread as a cushion for the granite paving block. This dry cushion was allowed to set naturally under the action of the elements, since by this means it rather cakes and sets less hard and less brittle. Underneath the head and groove of the rail the spaces were filled with 1:4 mortar, just stiff enough to be plastered in with a shovel before the nose blocks were placed.

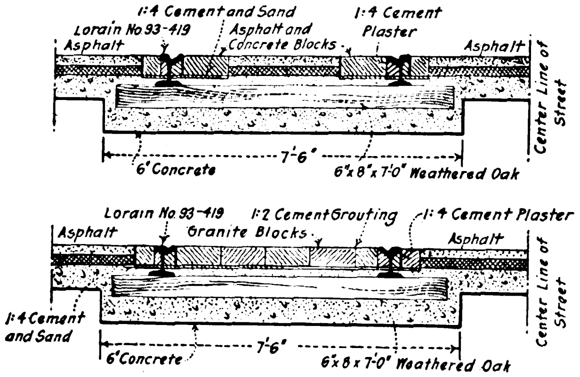
The nose blocks were then set against this mortar and long and short blocks alternated on the inside of the track to avoid a straight line joint and a tendency for rut wear at the edge of the stone in the asphalt pavement. The same arrangement of granite nose blocks on the outside of the rails was attempted, but the Mayor of the city would not approve it, and hence the straight-line joint here was unavoidable. On part of the streets and in all special work the granite block pavement was carried all the way across between rails and 5 in. outside. These granite blocks were quarried in Sioux Falls, S. D., and were specified to come within the limits of 4½ in. to 5½ in. wide, 14 in. to 7 in. long and 4 in. to 5 in. deep. After they were laid in place they were grouted in with a 1:2 mixture poured wet and allowed to settle. Tie rods of 2½-in. x 5/16-in. bars with ¾-in. terminals were installed 10 ft. apart. The rail joints were of the continuous rail type, 26 in. long and held in place by six heat-treated bolts. These bolts being of high tensile strength will not allow any stretch and hence their use practically eliminates this cause of loose joints. All joints were carefully finished with a Vixen rail planer or a reciprocating grinder and each was double bonded with Erico 500,000-circ.mil electrically welded bonds.

TAKING UP OLD CONCRETE IN DES MOINES (IOWA) BY PRYING AFTER DRILLING ROW OF HOLES 6 IN. APART WITH STEAM JACK HAMMER

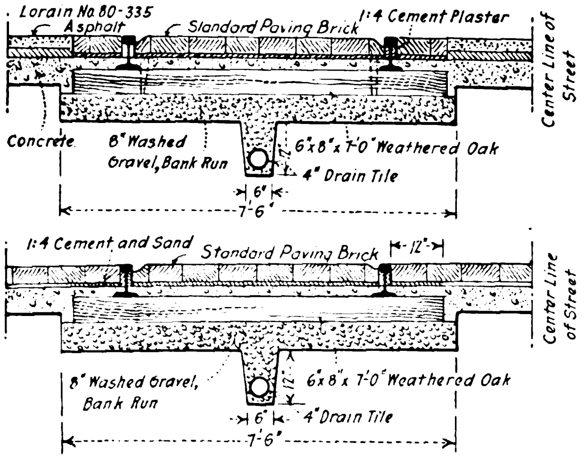
SPECIAL WORK CONSTRUCTION

The special work layouts, of which there were fourteen new or rebuilt sections, were constructed in an unusual manner owing partly to limiting conditions and partly because of the advantages the construction offered. The steel was laid on oak ties tamped up on 8 in. of crushed 1½-in. stone. Reasons for using this type of foundation were that it permits operation over it during construction work without injury to the foundation and it serves as a sort of cushion, which rather deadens the noise. It also has a tendency to increase the life because of the more flexible construction. It is easier to renew parts of special work in this type of construction than when it is necessary to dig it out of solid concrete.

The special work used was the Lorain iron-bound hard-center insert type made up with section No. 480, 114-lb. rail, which joins with the 93-lb. section, No. 419 grooved rail without a compromise joint. The inserts in this construction are bolted in place on beds machined to make a perfect bearing and with spelter poured around the edges. Solid manganese tongue switches were used and wherever these were installed as facing switches they were equipped with spring lock boxes. The flangeways over the intersection were made ¾ in. deep. This carries the weight of the city cars, which have a ¾-in. flange, equally on the tread and flange. The Interurban Railway, which also operates over these tracks, has a wheel flange ⅞ in. high, and hence the car weight is carried over the special-work intersection on the flange alone. The negative return circuit was carried around all special work by a 1,000,000 circ. mil. cable for each rail, connected to the rail by cast copper weld.


1:4 Cement and Sand
1:4 Cement Plaster
Lorain No. 93-419
Asphalt and Concrete Blocks
Asphalt
Asphalt
Center Line of Street
7'-6"
6" Concrete
6"x8"x7'-0" Weathered Oak
Lorain No. 93-419
1:2 Cement Grouting
1:4 Cement Plaster
Asphalt
Granite Blocks
Asphalt
Center Line of Street
1:4 Cement and Sand
7'-6"
6" Concrete
6"x8x7'-0" Weathered Oak

STANDARD TRACK CONSTRUCTION FOR DES MOINES (IOWA) BUSINESS STREETS


Lorain No. 80-335
Asphalt
Standard Paving Brick
1:4 Cement Plaster
Center Line of Street
Concrete
8" Washed Gravel, Bank Run
6"x8"x7'-0" Weathered Oak
12"
4" Drain Tile
6"
7'-6"
1:4 Cement and Sand
Standard Paving Brick
12"
Center Line of Street
8" Washed Gravel, Bank Run
12"
6"x8"x7'-0" Weathered Oak
6"
4" Drain Tile
7'-6"

STANDARD TRACK CONSTRUCTION FOR DES MOINES (IOWA) RESIDENCE DISTRICTS

RESIDENCE TRACK

The type of residence-district track construction in Des Moines is much the same as that already described as installed in the loop district, except for the sub-base construction. Here, instead of 6 in. of concrete below the bottom of the ties, 8 in. of bank-run washed gravel of a sandy nature, taken from a pit on the Beaver Valley Division of the Interurban Line, was laid in the track trench, which had been previously rolled. This foundation material was used in preference to crushed rock, because it has been our experience that it makes a better base and takes less skill to get a solid tamp, and also permits of a more perfect alignment. A layer of concrete 8 in. thick was laid over the sub-base after the tamping and alignment work had been completed, and then the 1-in. layer of 1:4 sand and cement dry mixture was used as a cushion under the paving brick.

The Lorain section No. 335, 80-lb. 7-in. T-rail without tie rods or braces was used on residence track, a cross-section of which is shown. Continuous rail joints were used in the residence track as in the loop district, and also the electrically welded bonds, except that a single 500,000-circ. mil bond per joint instead of the double bond necessary for the heavy traffic area was used. Each joint was ground with a reciprocating grinder before cars were allowed to operate over the rail.

The 7-ft. paving strip for each track laid by the company was paved with brick of local manufacture and locally made brick nose blocks 8 in. long were used. The space between these and the rails was filled in with the same 1:4 mortar and the whole area waterproofed with 1:2 cement grouting. A ¼-in. crown between rails was provided, with the pavement at the center on the same level as the rail top.

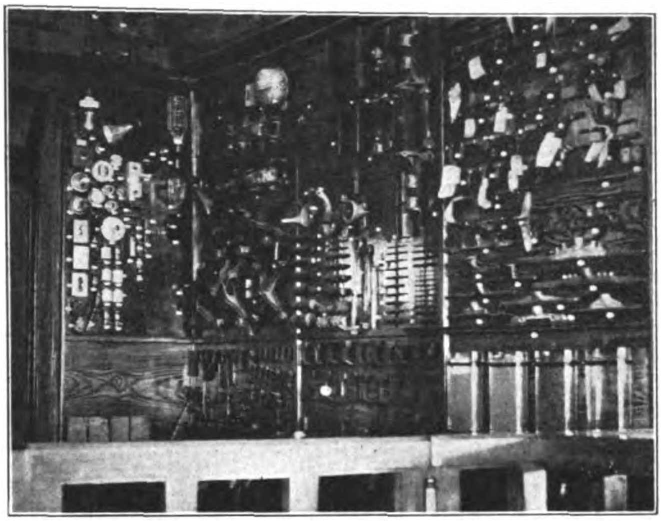
All track except that in the loop district with the concrete sub-base was constructed with a French drain, one for each track and under each curve of all special work. This drain consists of a trench 6 in. wide x 12 in. deep and filled with crushed stone. The base slopes slightly to drain to the sewer. In the gravel-ballasted residence track, a 4-in. drain tile was installed in the bottom of the trench.

In rebuilding one 2000-ft. stretch of old track, the foundation and ties were left in place and the new 7-in. 80-lb. rail put down in place of the old 6-in. 70-lb. tram rail. This raised the crown of the street to a grade 1 in. higher, and the balance of the pavement was sloped off to take care of the difference, but the work was done at a good saving over the cost of tearing up the old foundation.

The loop district tangent track was installed at a cost to the company of approximately $7 a foot of single track, this figure not including any special work or bonding cost. The residence track cost approximately $6 a single track foot. The fourteen special work layouts installed in the downtown district cost the company approximately $80,000.

Galvanized-Iron Wire for High-Tension Lines

Even before copper reached its present high price the Georgia Railway & Power Company installed a number of galvanized-iron high-tension lines where small quantities of power were transmitted. It was planned to replace them with copper when the load reached a certain size. The first installation, 6 miles in length, was in the nature of a test and as no exceptional troubles from reactance and the like were noted further installations were made. To-day about 100 miles of such lines are in use. The longest single line is 10 miles at 11,000 volts, three-phase, 60 cycles, and the power transmitted in 200 kw. The high price of copper has led to copper lines being replaced by galvanized iron in several instances where it was profitable to use the copper elsewhere. A potent reason for this practice is the fact that copper wire now costs about 36 cents per pound, whereas the galvanized-iron wire is obtainable at 93 cents per 100 ft. (13 lb.) or about 7 cents per pound.



STANDARDS MOUNTED IN ENGINEERING DEPARTMENT

Boards for Equipment Standards

The walls of the small reception room of the Denver Tramway Company engineering department have been utilized for mounting samples of the different standards of the company. It has been found that questions constantly arise as to dimensions and general details of the various devices, and by having at hand a sample which may be seen and measured and studied without going out on the work, considerable time is saved and fewer mistakes in plans made.

On this sample board are mounted sections of all the standard rails used by the company, and also the various sections of rails of all other railways with which the company has crossings. There are also angle bars used with the various rail sections, track spikes, special bolts for manganese insert work, various types of wood and stone paving block, sections of ties treated and untreated with both pressure and open-tank systems of penetration; samples of paving sand and car sand, pit-run gravel, screened gravel, various sizes of crushed slag and crushed basalt rock, etc. Covering the overhead work there are various types of hangers, ears, wire sections, return feeder cables, crossing frogs and spring frogs, various bonds, lightning arresters, pole brackets, insulators, all types of switches and sockets for indoor wiring etc.; standard signs used about the system, the moldings used in the various buildings, etc.

Inexpensive Apparatus for Registering Power House Vibration

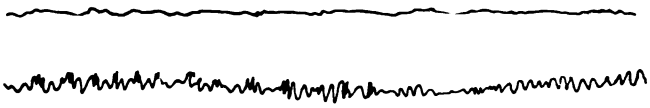
Vibrations Are Traced on Smoked Glass, from Which Blueprints are Made for Permanent Record

BY S. R. JONES

Structural Engineer J. G. White Engineering Corporation

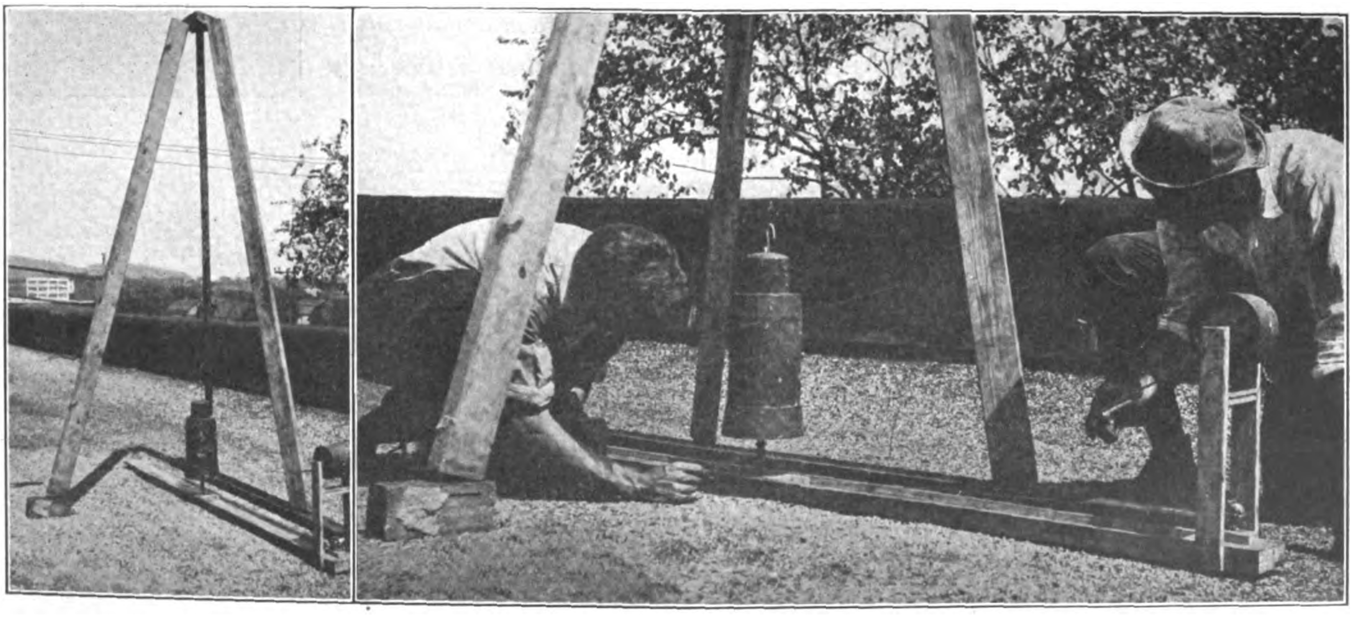
The writer had occasion recently to determine with a fair degree of approximation the severity of vibration in a power plant. As the apparatus used for delicate measurements of this kind was too expensive and unnecessarily complicated for the purpose, the simple but effective apparatus described below was devised and constructed. For the comparisons desired it proved to be amply accurate, and its portability appealed to us also. The apparatus can be made of materials available around any power plant at very slight expense.

After some experiments to determine the best weight of bob, and finding that one of 60-lb. weight was unsteady, we settled on about 120 lb. as the minimum weight which should be used. The construction of the home-made seismograph is as follows:



TYPICAL SEISMOGRAPH CURVES SHOWING DIFFERENT INTENSITIES OF VIBRATION. SCALE APPROXIMATELY ONE-HALF SIZE

The apparatus consists of a tripod about 8 ft. high made of 2-in. x 4-in. lumber hinged at the top to a triangular block. Suspended from this block on a piece of piano wire is a 117-lb. weight. At the bottom of the weight is attached a piece of gage-glass tubing in which a stylus of small-diameter tool steel is fitted. This stylus is so accurately fitted that with a lubricating film of oil between it and the glass tubing there is no lateral play. The vertical motion, however, is perfectly free. A trough is placed underneath the weight and



GENERAL VIEW OF SEISMOGRAPH ON POWER HOUSE ROOF AND NEAR VIEW SHOWING VIBRATION RECORD BEING TRACED ON SMOKED-GLASS PLATE on the foundation the vibration of which is to be measured. This trough consists of a board 6 ft. long by 6 in. wide with strips on either side. The trough contains a slide about 3 ft. long by 4 in. wide which can be drawn along slowly by means of a winding reel. To this slide is attached a strip of smoked glass 3 ft. long by 3 in. wide on which the stylus scratches a record.

The principle of the apparatus is that the weight suspended by the fine flexible wire has sufficient inertia to be unaffected by rapid vibrations and it therefore remains steady, while the smoked glass plate underneath moves with the vibrations of the ground on which it rests. Thus we get a fixed marker writing upon a moving surface. The curves represent the result of two motions, that of the vibration causing the plate to move back and forth across its main axis, and the forward movement caused by moving the smoked-glass plate along its main axis by the reeling device. Of course if there is no vibration a smooth line is obtained, while if there is vibration it is recorded by a wavy line, the maximum and minimum of which give a measure of the amount of vibration.

It is well to take the curves over periods of four minutes in order to portray any extremes which might occur due to the synchronous movement of the machines in the power house. The accompanying curves are typical of the records made with this apparatus. Both curves were taken at the same location, but more engines were being operated when the lower curve was recorded.

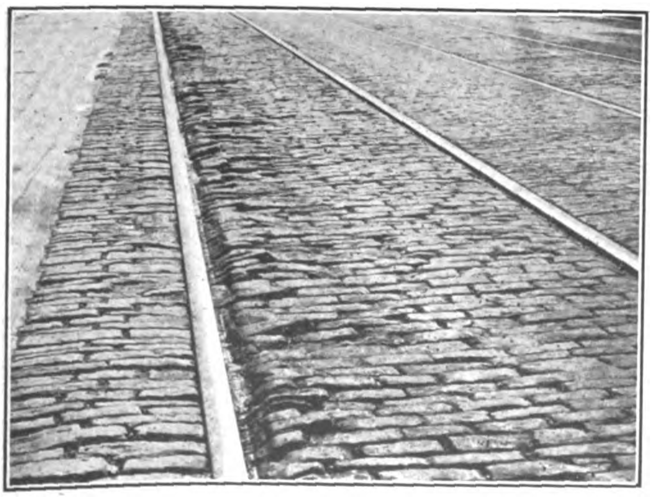
Effect of Laying Tracks to Follow Crown of Street

BY D. P. FALCONER

Engineer Maintenance of Way, New York State Railways, Rochester, N. Y.

Having one rail ½-in. higher than the other in an attempt to follow the crown of the street has been tried out in Rochester, N. Y., and found to be injurious to the pavement as well as the car equipment.

The effect on the pavement is clearly shown in the accompanying illustration, the paving block adjacent to the outer or lower rail being very uneven after being laid only one year. The wear on the side bearings, journals and wheel flanges was also found to be unusually large. After the wheel flanges became a little worn the car would run down to the low side and then abruptly be shifted back again. This nosing of the car made it rough riding and it also tended to make a wide gage track. When the attention of the city authorities was called to the disadvantages of this construction no opposition was raised to making the track level.

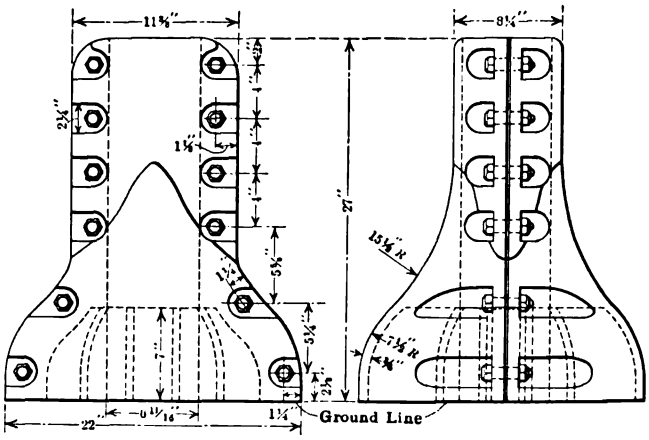


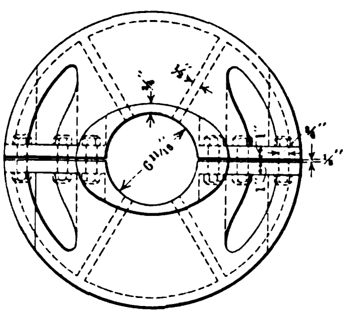
UNEVEN PAVING ALONG OUTER RAIL DUE TO ATTEMPT TO HAVE TRACK GRADE FOLLOW CROWN OF STREET

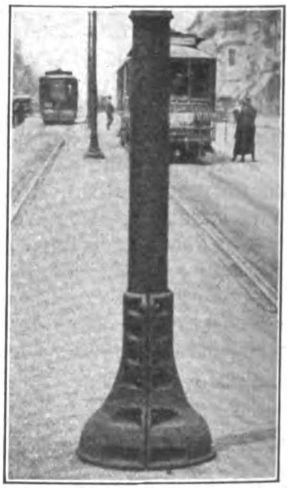
Two Ways of Reinforcing Corroded Iron Poles at the Ground Line in Richmond

In 1909 the Virginia Railway & Power Company found that a large number of its center poles on Broad Street had corroded badly about 8 in. above the ground line, to wit, at the junction of the pole and a cast-iron wheel guard. To overcome this trouble without sacrificing the poles the company devised a cuff or sleeving made up of two cast-iron reciprocal yokes. Each pair of yokes was furnished with six gripping bolts on each side, as shown, so that the yokes when joined grasped the pole firmly at points well above and below the corroded section. The efficiency of this sleeving, both as a protection against corrosion and as a wheel guard, is proved by the fact that it is still in use to-day.

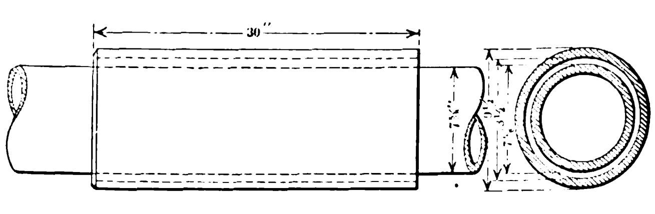
The second drawing shows a simple pole sleeving for sidewalk use, particularly for brick sidewalks. To install this it is first necessary to remove the span wire. This plain sleeving of steel tubing has also proved satisfactory as a protection against corrosion.



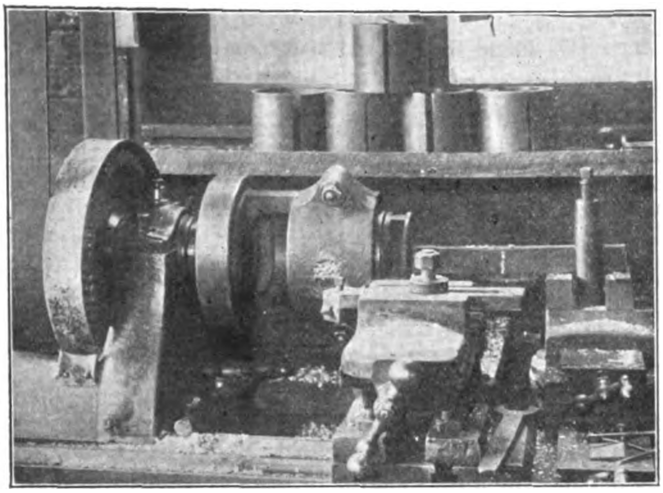




CAST-IRON SLEEVES TO PROTECT AND REINFORCE CENTER TROLLEY POLES AT GROUND LINE



STEEL TUBE REINFORCING FOR POLES SET IN SIDEWALKS



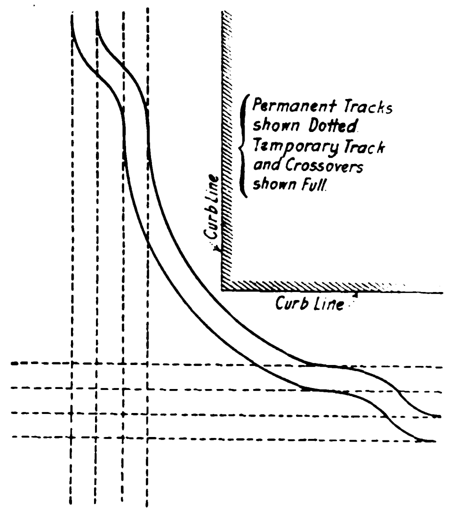
UNIVERSAL BEARING CHUCK USED IN COLD SPRING SHOP, INTERNATIONAL RAILWAY, BUFFALO, N. Y.

A Universal Bearing Chuck

In the accompanying illustration is shown a chuck used for boring bearings of different sizes. This chuck was built by the International Railway, Buffalo, N. Y., and has proved very useful in its shops. The split chuck bushings shown all have the same outside diameter, but the inside diameters are made to fit the different sizes of bearings. The bearing to be bored is inserted in the bushing of the correct size and the whole is then placed in the chuck proper. This is tightened on the bushing by means of the bolts and nuts shown. The photograph shows the two tools used in the boring operation.

Two Portable Cross-Overs and Temporary Track Around Corner Make Car Detour Possible

During the construction of the approaches of the new viaduct in Cleveland, Ohio, it became necessary to divert some of the car lines from their regular routes and this, of course, was planned so as to avoid additional expenditures in special work which would be required only during the construction period. In one instance two lines intersected with no means of interconnection between them, and it was desired to shunt the cars off the one line and turn them onto the other. This was accomplished by an unusual installation of temporary track. It comprised the installation of a left-hand double-track cross-over on one street and a right-hand double-track cross-over around the corner on the other street. The two portable cross-overs were then connected by a temporary track laid on the surface at the side of the street and curving around the corner to interconnect the two lines. Traffic was thus handled in either direction around the corner on the single track with the help of a flagman. A temporary trolley was strung over the curve and the detour arrangement thus made complete with a small permanent investment.

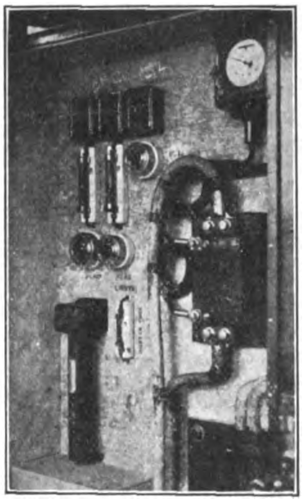

Permanent Tracks shown Dotted
Temporary Track and Crossovers shown Full
Curb Line
Curb Line

TEMPORARY TURNOUTS AND CROSS-OVERS

VIEW OF PORTION OF TEMPORARY TRACK WORK

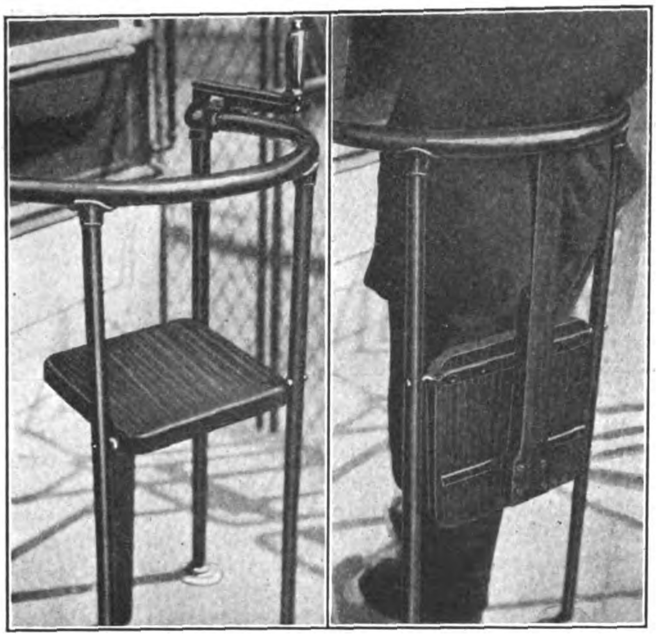
Neat Layout of Fireproof Car Control Cabinet

The control panel on the new cars of the Chicago, North Shore & Milwaukee Railroad is placed in a recess in the front bulkhead immediately behind the motorman. As shown by the accompanying illustration, the cabinet is completely lined with transite board and houses the main trolley-third-rail throw-over switch, the buzzer resistance, the switches for the compressor, headlight, car lights and sign and the Sangamo "Economy" ampere-hour meter and ammeter shunt. This cabinet extends into the car interior about 6 in. and is closed off on the platform side by a steel door lined with transite board. This makes an absolutely fireproof cabinet conveniently located relative to the position of the motorman, and makes a particularly neat layout for the fuses and switching equipment.



FIREPROOF SWITCH AND FUSE CABINET

Stone & Webster interests in Seattle have leased approximately 50 acres of upland and about 25 acres of harbor area on the north end of Harbor Island in Seattle, which, it is stated, will be the site of the proposed shipbuilding plants to be erected in the Northwest as a part of the corporation's plans to aid in government shipbuilding. The company is represented locally by the Puget Sound Traction, Light & Power Company. It is also considered probable that the plant will be located in Bellingham, where the corporation owns holdings. It is stated that the company plans to construct fifty ships at one time.



LOUISVILLE RAILWAY CONDUCTOR'S SEAT IN TWO POSITIONS

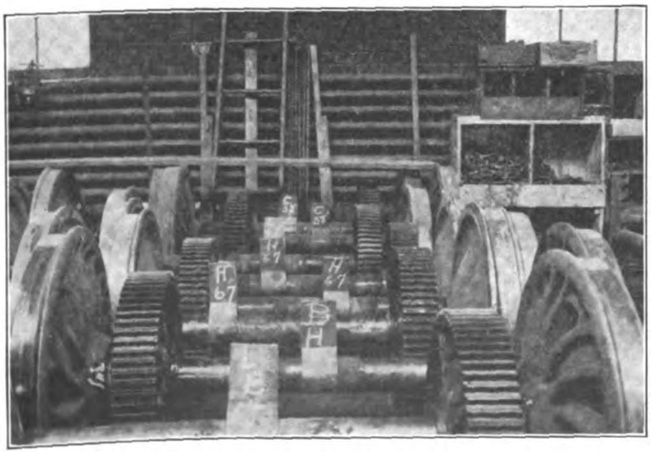
Conductor's Folding Seat

Folding seats have been installed on pay-as-you-enter cars of the Louisville Railway for the use of the conductors. The seat is of wood pivoted between two vertical members of the prepayment railing and supported at the front by a wooden leg hinged to the seat. When not in use the seat folds down between the vertical stanchions, and the supporting leg folds upward, as shown in the illustration. The seat thus occupies no platform space when not in use.

Marking Spare Axles to Save Time

A means of quickly selecting the proper spare axle and wheels without the necessity of stopping to measure journals, gears, etc., has been used to advantage in the shops of the Colorado Springs & Interurban Railway. The man who has turned the journals or done other work on the wheels and axle knows for what type of truck, motor, etc., that spare axle is fitted, and when he has finished his work on it he marks with white chalk one or two symbols on a steel spring clip which is sprung over the axle, as shown in the accompanying photograph. For instance the first tag with the letters "LB" designates this axle and wheels for a low-geared motor on a Brill truck, while the "BH" tag indicates a spare axle fitted for a Brill truck and high-geared motor; and "H-67," one for high-geared axle for use with GE-67 motors, etc.

Thus when a car comes in for axle repair, or renewal of gears or wheels, the proper spare axle and wheels can be taken from the stock and put on the car without any time being lost in measuring the proper set for replacement.

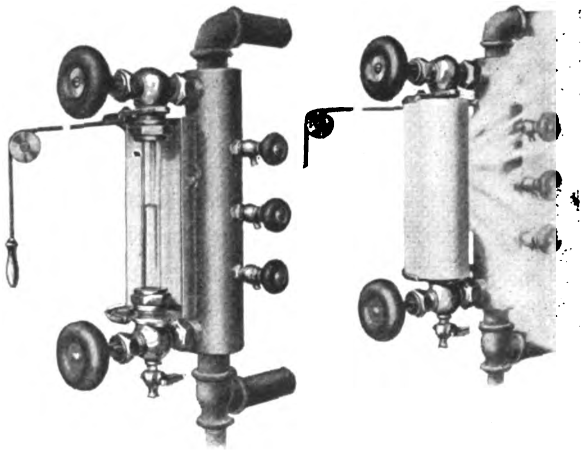


SPARE AXLES TAGGED TO FACILITATE PROPER SELECTION

Guard for Use in Replacing Broken Water Gage Glasses

To protect the operator from escaping steam when changing a broken gage glass the Simplex Safety Boiler Gage Glass Company, Springfield, Mass., has placed on the market the guard shown in the accompanying illustration.

It consists of a sheet-metal semi-cylindrical shutter mounted so that it can be rotated by pulling a cord at a distant point. In case the gage glass breaks, the operator pulls the cord, thus moving the shutter through half a turn. This deflects the escaping steam and makes it possible to shut off the gage valves without danger to the operator. This done another pull of the rope removes the shutter from the tracks on which it runs and it drops out of the way so that the gage glass can be changed. The shutter is replaced in the guarding position to protect the operator in case the new glass should break when the gage valves are opened again. When not in guarding position the shutter acts as a reflector.



TWO VIEWS OF GUARD FOR WATER GAGE GLASSES

Method for Removing Tight Wheels

A ring gas burner has solved the problem of removing extra tight wheels in the shops of the Knoxville Railway & Light Company. By means of this burner, which is 8-in. in diameter and has a double row of holes, it is possible to heat wheels sufficiently in about five minutes to make them easily removable. Before this method was used a wheel press of 80-ton capacity at times failed to remove a wheel that had been put in place at a pressure of 45 tons. In these cases it was necessary to send the wheels to a railroad shop for removal.

F. L. Hinman, master mechanic New York State Railways, Syracuse Lines, reports that the portable A-shaped shop ladders, described in the issue of the ELECTRIC RAILWAY JOURNAL for March 17, 1917, page 507, have become so popular that a dozen additional ones are being made for the carhouse inspection pits.

London Letter

The Tramway Notes This Month Are Concerned Largely with Increasing Costs and the Growing Need of Additional Sources of Revenue

(From Our Regular Correspondent)

The growing difficulty of municipal finance owing to enormously increased cost of materials may be gathered from the experience of Manchester. There, as in Sheffield, the trams have been earning more money than ever before in their history, but the amount available for rate relief has had to be cut down by one-half. The total revenue for the year was £978,000, the largest sum in the history of the undertaking. The contribution to the rate-relief fund, however, falls from £100,000 to £50,000. It is anticipated that it will necessitate an increase of 6*d.* in the pound on the rates. Materials of all kinds are costing very much more than formerly, and labor was never before so dear. War bonuses and allowances are taking from the Manchester trams £103,000 a year. Sheffield, thanks to very careful management and a constantly growing income, which now is the largest on record, has to a certain extent been more fortunate. Still, the expenditures there have mounted so much faster than the revenues that they are face to face this year with a deficiency of about £6,000, and with a probable considerably higher deficiency next year, so that some change in the scale of fares in the near future would appear to be inevitable.

With respect to tramway fares in Dundee it was decided at a recent meeting of the tramway committee that no alteration be made. The convener stated, however, that it would be necessary to consider the whole position of the tramways especially as the accepted tenders for stores for the coming year were at much higher figures of cost than the present ones. It was proposed that under the present war conditions the interest received on investments to the credit of the tramway department should, for this year and next year, be available to help to pay the interest on the remaining debt on the undertaking, any balance not required to go to the renewal fund.

The Nottingham tramways committee contemplates the adoption of several restrictions in the hope of enforcing economy. Increases of wages, the war bonuses, and the enormously enhanced cost of administration and maintenance are stated to have rendered it absolutely necessary to retrench. It has been suggested that the system of transfer tickets be suspended during the period of the war (thus apparently to stop the halfpenny fares); that the half-fare age of school children be reduced from fifteen years to twelve years and that the hour at which workmen's tickets are available be limited to 7 a. m. It is expected that these changes will meet with considerable opposition, but the finances of the undertaking have been so seriously affected by war conditions that some curtailment of facilities is deemed to be inevitable.

A special meeting of the Belfast City Council has been held to receive the recommendation of the tramways and electricity committee with regard to fares and stages for the ensuing year. The minutes of the committee contained a statement of the revenue account of the tramway undertaking for the year ended March 31, 1917. This showed that the receipts amounted to £301,245, the largest revenue on record, but that the working expenses of £189,665 were also a record. The capital, depreciation, and other charges amounted to more than £119,000. This was also a record. The net result of the year's working was a deficit of £6,892. The estimate of the city accountant for the next financial year based on present fares and expenses placed the revenue at £303,000 and the deficiency at the end of the year at £23,000. The committee recommended the abolition of all privilege tickets and free passes, with the exception of those issued to tramway employees going to and returning from duty, the withdrawal of return tickets, the limitation of work-people's tickets to before 8 a. m. and to the special workmen's cars in evening and at midday on Saturdays, and the readjustment of children's fares.

At a meeting of the Newcastle Corporation tramways committee, the application from car workers for an increase of 5*s.* a week in wages was considered. After discussion, the committee granted an advance of 4*s.* a week to motormen, male conductors, male cleaners, and others, and an advance to women conductors of 1*s.* per week extra pay at the end of six months and another 1*s.* twelve months hence. The women car cleaners on night duty are to have their wages advanced by 2*s.* per week. It was decided that the additional war bonus of 2*s.* per week to men who have worked seven days a week, and of 1*s.* to women who have worked six days, shall be continued. The increases represent an annual charge of £4,967. A further sum of £3,770 will be required to meet the advances granted to other employees as a result of the recent award of the committee on productions.

Between 4000 and 5000 women tramway workers including conductors, trolley girls and cleaners, employed by the Lancashire and the Cheshire corporations and private tramway companies have been awarded a war bonus of 3*s.* 6*d.* for workers eighteen years and over, and 2*s.* for girls under eighteen, by the committee of production. The claim made by the Lancashire Districts Council, a body representing the workers, was for a bonus of 6*s.* 6*d.*, the amount of bonus now paid to the men employed. It was contended that this claim was reasonable, because the women, on whose behalf it was made, were doing the work of men who receive the higher bonus. On behalf of the corporations and the private tramways it was urged that while the majority of the men engaged were married and had dependents, the women workers were for the most part unmarried.

The tramway committee of Edinburgh Town Council has received a letter from the Admiralty stating that it is in favor of the proposed construction by the Corporation of Edinburgh, after the war, of a tramway between Edinburgh and South Queensferry. This will be beneficial to Rosyth, and the Admiralty will support the corporation in any application for a provisional order or bill, provided there is no actual construction carried out during the war.

The London Electric Railway has applied to the Board of Trade for an extension of time in which to construct the surface railway from Golders Green through Hendon to Edgware. This line is to link up with the Charing Cross and Hampstead Tube.

Sir Albert Stanley, who in consequence of his appointment as president of the Board of Trade resigned from the companies forming the London Underground group, including the General Omnibus Company, has been succeeded by C. W. Burton, who will act as managing director. The properties include the Underground Electric Railways of London, Ltd., the Metropolitan District Railway, the London Electric Railway, the Central London Railway and the City & South London Railway.

Now that the tramways committee of the Birmingham City Council is under the necessity of still further curtailing the omnibus services in the city, owing to the shortage of petrol, a question has arisen as to the effect this reduction will have on the provision made for the conveyance of wounded soldiers. The tramway department has carried wounded soldiers free of charge on all the tramway and omnibus routes of the city, but as the vehicles were so much in demand for the convenience of persons employed in the manufacture of munitions, as well as for the ordinary traveling public, appeal was made to the authorities at the war hospitals with the result that the wounded soldiers were asked not to travel in batches of more than six.

The report concerning the working of the Liverpool Corporation electric tramways for the year 1916 shows that the total revenue was £766,577. The total operating costs were £518,037 and the gross profit, £248,540. The net profit, after making provision for interest—£49,834—and sinking fund and repayment of loans—£52,735—was £145,971. This is an increase of £22,777, as compared with that of the year 1915. The feature of the tramways is the extremely cheap system of fares. In the industrial portions of Liverpool passengers are allowed to travel 3 miles 207 yards for 1d. at all periods of the day, without restriction. During the period under review the staff was seriously depleted. Out of a total of 2700 no fewer than 1900 have left to join the forces. The vacancies thus created were as far as possible filled by men incapable of military service, or by women. This class of labor has, states the report, performed the duties as well as could be expected under the circumstances.

A. C. S.

News of Electric Railways

Traffic and Transportation
Financial and Corporate Personal Mention Construction News

Boston Elevated Obtains Some Relief

$500,000 Fund Returned by State—Bond Issue Authorized—Cambridge Subway Purchase by State Voted Down—Commission to Investigate Further

Partial relief for its financial needs was assured the Boston (Mass.) Elevated Railway by an act passed during the closing hours of the Legislature on May 25. The act provides for the return of $500,000 by the State to the company within ten days, this being a guaranty fund maintained by the railway since the early days of its rapid-transit construction. The company is authorized, subject to commission regulation, to issue bonds or notes not exceeding 20 per cent of the cash paid in by its stockholders to buy new cars, to replace or retire equipment, and to provide for the first three years' rental of the Dorchester tunnel. Such bonds or notes must be retired within fifteen years of their issue date. Land may be taken by the company for the establishment of prepayment areas, subject to the jurisdiction of the commission. An extension or rearrangement of the East Boston tunnel outlet at Maverick Square to provide for the establishment of a prepayment area is also provided for by the Legislature in this act.

PUBLIC OWNERSHIP PLAN FOR SUBWAY FAILS

A few hours before the prorogation of the session Governor McCall sent a special message to the Legislature urging that the section of the relief bill providing for the purchase of the Cambridge subway by the State be eliminated, and that the Public Service Commission be authorized to regulate the fares of the company. This involved the repeal of the 1897 act establishing a 5-cent fare unit on the Boston system. After a vigorous contest the Governor's proposed amendment was lost, the opponents contending that more time should be granted for investigation of the necessity for abrogating the company's contract with the State. As finally passed, the act provides that the Public Service Commission shall before the 1918 session investigate the advisability of granting higher fares and study the possibilities of further economies in operation.

Governor McCall pointed out that the relief bill contained a provision for the State purchase of the Cambridge subway for about $9,000,000. This obligation was to have been met by the issue of bonds bearing interest at a rate of not more than 4 per cent. At the time when the special commission on Boston Elevated financial needs reported in favor of the purchase conditions were normal. In Governor McCall's opinion, however, it might well be doubted whether the commission would have recommended the purchase if it had known that the country would be involved in a great war, with the first duty upon citizens of conserving the high credit of the commonwealth for use, if necessary, in the common defense.

GOVERNOR AGAINST PUBLIC OWNERSHIP

Quite aside from considerations growing out of the present crisis, however, Governor McCall felt that it would be an unwise policy to use the credit of the commonwealth to purchase any property of the Boston Elevated Railway. The purchase of the subway, instead of settling the difficulties of that company, would, it is likely, only involve the commonwealth, and, unless further legislation were had, might force it to take over the whole Boston Elevated Railway System. Furthermore, said the Governor, the policy upon which this bill would lead the commonwealth to embark would almost inevitably be followed by similar ventures, by an enormous increase in the public debt, and by the creation of conditions which citizens would not care to contemplate.

Regarding the extension of Public Service Commission control over the fares of the Boston Elevated Railway, Governor McCall said:

"The commission is a body created for the express purpose of supervising our transportation systems and of doing justice between those who operate them and the public. The transportation companies should be required to give rates that are just and reasonable and equal to the public. On the other hand, they should be permitted to receive rates which would enable them to pay reasonable wages to their employees, to operate their property efficiently, and to yield a return upon investments honestly made. Less than that would not pay for the fair cost of the service.

"The substantial elements in the cost of transportation upon this system can be quickly determined. There is no necessity for an inquiry long drawn out to determine the cost to the minute fraction of a mill. If the commission is equipped with full authority in the premises, I believe it will take seasonable action, and action which will receive the public approval. The maintenance of this system is of very great public importance. It has a body of highly-trained employees, led by a man who is recognized throughout the country as one of the foremost men in his calling. It gives a very good service now; it should be enabled to give even better service in the future, and I believe that it will be able to do that under the efficient management which it now has and the full regulation of the Public Service Commission."

Short Municipal Elevated Suggested

Ordinance Introduced in Seattle Council Would Provide for an Elevated Line, a Ferry Terminal and Common User Rights

An ordinance introduced by Oliver T. Erickson in the City Council of Seattle, Wash., provides for the construction by the city of an elevated railway in order to connect Division A and the Lake Burien municipal railway lines, and provide a street railway terminal for the Port of Seattle's proposed ferry line from the West Waterway industrial district. The ordinance directs the city engineer to furnish an estimate of the cost of the line suggested.

In the resolution Councilman Erickson recites that the transportation facilities on the East and West Waterways are hampered and checked in activity and growth because of inadequate transportation for their employees; that an elevated on Whatcom Avenue would be profitable because of the enormous traffic on that street and the speed which could be made in handling cars.

In announcing his plans for a greater municipal railway system for the city of Seattle Councilman Erickson stated that he favored making arrangements with the Seattle & Rainier Valley Railway whereby the cars of that system might run in the rush hours of the morning and evening along the elevated line into the heart of the shipbuilding district. He said that the municipal elevated line could be constructed at comparatively little expense provided the port commission granted permission for use of its right-of-way. The use of the Seattle & Rainier Valley Railway will cost the city $1,000 a month.

Mr. Erickson's plan is for the city to exercise common user rights over the Seattle & Rainier Valley line. Along Whatcom Avenue the plan calls for the construction of the elevated line above the right-of-way granted the Port Commission for a belt line railway. At the foot of Washington Street the plan proposes a public terminal, a slip for the West Waterway ferry, and the exchange of transfers between city lines and the Port ferry.

Salt Lake Labor Questions Settled

War-Time Adjustment Reached—Recognition of Union Waived

The differences between the Utah Light & Traction Company, Salt Lake City, Utah, and its trainmen have been adjusted. The negotiations had been in progress for weeks. The old schedule was 28 cents for the first year and 33 cents thereafter. The men demanded 37 cents the first year, 42 cents thereafter and recognition of the union. The company refused to meet either of these demands. A strike seemed imminent. Two weeks ago the county commissioners of Salt Lake County called both sides together and urged them as a patriotic duty to settle the differences by arbitrating all arbitrable matters and waiving the others during the war. Both sides accepted this principle and negotiations were renewed. On May 24 a one-year agreement was made. The wage schedule was fixed at 28 cents for the first year, 34 cents for the second year and 37 cents for the third year. The question of union recognition was waived. Both sides have agreed for one year and during the pendency of the war to refer the other differences between them to arbitration. If they are unable to agree on the question of what are arbitrable subjects, then the State Industrial Commission is to decide the matter. The labor situation has thus been satisfactorily settled for the period of the war. The question of recognition of the union may, however, come up for adjustment thereafter.

South Bend Mediation Fails

Arbitrary Stand of Men Prevents Adjustment by Board Appointed by Governor

The board of mediation in the South Bend wage matter has announced its failure to bring about any settlement. The board was appointed on May 22 by Governor Goodrich of Indiana at the request of Mayor Keller of South Bend, to try to bring about an agreement between the company and those of the striking trainmen of the South Bend city lines of the Chicago, South Bend & Northern Indiana Railway who refused to return to work under the new wage schedule and working conditions which were accepted by 80 per cent of the employees.

The board began its work at South Bend on May 23, behind closed doors. Many of the trainmen, both union and non-union men, were called and testified before the board. Charles M. Murdock, Lafayette, vice-president of the Chicago, South Bend & Northern Indiana Railway, spent several hours with the board of mediation on May 24 and informed it that the company was willing and intended fully to live up to its contract with the employees. The company's position in the controversy was that the men should return to work as individuals, and that the company could not recognize any negotiations with the union.

It was reported that the men had indicated their willingness to go back to work on a wage scale of 23 cents to 28 cents an hour graduated over a five-year period. This is 3 cents an hour higher than the wages paid before the strike of April 28. The company granted an increase of 2 cents an hour to all its employees shortly after the strike call. This was accepted by the majority of the South Bend trainmen and all the city trainmen in Elkhart, Michigan City and Goshen. The last mediation board meeting was practically a continuous session lasting from noon of May 25 to about 5 p.m. on May 26. At almost the last hour, amended demands were presented by the union men. These were rejected by officials of the company.

An attempt to bring pressure to bear on the company was seen in an order issued by Mayor Keller that the city would no longer provide special policemen for the protection of the cars and employees of the company. Cars are being operated on schedule on all lines in South Bend, and the patronage is now practically normal.

The board announced after its adjournment that the striking employees had conceded that the company should not recognize the union, but still demanded an increase of 1 cent an hour over the new schedule of 22 to 27 cents an hour which has been adopted by the company.

Hearing on Philadelphia Bills

P. R. T. Presents Its Case Before Joint Legislative Committee—Further Conferences Suggested

A hearing was held at Harrisburg, Pa., on May 29 before the joint legislative judiciary general committee to afford the Philadelphia Rapid Transit Company interests an opportunity to reply to the arguments made a week ago by the city of Philadelphia and others in favor of the pending rapid-transit measures. There are three bills before the Legislature in the interest of the city. Their purport is to give the city the power to take over the lines of the Philadelphia Rapid Transit Company by exercising the right of eminent domain, compensation to be fixed by the Public Service Commission; a constitutional amendment increasing the city's borrowing capacity so as to provide this compensation, and the so-called Salus bill to provide through routing of the city's lines on the Philadelphia Rapid Transit Company's lines and also to empower the commission to decide the question of fares and transfers.

The opinion seemed to prevail after the meeting that the measures are doomed to be defeated. Mayor Smith is reported to have urged both Senator Vare and Senator McNichol of Philadelphia to advance the Salus bill in accordance with promises which he claimed were made by the Senators to him. As opposed to this, Senator McNichol suggested that the representatives of the city and the company get together and reach an agreement. Subsequently E. T. Stotesbury, Thomas E. Mitten and Ellis Ames Ballard, of the Philadelphia Rapid Transit Company delegation at Harrisburg, made overtures to William Draper Lewis, Joseph P. Gaffney, chairman of the finance committee of the Councils of Philadelphia, and Transit Director William S. Twining of Philadelphia to the effect that the plan of Senator McNichol be put into practice.

Mr. Stotesbury opened the discussion with a statement in which he reviewed his connection with the company. He then summarized the terms of the 1907 contract and said that after ten years of operation under that contract it now became necessary as a result of the city's decision to construct additional transit facilities to amend in some respects the relation between the parties to the contract. Apart from any contractual rights in the matter, the citizens could best be served if the new city lines were operated in conjunction with the present system of the Philadelphia Rapid Transit Company. With this object in view negotiations were begun by the parties to the 1907 contract for an amendment to that contract. While these negotiations were pending bills were introduced in the Legislature to relieve the city from the obligations of the 1907 contract. The unfairness of this proceeding was obvious. He considered the breaking of one contract a poor foundation on which to build a new one.

BILLS A GROSS ABUSE OF POWER

Mr. Trinkle of counsel for the company said that it would be a gross abuse of power for the Legislature to abrogate the 1907 contract. He predicted that the passage of the bills now pending and any attempt on the part of the city to act in pursuance of the provisions of the bills would mean years of litigation leading up to the Supreme Court itself. He also attacked the feature of the bills by which the Public Service Commission is made an agency to determine valuation in a proceeding in which the city attempts to condemn transit facilities.

Mr. Schaffer for the company also opposed the eminent domain bill. He questioned, first, the constitutionality of the legislation and, second, the means by which the lines could be condemned in townships. Mr. Schaffer declared the bills to be a violation of a contract between the city of Philadelphia and the Philadelphia Rapid Transit System. The Legislature was asked to pass bills which would force the company to take conditions which the city wanted to give and none others.

It was at this point that Senator McNichol made his suggestion for further conferences. To this proposal Mayor Smith, who was not at Harrisburg, later said that any time a new proposition which looked toward an agreement between the city and the company was offered to him he was ready to receive it. He had interpreted Mr. Stotesbury's remarks made at the public hearing in Philadelphia, to which reference was made in the ELECTRIC RAILWAY JOURNAL of May 26, page 971, as purporting to mean that the present contract was the only one which the company was willing to consider.

The bills were defended for the city by Dr. Lewis. He expressed the opinion that they were constitutional and replied briefly to each of the objections raised by opposing counsel.

Detroit Arbitration Award

New Wage Scale Fixed—Representative of Men on the Board Refused to Sign the Finding

The arbitrators considering the differences between the Detroit (Mich.) United Railway and its men over the question of wages and working hours handed down their decision on May 31. The new wage scale is 30 cents an hour for the first three months; 35 cents for the next nine months, and 40 cents after the first year. The old scale was 27½ cents for the first six months; 32½ cents for the succeeding eighteen months and 35 cents after two years' service. Very slight changes were made in the working hours. The agreement was signed by John Russell, representing the company, and Judson Grenell, the umpire. Judge E. J. Jeffries, representing the men, refused to sign. The pay increase amounts to practically $600,000 a year. The advance in the wages, the increased cost of supplies and the expanding maintenance charges, etc., mean a very large increase in the expenses of the company and indicate that the days of seven-for-a-quarter tickets in Detroit are numbered.

Illinois Storm Damage

Public Service Properties in Mattoon and Vicinity Only Slightly Damaged

The recent tornado in the Central West spent considerable of its force in the city of Mattoon, Ill., and vicinity in which the Central Illinois Public Service Company, a subsidiary of the Middle West Utilities Company, operates. The president of the Central Illionis Public Service Company is M. E. Sampsell, Chicago, and he was in Mattoon continuously for several days following receipt of the news of the storm as received in Chicago. The Mattoon papers of May 28 said nothing about the damage to the railway or electric properties at Mattoon operated by the Central Illinois Public Service Company. Mr. Sampsell was not expected to return to Chicago until Decoration Day.

A telegram received on May 28 by Martin J. Insull of the Insull interests in Chicago, which control the Middle West Utilities Company, contained the only information had in Chicago at that time about the effect of the storm on the Middle West properties. This telegram said that only a very small percentage of the territory or business of the Central Illinois Public Service Company was in the storm area. In Mattoon the damage was very slight. The Mattoon plant has been operating since shortly after the cyclone. All transmission lines of the Kincaid plant west and also east of Mattoon were then in operation, and repair work had been started on the line from Mattoon to Charleston. The plant in Charleston was damaged, but it was expected to restore electric service in the Charleston plant that night (Monday). The telegram said that considering the severity of the storm, the properties of the Central Illinois Public Service Company in the storm center were very fortunate in their escape from any serious damage.

Providence Labor Conferences Continue

The agreement between the Rhode Island Company, Providence, R. I., and its employees expired at midnight on May 31, but it is asserted by union officials that the negotiations now being conducted will be continued and that a decision may be reached by July 1. In the meantime there will be no strike, it is stated, and no attempt to force a quick decision.

In the draft of a new agreement submitted by the union officials there are 130 separate sections, each taking up some point of the controversy over wages, hours, runs, working conditions, overtime, and other matters. The agreement which has now expired contained only thirty sections.

Two sessions of the conferees are held at the company's office every day except Saturday. By mutual agreement the old agreement will be continued in force until the conferees reach a decision.

Fire in Lexington.—Fire which destroyed two-thirds of a city block of property at Lexington, Ky., on May 21, entailing a loss of $500,000, in no way affected the traction, light and power service of the Kentucky Traction & Terminal Company.

El Paso Employees Admit Strike Failure.—The strike of conductors and motormen on the El Paso (Tex.) Electric Company has been called off. This was merely a formality, as the strike had long since passed into history so far as the company was concerned.

Pay of Cumberland Employees Increased.—The Cumberland (Md.) Electric Railway has entered into an agreement with its employees under which they will receive an increase in pay of 3 cents an hour. The contract is to run for two years and is to date back to May 1.

Help Difficult to Secure.—Such extreme difficulty is being experienced by the Portland Railway, Light & Power Company, Portland, Ore., in securing candidates for positions as trainmen that the offices of the employment examiner will be kept open until 9 o'clock p. m., to receive applications.

Kansas City Shopmen and Others Receive Wage Increase.—The Kansas City (Mo.) Railways has recently awarded wage increases of 2 cents an hour to many workmen in the plant, substations and shops, chiefly those who had not shared in the previous advance in wages made by the company.

Increase in Wages in Harrisburg.—The Harrisburg (Pa.) Railways has announced an increase in wages of 2 cents an hour effective on June 1 for all motormen and conductors. The company will also readjust the wages of its other employees. The maximum wage of the Harrisburg Railways for motormen and conductors is 30 cents under the new order.

Municipal Ownership Inopportune.—That the present time is inopportune for Windsor, Ontario, to adopt municipal ownership and buy the system of the Sandwich, Windsor & Amherstburg Railway, a subsidiary of the Detroit United Railway, is the opinion offered by officials of the Ontario Hydroelectric Commission to Mayor Tuson and a delegation of Windsor aldermen.

Illinois Home Rule May Not Be Passed.—There has been no news of importance on the local Chicago traction situation as it now stands before the State Assembly as reviewed in the ELECTRIC RAILWAY JOURNAL of May 19, page 927, except accumulating evidence to indicate that the home rule bill will probably not be passed. As pointed out previously, further progress in the solution of the Chicago problem depends upon the action of the Legislature.

Increase in Wages in Elmira.—The trainmen in the employ of the Elmira Water, Light & Railroad Company on its lines in Elmira, N. Y., Horseheads and Elmira Heights have had their wages increased 10 per cent at an additional yearly expense to the company of between $17,000 and $18,000. In the past the men received from 21½ cents an hour the first year to 25½ cents for the fifth year. The new scale provides for the payment of 24 cents the first year and 28 cents the fifth year.

Tripper Controversy Settled.—The differences between the New York State Railways and the Amalgamated Association over the question of tripper operation have been settled. Hereafter men on extra runs will receive a minimum of six hours' pay a day, and regular men on short runs will receive a minimum of nine hours' pay a day. The agreement covered by these conditions was reached between James F. Hamilton, general manager of the Rochester lines of the company, acting as arbitrator for the company, and James E. Roach, general organizer of the American Federation of Labor, arbitrator for the men. Messrs. Hamilton and Roach settled the matter in conference between themselves without the need of a third member, as provided in the arbitration agreement.

Wage Increase, Insurance and Pensions Announced.—Notice was posted on May 20 in the carhouses of the Duluth (Minn.) Street Railway that wages will be increased, life insurance furnished free of charge, and pensions granted to the employees. All employees who have been with the company one year or more will receive the life insurance policies. Each policy will be equal to one year's salary of the employee insured. All employees of the company of more than one year's service will be granted an extra war bonus check each pay day in the future, the amount to be equal to 5 per cent of the employee's regular check. Employees of less than one year's service will receive extra pay equal to 10 per cent of their salary. The increase in pay will continue during the present era of extraordinary prices. The details of the pension plan will be announced later.

Test of Validity of Cincinnati Grant Proposed.—On request of the Cincinnati (Ohio) Rapid Transit Commission, Prosecuting Attorney John V. Campbell of Hamilton County will bring quo warranto proceedings in the Ohio Supreme Court to test the validity of the act and ordinance under which the commissioners are to operate in leasing the proposed rapid-transit loop to the Cincinnati Traction Company. This step was taken to eliminate once for all the legal attacks that have been made from time to time. Mr. Campbell notified the board that he will make the commission, the Cincinnati Traction Company and the Cincinnati Street Railway parties defendant in the proceedings. He also requested that attorneys for the commission notify counsel for the railways so that they may be prepared to present their side of the case when a hearing is called, presumably some time in June.

Wage Increases on I. T. S.—The Illinois Traction System has voluntarily granted an increase in wages amounting to 10 per cent to city trainmen employed on its local street railway lines in Danville, Decatur, Champaign-Urbana and Bloomington, Ill. The present contracts with employees in these cities were not to have expired until Aug. 1, 1918. The new schedules are for a term of two years. They provide for a nine-hour day, and the wage is divided into six steps, increasing year by year until after the fifth year of service. In granting the increase the company urged the men to observe greater economy and care than ever in the operation of cars. The Peoria, Ill., trainmen have made a new agreement with the same company, effective from May 1, 1917, as follows: First-year men, 28 cents an hour instead of 23 cents; second-year men, 29 cents instead of 26 cents; and third-year men and those in succeeding years, 33 cents instead of 29 cents.

Emergency Increase in Wages in Louisville.—Effective as of May 16, the Louisville (Ky.) Railway has granted a special advance of 7½ per cent in wages to carhouse foremen, their assistants, line inspectors, motormen and conductors, who work on the hourly or daily basis or whose salaries are less than $100 a month. This will be in the form of a bonus on wages earned and will be payable on each of the semi-monthly pay days. The step is purely an emergency measure to help the employees named to meet the high cost of living. In making the announcement Samuel Riddle, superintendent of transportation, said: "While the company is itself burdened with an operating cost that has risen to unprecedented heights by reason of increased price of practically every commodity that figures in its business, it has authorized this emergency bonus in consideration of the equally pressing living problem that confronts its employees. It is hoped to continue the bonus during the war or so long as the business of the company will permit. Therefore it is highly important to have the hearty co-operation of every employee in protecting the interest of and reducing expense for the company."

Programs of Association Meetings

Railway Signal Association

A stated meeting of the Railway Signal Association will be held on June 12 and 13 at the Hotel McAlpin, New York City. At this meeting committee reports will be presented on the subjects of signaling practice, standard design, and electric railways and a.c. signaling. A special committee will report upon the harmonizing of existing specifications, and a progress report will be presented by another special committee on the subject of signaling requirements of electric railways, the latter committee having been organized to co-operate with a committee from the American Electric Railway Association.

American Institute of Electrical Engineers

Discussion at a meeting of the board of directors of the American Institute of Electrical Engineers, held in New York on May 18, showed that on account of the national situation many of the active members who usually attend the annual convention would not be able to spare the time this year to go to the proposed four-day meeting at Hot Springs, Va. In view of this fact the directors decided that it would not be feasible to hold the proposed convention at Hot Springs. It has been decided, however, to hold a special two-day meeting in New York on June 27 and 28, for presentation and discussion of papers that were to have been presented at the annual convention.

Central Electric Railway Accountants' Association

The thirty-first meeting of the Central Electric Railway Accountants' Association will be held at the Hotel Anthony, Fort Wayne, Ind., on June 8 and 9. The session on June 8 will be called at 10 a. m. The following reports will be presented: Report of executive committee, report of standing committee on passenger and freight accounts, and report of clearing house committee. At the afternoon session the following addresses will be made:

"Proper Classification for Light and Power Accounting," by A. E. Dedrick, auditor of the Youngstown & Sharon Street Railway, Youngstown, Ohio.

"Work Order Systems, Railway and Light and Power," by A. C. Van Driesen, chief accountant of the Toledo Railways & Light Company, Toledo, Ohio.

The report of the committee on electric light and power accounting will also be presented at this session.

The session on June 9 will be called at 9.30 a. m. The following addresses will be made:

"Maintaining a Light and Power Construction Department," by Karl A. George, auditor of the Indiana Railways & Light Company, Kokomo, Ind.

"Need of Raising the Standard of Qualifications of Men Employed in the So-called Minor Positions of Railway Organizations," by B. H. Jacobs, assistant auditor of the Cleveland (Ohio) Railway.

Central Electric Railway Association

The letter of C. N. Wilcoxon, president of the Central Electric Railway Association, to the members canceling the summer meeting of June 22-25, was dated May 24. His statement was concluded in part as follows:

"In conformity with the pledge made by the association to the President at the annual meeting of the association in March, it devolves upon the electric railways in these times of stress to devote their endeavors to the preparation of their systems for the increased demands, both military and industrial, which in all probability will be made upon them.

"The government is likely at any time to call upon the manufacturers, whose representatives are members of this association, in the furtherance of its military plans, and require their expert assistance in the great struggle which we are now facing.

"The executive committee in canceling the summer meeting does not contemplate that the Central Electric Railway Association will be of any less value to its members in the future than it has been in the past, but that its energy and resources will be applied to the various problems which the present crisis has given and will give rise to.

"Meetings of the executive committee will be held from time to time, upon proper call, to consider subjects of value to the association and to direct its affairs. Whether a business session of the association will be held later will depend upon the trend of events and the opinion of the executive committee."

Financial and Corporate

Annual Report

Portland Railway, Light & Power Company

The comparative income statement of the Portland Railway, Light & Power Company, Portland, Ore., for the calendar years 1915 and 1916 follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Gross earnings	$5,483,109	100.0	$5,511,345	100.0
Operating expenses	2,521,606	46.0	2,542,278	46.1
Taxes	516,648	9.4	531,351	9.6
Total	$3,038,254	55.4	$3,073,629	55.7
Net earnings	$2,444,855	44.6	$2,437,716	44.3
Interest	2,131,287	38.8	2,160,603	39.2
Bridge rentals	46,970	0.9	47,752	0.9
Total	$2,178,257	39.7	$2,208,355	40.1
Surplus	$266,598	4.9	$229,361	4.2

The gross earnings of the company during 1916 decreased $28,236 or 0.5 per cent, but the operating expenses and taxes dropped $35,375 or 1.2 per cent, this being due to decrease of $20,672 or 0.8 per cent in operating expenses and $14,703 or 2.8 per cent in taxes. As a result the net earnings gained $7,139 or 0.3 per cent. Interest decreased $29,316 or 1.4 per cent, and the surplus for the year showed a gain of $37,237 or 16.2 per cent.

In the annual report for 1915 an increase in earnings was predicted, based upon the strong indications of better business conditions which prevailed at the time of making the report. Immediately following the disastrous storms of January and February, 1916, there was a noticeable improvement in earnings of both the railway and electric departments. This improvement bore every indication of permanency, but in May the business depression settled down again and the company showed further decreases in earnings throughout the summer. Because of the long-continued depression Portland lost not less than 10 per cent of its population during the year ending with August, 1916.

In the aututmn, however, conditions began to improve. This improvement has continued. The surplus for January, 1917, was $47,704, as compared with $15,494 for January, 1916, and for February, 1917, the surplus was $35,749, as compared with a deficit of $24,926 for February, 1916.

Jitney competition still exists in the railway department, although the number in operation has been considerably reduced. The maximum number of jitneys operating in Portland was 363 on Dec. 15, 1915. During the last twelve months the greatest number counted on any one day was 272 on Feb. 9, 1916. Excluding two days when there were heavy snowfalls, the smallest number was 152 on Jan. 31, 1917. Notwithstanding the continued presence of the jitneys, the increase in passenger earnings of the city railway lines for the three months ending Jan. 31, 1917, amounted to $70,585, or almost 10 per cent above the same months of the previous year.

The annual report states that there is every reason to believe the earnings of the city railways will continue to increase, chiefly because of the resumption of general business activity, the practical elimination of the non-employment problem, the steady increase in population commencing last fall, and the prospect of further reduction in the number of jitneys due to regulation and the demand for labor. Freight traffic is showing a decidedly healthy increase and promises a much better showing for 1917. This is due to the development of carload freight of a class not easily handled by motor trucks.

Expenditures for extensions and betterments to property during 1916 were as follows: Railway extensions and improvements, $136,158; cars, $8,174; power plants, substations, etc., $36,635; customers' installations, $266,945; Salem gas plant $2,705; real estate and buildings, $30,045, and miscellaneous, $7,059. Total, $487,721.

Merger of New Jersey Companies

The Board of Public Utility Commissioners has approved the application of the Jersey Central Traction Company and the Central Jersey Traction Company for permission to merge as the Jersey Central Traction Company. The capital stock of the Central Jersey Traction Company will be canceled as a result of the consolidation. The Jersey Central Traction Company operates the electric railways in Monmouth County between South Amboy, Keyport, Red Bank and Atlantic Highlands.

In order to conform to the general wishes of the Utilities Commission, by divorcing, so far as possible, the traction from the lighting business, the new company proposed to that body that it give its permission to the company to sell to the Monmouth Lighting Company the power station, transmission lines and substations, and also the stocks, bonds and construction debts of the Middlesex & Monmouth Electric Light, Heat & Power Company. The total value to be transferred in this manner would amount to $701,200. This permission has been granted, upon the condition that the Jersey Central Traction Company will use the proceeds from the sale to retire outstanding securities.

Finally the Board of Public Utility Commissioners announced that it had decided the application of the consolidated company for approval of a mortgage amounting to $5,000,000, the issuance of bonds of a par value of $800,000. and the issuance of preferred stock to the amount of $600,000 and common stock to the amount of $1,000,000, by approving the creation of the $5,000,000 mortgage; the $800,000 bond issue; $600,000 in preferred stock, and common stock to the amount of $531,400.

In another report the board decided it would approve the application of the Monmouth Lighting Company and the Middlesex & Monmouth Electric Light, Heat & Power Company to merge and consolidate. The result will be to divorce the electric lighting business from the traction business and put the control of the generating plant and the substations in the hands of the lighting company.

Reduction in Light and Power Rates

The Public Service Commission of Oregon on May 21 issued an order affecting residence lighting and commercial power rates of the Portland Railway, Light & Power Company, to become effective within twenty days. One important feature of the rate reduction lies in the fact that while the minimum lighting charge stands at $1, as at present, the consumer of residence lighting will receive 1½ kw.-hr. more service for the minimum charge than he now does. Franklin T. Griffith, president of the company, said that the probable effect on the revenues of the company had not been estimated, but that the loss certainly would be not less than $50,000 a year.

On April 30 the commission, after valuation proceedings lasting more than three years, handed down its decision fixing the value of the railway, electric utility and gas utility divisions of the company for rate-making purposes. The total, as fixed for all three, was $46,862,972. As noted in the ELECTRIC RAILWAY JOURNAL for May 12, page 885, this was divided as follows: Railway, $27,159,021; electric utilities, $19,492,152; Salem gas utility, $211,798.

"No Par Value" Bill Signed

Governor Whitman of New York has signed the Walters-Pratt bill, which affords an easy and effective method of changing the shares of stock of an existing corporation from stock having a fixed par value to shares having no par value. The bill adds five new sections to the stock corporation law. Sections 19 to 23, inclusive, of the stock corporation law, enacted at the instance of the New York State Bar Association in 1912, permitted the inclusion in the original charter of corporations thereafter formed or reorganized of a provision for the issuance of shares without par value. It failed, however, to provide any method by which a corporation that had already been formed could be reorganized so that it could obtain the full benefits of the new law without first going through the process of dissolution. The popularity of the "no par value" features of New York's corporation law is shown by the revenues which have been derived from fees and taxes on the organization of corporations of this particular type, already reaching a sum in excess of $1,500,000.

Bonds to Purchase Street Railway

Toledo Committee Wants to Put Purchase of Railway Property Before Voters

The committee on rules and by-laws of the City Council of Toledo, Ohio, has approved a resolution which provides for submission to the voters at the August primaries of an amendment to the city charter that proposes to legalize the issuance of negotiable bonds and pledge the taxing power and general credit of the city as security. It also contains a provision for asking the voters to approve a bond issue of $3,000,000 at the November election, the proceeds to be used in the purchase of the street railway property of the Toledo Railways & Light Company.

Boston (Mass.) Elevated Railway.—As noted on page 1018 elsewhere in this issue partial relief for its financial needs was assured the Boston Elevated Railway by an act passed during the closing hours of the Legislature on May 25. The act provides for the return of $500,000 by the State to the company within ten days, this being a guaranty fund maintained by the company since the early days of rapid-transit construction.

Buffalo, Lockport & Rochester Railway, Rochester, N. Y.—A. S. Muirhead, W. H. Nesbitt and R. C. Vaughan, Toronto, Ont., have been elected directors of the Buffalo, Lockport & Rochester Railway to succeed E. R. Wood, F. A. Dudley and C. D. Beebe.

Cape May, Delaware Bay & Sewell's Point Railway, Cape May, N. J.—A dispatch from Cape May to the Philadelphia *Public Ledger* of May 30 said that the Cape May, Delaware Bay & Sewell's Point Railway, extending along the beach front from Sewell's Point to Cape May Point, which was sold at receiver's sale in April, has been taken over jointly by the Pennsylvania Railroad and the Philadelphia & Reading Railway. The road has not been operated since last September, when the receiver was appointed. It is expected to resume service about June 15.

Hagerstown & Frederick Railway, Frederick, Md.—The Maryland Public Service Commission has approved the readjustment of the finances of the Hagerstown & Frederick Railway, recently sanctioned by the stockholders and referred to in the ELECTRIC RAILWAY JOURNAL of May 19, page 934, and May 12, page 891.

Interborough Rapid Transit Company, New York, N. Y.—The New York Public Service Commission for the First District has adopted an order permitting the Interborough Rapid Transit Company to sell $11,436,000 face value of 5 per cent gold bonds under that company's first and refunding mortgage. The proceeds of the bonds are to be utilized toward meeting increased expenditures over estimates of 1913 in connection with the third-tracking of the elevated railroads in Manhattan and the Bronx. The original application of the company was for $16,436,000, but $5,000,000 of this sum was not allowed at the present time for reasons advanced at length in the opinion approved by the commission.

Interurban Railway & Terminal Company, Cincinnati, Ohio.—Common Pleas Judge Cushing, at Cincinnati, Ohio, has authorized the abandonment of the Interurban Railway & Terminal Company's line between New Richmond Pike and Three-Mile Road, near Cincinnati and the village of Bethel in Clermont County, and has ordered Receivers Charles M. Leslie and Charles S. Thrasher to sell the tangible assets of this portion to the Clermont Construction Company, which owns a controlling interest in the Cincinnati, Georgetown & Portsmouth Railway. Bondholders had agreed to the sale, as several years' operation by the receivers had been unsatisfactory in the way of income. Business interests and residents along the line threatened to appeal to the higher courts, but Judge Cushing announced that the appeal bond would be $25,000 in case it was desired to take such action. The court advised that the matter of another line be taken up with the Cincinnati, Georgetown & Portsmouth Railway. Under the terms of the purchase payment is to be made by the transfer of $240,000 of the first mortgage bonds and $433,000 of the common stock of the Cincinnati, Georgetown & Portsmouth Railway, taken at par.

Jefferson County Traction Company, Beaumont, Tex.—An election will be held at Beaumont on July 10 to vote on the proposed merger of the Beaumont Traction Company, the Beaumont Electric Light & Power Company and the Jefferson County Traction Company, to which reference was made in the ELECTRIC RAILWAY JOURNAL of April 28, page 799.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—The application of the Kansas City, Kaw Valley & Western Railway to issue $66,000 in first-mortgage bonds, $41,500 in general mortgage bonds and increase its capital stock $58,000, has been denied by the Kansas Public Utilities Commission. The Kansas City, Kaw Valley & Western is building from Kansas City to Topeka. It was discovered, after the utilities commission had given it permission to issue bonds with which the line from Bonner Springs to Lawrence was to be constructed, that the line was 3½ miles longer than was supposed. The application for an increase in the amount of securities applied for originally was asked because of this and for the building of sidetracks and switches. The company wanted the same amount for sidetracks as for the main line. The commission considered this requested increase excessive and denied it.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio—The stockholders of the Mahoning & Shenango Railway & Light Company will vote on June 14 on the question of ratifying a proposition looking toward the consolidation of certain subsidiaries for the purpose of eliminating unnecessary taxation. The proposal is entirely in the interest of intercorporate simplicity. The companies to be merged into the Mahoning & Shenango Railway & Light Company are the Mahoning Valley Southeastern Railway, the Poland Street Railway, the Youngstown Park & Falls Street Railway and the Youngstown & Sharon Street Railway.

Mansfield Public Service & Utility Company, Mansfield, Ohio.—New officers for the Mansfield Public Service & Utility Company have been elected as follows: S. N. Ford, president; Fred Hertenstein, formerly president, vice-president; P. Barnhart, secretary-treasurer. Mr. Barnhart will also act as manager, in which capacity he will succeed S. A. Foltz, formerly secretary, treasurer and general manager. The elected officers and Reid Carpenter and Henry Hoppe are the directors.

Monongahela Valley Traction Company, Fairmont, W. Va.—The Fairmont *Free Press* of May 17 said: "A new plan for the consolidation of the Kanawha Traction & Electric Company and the Monongahela Valley Traction Company was adopted at the annual meeting of the latter corporation held yesterday afternoon. It was discovered that differences existing between the West Virginia and Ohio laws would not permit of the consolidation of the companies under the first plans. The Parkersburg properties will probably be taken over by the Monongahela Valley Traction Company on July 1 instead of June 1, as was first planned." The terms of the merger as proposed originally were published in the ELECTRIC RAILWAY JOURNAL of March 31, page 615.

New York, New Haven & Hartford Railroad, New Haven, Conn.—The bill authorizing the New York, New Haven & Hartford Railroad to issue not more than $50,000,000 of 7 per cent preferred stock at not less than par to pay indebtedness has passed both houses of the Connecticut Legislature and is now before the Governor. The company has also been authorized by the Massachusetts Legislature to continue to own and control the securities of certain companies now in its treasury, provided it performs certain duties imposed by the act. Among the companies so included are the New York, Westchester & Boston Railway and the Providence, Warren & Bristol Railroad. Under the act any Massachusetts street railway which connects with any one of four roads mentioned as owned by the New Haven and situated in Connecticut may purchase or lease such line of railway with which it connects under conditions set down in the present act.

Northern Electric Railway, Chico, Col.—The reorganization committee of the Northern Electric Railway has declared the amended plan of reorganization operative inasmuch as it had been agreed to by a majority of all of the deposited bonds. It was further decided that a penalty of $10 a bond would be exacted from all bondholders who failed to deposit their bonds on or before May 25. Charles M. Levey, president, and John F. Bowie, attorney for the Western Pacific Company, told the committee on May 10 that their company was prepared, if the Railroad Commission should approve, to enter into negotiations for the purchase of the Northern Electric Railway. The reorganization committee has appointed the following sub-committee to consider the proposal: Frank B. Anderson, John S. Drum, John D. McKee, James K. Moffitt and Philip I. Manson.

Port Arthur (Tex.) Traction Company.—The Port Arthur Traction Company has filed in the county clerk's office at San Antonio a first mortgage deed of trust covering all of its property, in favor of the Dayton Savings & Trust Company, Dayton, Ohio, to secure the issuance of $400,000 of first mortgage sinking fund 5 per cent gold bonds. According to the San Antonio *Express* is was announced that the filing of the deed was merely the recording of a transaction made several years ago, which was not properly recorded.

Public Service Railway, Newark, N. J.—The New Jersey State Board of Public Utility Commissioners has approved an equipment trust agreement between Arthur E. Newbold, Philadelphia, Pa., and the Public Service Railway, controlled by the Public Service Corporation of New Jersey. The agreement is for the leasing to the company of 150 trolley cars. The company was to pay $248,500 advance rental on June 1, with a specified semi-annual rental thereafter, beginning on Nov. 30 next. The Philadelphia Trust Company is the trustee under the mortgage securing the cars.

Standard Gas & Electric Company, Chicago, Ill.—The Standard Gas & Electric Company has redeemed, through its sinking fund, an additional $975,500 of convertible sinking fund 6 per cent bonds of an issue of $10,300,000 dated Dec. 1, 1911, and due in 1926. The total amount of these bonds canceled to May 19 is $4,369,500, leaving outstanding a balance of $5,930,500.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The New Jersey Board of Public Utility Commissioners has authorized the Trenton & Mercer County Traction Corporation to issue $66,000 of 5 per cent notes to the Mechanics' National Bank, Trenton, to provide funds to be applied to the purchase of ten new cars.

Washington Water Power Company, Spokane, Wash.—The New York Stock Exchange has added to the list $1,700,000 of first refunding mortgage sinking fund 5 per cent thirty-year bonds of the Washington Water Power Company due July 1, 1939, with authority to add on or before Jan. 1, 1918, $539,000 of additional bonds of that issue, making the total amount authorized to be listed $7,974,000. The funds covered by the new bonds were used for permanent improvements, extensions and additions.

Waycross Street & Suburban Railway, Waycross, Ga.—H. H. Burnet, receiver of the Waycross Street & Suburban Railway, is advertising the property of the company for sale under foreclosure on June 5 to the highest bidder, subject to confirmation by the court. Ten per cent of the highest bid made is to be deposited with the receiver in cash or in the form of a certified check. The property is described by the receiver as consisting of 9 miles of electric railway, nine cars, a carhouse and lot located in Watrusco, Winona Park pavilion and appurtenances and all the rights and privileges under the unexpired term of the fifty-year franchise of the company.

West End Street Railway, Boston, Mass.—The Massachusetts Public Service Commission has approved an issue of thirty-year 6 per cent bonds of the West End Street Railway to an amount not exceeding at par $1,581,000. The proceeds of the new issue will be used to refund a similar amount of bonds which will mature on Aug. 1.

Dividends Declared

American Railways, Philadelphia, Pa., $1, common.

Frankford & Southwark Passenger Railway, Philadelphia, Pa., quarterly, $4.50.

Indianapolis (Ind.) Street Railway, 3 per cent.

Northern Ohio Traction & Light Company, Akron, Ohio. quarterly, 1¼ per cent, common.

Public Service Corporation of New Jersey, Newark, N. J., quarterly, 2 per cent.

Rochester Railway & Light Company, Rochester, N. Y., quarterly, 1¼ per cent, preferred.

Second & Third Streets Passenger Railway, Philadelphia, Pa., quarterly, $3.

United Railways & Electric Company, Baltimore, Md., 2 per cent, preferred.

Washington Railway & Electric Company, Washington, D. C., quarterly, 1¼ per cent, preferred; quarterly, 1¾ per cent, common.

Electric Railway Monthly Earnings

ATLANTIC SHORE RAILWAY, SANFORD, ME.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$27,158	*$24,269	$2,889	......	......
1 " "	'16	23,575	*20,703	2,872	......	......

CITIES SERVICE COMPANY, NEW YORK, N. Y.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$1,609,012	$30,887	$1,578,125	$225	$1,577,900
1 " "	'16	638,491	20,670	617,821	41,631	576,190
12 " "	'17	14,361,932	278,810	14,083,122	86,510	13,996,611
12 " "	'16	5,303,883	181,231	5,122,652	459,333	4,663,319

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar.,	'17	$38,254	*$24,322	$13,932	$11,389	$2,543
1 " "	'16	32,533	*19,987	12,546	11,046	1,500
3 " "	'17	107,053	*68,047	39,006	34,262	4,744
3 " "	'16	93,355	*56,469	36,886	33,158	3,728

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar.,	'17	$1,558,538	*$971,164	$587,374	$431,079	$156,295
1 " "	'16	1,353,713	*723,071	625,642	423,203	202,439
12 " "	'17	17,545,338	*9,939,686	7,605,652	5,084,279	2,521,373
12 " "	'16	15,192,163	*8,095,324	7,096,839	4,659,042	2,437,797

GRAND RAPIDS (MICH.) RAILWAY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar.,	'17	$112,738	*$75,658	$37,075	$17,456	$19,619
1 " "	'16	107,618	*67,418	40,200	14,086	26,114
12 " "	'17	1,310,494	*855,330	455,164	196,711	258,453
12 " "	'16	1,200,414	*829,505	370,909	167,168	203,741

KANSAS CITY (MO.) RAILWAYS

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$597,399	*$443,804	$153,595	$129,769	††$41,518
1 " "	'16	575,707	*381,296	194,411	116,375	††52,586
10 " "	'17	6,151,930	*4,125,703	2,026,227	1,300,870	††399,431
10 " "	'16	**				

LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar.,	'17	$132,542	*$90,386	$42,156	$34,369	$7,787
1 " "	'16	114,646	*78,281	36,365	36,356	9
3 " "	'17	380,290	*273,502	106,788	103,125	3,663
3 " "	'16	334,522	*231,759	102,763	108,791	†6,028

LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$217,984	*$139,570	$78,414	$50,935	‡$38,516
1 " "	'16	198,635	*118,243	80,392	51,637	‡39,067
12 " "	'17	2,604,278	*1,676,655	927,623	625,685	‡451,906
12 " "	'16	2,256,081	*1,328,133	927,948	645,725	‡421,133

PHILADELPHIA & WESTERN RAILWAY, UPPER DARBY, PA.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$45,645	$22,683	$22,962	$12,517	$10,444
1 " "	'16	42,802	20,156	22,646	12,525	10,121
12 " "	'17	529,604	256,999	272,605	150,479	122,126
12 " "	'16	481,668	230,790	250,878	148,480	102,398

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$2,456,300	$1,382,948	$1,073,352	$813,746	$259,606
1 " "	'16	2,272,272	1,244,460	1,027,812	816,043	211,769
10 " "	'17	23,457,395	13,162,272	10,295,122	8,142,214	2,152,908
10 " "	'16	21,135,004	11,810,169	9,324,835	8,161,907	1,162,928

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$368,029	*$250,176	$117,853	$80,425	‡$47,430
1 " "	'16	327,672	*199,281	128,391	67,411	‡63,652
12 " "	'17	4,183,402	*2,565,525	1,617,877	861,749	‡762,344
12 " "	'16	3,445,206	*2,029,746	1,415,460	729,856	‡694,810

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$839,072	$534,447	$304,625	$145,402	$159,223
1 " "	'16	816,181	506,703	309,478	140,299	169,179
4 " "	'17	3,480,984	2,333,906	1,147,078	580,471	566,607
4 " "	'16	3,307,167	2,115,877	1,191,290	568,181	623,109

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*Includes taxes. †Deficit.

‡Includes addition of miscellaneous income, and deduction of Kansas City surplus reinvested in plant. **During the fiscal year to Feb. 14, 1916, the property was operated by the receivers under the old securities, and the figures for this period, being without value in a comparative statement, are not shown here.

Traffic and Transportation

Copper-Zone System to Be Tried

Massachusetts Commission Authorizes Six Months' Trial of Copper-Fare Zones—Company to Issue Commutation Books

In a formal decision issued on May 25 the Massachusetts Public Service Commission authorized the Concord, Maynard & Hudson Street Railway, Maynard, Mass., to establish for a six months' trial a copper-zone system of fares, based upon a charge of 2 cents per mile for the distance actually traveled, with a minimum charge of 6 cents. The hearing on this case was reviewed in the ELECTRIC RAILWAY JOURNAL for May 5, page 846.

The previous fare unit, 6 cents, has been in vogue since February, 1908. Under the new tariff the maximum increase will be from 6 to 12 cents, between Stow Center and Hudson. Under the former arrangement with connecting roads, transfers were interchanged, with a subsequent settlement at the rate of 3 cents each. Under the new arrangement, transfers from other companies at either end of the line will be accepted for a ride in one zone, while transfers to other railways will be issued as before. Books of coupons will be sold at the 2-cent rate, with the usual half-fare provision for school children.

In an exhaustive analysis of the company's financial condition the commission found that the depreciation reserve is wholly inadequate and that additional revenue is justified. Dividends have averaged 2.48 per cent per year since 1910. The gross income for 1916 was $83,080, and operating expenses $56,499. The capitalization on Dec. 31, 1916, was $515,000. The road is controlled by the Massachusetts Consolidated Railways, and the commission found that the management expenses are reasonable. Improved methods of power-plant operation and rolling-stock maintenance were suggested as desirable.

WHY THE INCREASE WAS JUSTIFIED

The commission was of the opinion that the company is entitled to a return of 6 per cent upon the investment represented by its stock and bonds outstanding and by one-half of the floating debt. On this basis the company is entitled to a return of $29,400 per year, which is about $8,620 below the 1916 figures, without allowing for a more adequate provision for depreciation and maintenance. At the hearing the company presented much evidence regarding recent increased costs of operation, laying special emphasis upon the advanced price of coal. In the three months ended March 31 operating revenue decreased $273 while operating expenses increased $3,247 over that period in 1916.

From the evidence it was estimated that the proposed advance in fares will not increase passenger revenue more than 16 per cent, or $12,761. The commission said that if the property is to be maintained in first-class operating condition, with adequate provision for depreciation, a greater increase would be permissible. From the standpoint of net financial results no objection can be made to the new schedule. The new system of charging, as applied to a street railway interurban in character, and operating through a somewhat sparsely settled territory with a fairly uniform density of population, seemed to be reasonable.

As a practical matter, however, the new schedule somewhat disarranges a method of charging which has been in vogue for a long period, and falls with unequal weight upon the patrons of the road. The commission felt that in the interest of the habitual rider the commutation-ticket principle should be utilized, and after conference the company has agreed to issue commutation-ticket books upon the basis of fifty-two rides for a period of one month, which will enable the purchaser to ride between any two designated points, if he uses all the coupons, at a rate equal to 75 per cent of the regular fare, where that fare is more than 6 cents.

Decisions on Free-Ride Law

Supreme Court Upholds Law in New Jersey Case—Indiana Commission Enjoined from Enforcing Order

A case brought by the Public Service Railway, Newark, N. J., against the legality of the New Jersey law enacted in 1915, covering free rides for policemen and firemen on street railway lines, was decided on May 21 by the United States Supreme Court. It was declared that the law is valid and within the exercise of the police powers of the State. This case was heard by the State Supreme Court and the Court of Errors on the company's motion that the law providing for the free transportation of such municipal employees was taking "private property without just compensation." Both of these courts decided that the law could be enforced and they are now sustained by the higher tribunal. The State holds that the free rides for policemen and firemen are part of its plan to insure for the public the greatest operating efficiency. The law provides for the free transportation of policemen and firemen while on duty, as well as plain-clothes men.

In the matter of the suit filed by the Indianapolis Traction & Terminal Company against the Public Service Commission of Indiana to enjoin the commission from enforcing an order providing for free transportation to city firemen and policemen, three federal judges in the District Court at Indianapolis issued a temporary injunction against the commission on May 25. W. H. Latta, attorney for the traction company, set forth in his argument that the law passed by the State Legislature during the last session, upon which the order of the commission was based, is unconstitutional and its enforcement would violate the franchise rights of the company. The State, represented by Attorney General Stansbury, in its argument relied principally upon the recent decision of the United States Supreme Court in the New Jersey case. The filing of the application for this injunction was reported in the issue of the ELECTRIC RAILWAY JOURNAL for May 26, page 979.

The court at Indianapolis, composed of Judges Francis E. Baker and Samuel Alschuler of the Circuit Court of Appeals, Chicago, and Judge Arthur B. Anderson of the Indiana District Court, did not pass on the constitutionality of the Indiana law, but based its decision in issuing the injunction on the question of the violation of the company's franchise contract with the city. The order of the court does not prevent the enforcement of the "free-ride" order in other cities of the State.

Ten-Cent Fare Proposed

The Danbury & Bethel Street Railway, Danbury, Conn., has announced that, owing entirely to increased operating costs, it has become necessary for it to double the present 5-cent fare for a ride from Danbury to Bethel and to Lake Kenosia. Strips of tickets will be sold at the rate of five tickets for 35 cents. These, however, will not be honored during the week of the Danbury Fair. John Sanders, president and general manager of the company, issued a comprehensive statement when the increase was announced, a part of which follows:

"The company regrets very much that it is compelled to raise its rates. This increase has been under consideration for some time, but has never been put into effect, in the hope that conditions both locally and nationally would improve. However, instead, the cost of operating has steadily increased by reason of the great advance in the price of coal, materials and labor. Coal has advanced in price from 100 to 125 per cent, and is of a quality so inferior that it is at times almost impossible to keep up steam in the power plant. Assuming that the quality of the coal is 50 per cent of what it was formerly, the operating expense for coal alone has increased 200 per cent."

Mr. Sanders enumerated the several other materials of similar high price which are used in the electric railway business, and added: "We trust that the public will realize the reasonableness of the step the company has decided upon, which was made necessary by prevailing conditions throughout the country."

Changes Proposed for Buffalo

Traffic Committee Recommends Trial of Skip-Stop Service and Other Plans to Reduce Congestion and Accidents

In a preliminary report submitted to Mayor Fuhrmann of Buffalo by the special traffic committee appointed some time ago to investigate traffic conditions in that city, the skip-stop system has been recommended for trial on Elmwood Avenue and Main Street. The committee conferred with authorities of the International Railway and found them willing to make a trial of this or any other proposition that would tend to relieve the congested condition. It was suggested that a plan be followed similar to that in other cities and that a vote be taken to ascertain the opinion of the patrons on the two lines regarding the proposed change.

The report recommended also that the railway company be requested to lay an additional track in Shelton Square to facilitate the handling of more cars there, that the island be increased in size and a shelter be erected over it. A single-track connection between Broadway and Clinton Street and other rerouting plans to reduce the traffic congestion on Washington Street south of Broadway were also recommended. In order to insure greater safety to pedestrians, it was suggested that crossing places be marked on the highways and that midway crossings be designated for long blocks.

The committee also made some suggestions pertaining to automobile traffic. It was proposed that trucks should not be allowed to carry loads projecting ahead of the front wheels, that siren whistles should be prohibited on all except vehicles used by the fire department, the police, the sheriff and authorized public utility vehicles for emergency calls, that parking privileges be denied on certain streets and that all approaches to schoolhouses, playgrounds, hospitals and firehouses be plainly marked.

California Jitneys Ask Increase

The first jitney case brought before the Railroad Commission of California under the legislative act passed recently which places the jitneys of that State under the control of the commission was heard in Los Angeles on May 25. The hearing was on an application filed by the White Bus Line, the Crown Stage Line and the Valley Stage Line which asked for authority to raise passenger rates from Los Angeles to Anaheim, Santa Ana and intermediate points. The companies say they are losing money on the present rates, which were filed with the commission when the new legislative act was passed, and which include single and round-trip fares and ten-ride commutation ticket books.

More than 500 jitney companies have filed rates with the commission to date. This is not an indication of the number of automobiles engaged in such traffic, however, because in many cases a single tariff was filed for an association of 100 or more jitney men. It is estimated that about 1000 lines are under the commission's jurisdiction, in which the proportion of passenger lines to freight lines is about eight to one.

Portland Wants Jitney Regulation

Two measures affecting jitney regulation will be on the ballot at the municipal election in Portland, Ore., June 4. One requires the jitneys to furnish a $2,500 bond for protection of passengers and pedestrians, and the other, proposed by the jitneys, eliminates all regulation and turns the streets over for free and indiscriminate use for commercial purposes. As the jitney situation stands in Portland now, there not only is no bond required, but there is virtually no regulation. The jitney men pay a license fee of $2 a month.

In the 161 jitney accidents in Portland in the last two and a half years, three persons have been killed and 191 injured. The injuries have ranged from minor cuts and bruises to permanent injuries, including broken limbs and fractured skulls. In many cases the accidents have been to people financially unable to pay doctors' bill or to lose time from work. There is no record of anyone ever having collected damages from jitney owners on account of accidents, as the drivers in general are financially irresponsible. It was largely on account of these conditions that the Progressive Business Men's Club initiated the measure to be voted on to require jitneys to furnish bonds.

Further Hearing on Closed Vestibules

On May 29 a hearing was held by the Public Service Commission of New York, First District, in connection with a provisional order requiring all surface cars operating in Greater New York to be equipped with vestibule doors, control-interlocks and folding steps by Oct. 1, 1918. The proposed order was opposed by the Second Avenue Railway on the grounds that its closed cars were already equipped with folding doors and that, of the few boarding and alighting accidents occurring on the company's closed cars, none was traceable to the existence of the fixed steps, while the value of the control-interlock appeared to be doubtful. With regard to open cars, the expense of conversion would be prohibitive, approximating $2,400 per car.

W. G. Gove, superintendent of equipment Brooklyn Rapid Transit Company, suggested that the order be held in abeyance because of the abnormal conditions now existing, labor and material for the work of conversion being practically impossible to obtain. He estimated the cost of conversion for closed cars at about $650 per car with $50 more if a bigger signal system were installed. It was a physical impossibility to equip all cars by the date mentioned in the order, not only because of shop conditions but also because of the need for protecting the service. E. A. Maher, Jr., vice-president Third Avenue Railway, opposes the extension of the order to cover all of his company's cars. Those cars on Manhattan Island are all equipped with inclosed vestibules, but the older cars and open cars on the outlying lines could be remodeled only at a prohibitive expense.

All of the witnesses testified that in buying new cars, vestibule doors with control interlock and folding steps, as outlined in the proposed order, might properly be specified. Opinion was also unanimous that open cars were not likely to be purchased on any future orders for city equipment, notwithstanding their popularity with the public and their increased earning capacity.

Trolley Car License Fee Doubled.—The City Commissioners have voted to increase the license fee of trolley cars in Atlantic City, N. J., from $50 to $100 each. An ordinance to that effect has been passed and will soon be made effective.

Roads Contract for Picnic Crowds.—The Louisville & Southern Indiana Traction Company, New Albany, Ind., and the Louisville & Interurban Railroad, Louisville, Ky., have begun filling dates for the summer picnic season. The Louisville & Southern Indiana controls an important amusement park and, in addition, has fitted up a picnic ground on Silver Hills.

Seven and Eight-Cent Fares Proposed.—The Middlesex & Boston Street Railway, Newtonville, Mass., has filed with the Public Service Commission of that State new rates showing increases from 6 cents to 7 and 8 cents which will be effective on June 25. The sale of strip tickets at the rate of nine for 50 cents will be discontinued. Fares for school children are set at one-half the new rate on the respective lines.

Hearing on Grade Crossing Order.—A hearing will be held on June 6 by the Public Service Commission for the First District of New York on a motion of Commissioner Charles S. Hervey to inquire whether an order shall not be issued to all steam railroads operating within the city of New York, and having grade crossings protected by crossing gates, directing them to keep the gates lowered from midnight to 5 a. m., except when raised to permit the passage of automobiles and other vehicles. It is believed that such an order would tend greatly to prevent grade crossing casualties inasmuch as all vehicles would be brought to a full stop.

Higher Fares Asked in Easton.—The Northampton, Easton & Washington Traction Company, Easton, Pa., operating between Phillipsburg and Port Murray, has applied to the Public Service Commission of Pennsylvania for permission to increase its rates from 35 cents to 42 cents for a single trip. The hearing on the proposed increase will be held at the State House on June 4. The company proposes to increase the rate by adding 1 cent to the fare in each of the seven zones in which the present rate is 5 cents. The distance in each zone varies from a little less than 1½ miles to nearly 4 miles, making the seven zones cover a distance of more than 17 miles.

Decision on Louisville Grade Crossing Accident.—Criminal court proceedings growing out of the grade crossing disaster in Louisville, Ky., on Feb. 12, which was reported in the ELECTRIC RAILWAY JOURNAL for Feb. 24, page 367, have come to an end. A plea of guilty to the charge of involuntary manslaughter was entered in the Criminal Court at Louisville by H. T. Jeffries, engineer on the Southern Railway train which struck the Broadway street car, this resulting in the death of four persons and the injury of more than thirty. An indictment charged Jeffries with driving his engine recklessly and without a headlight. The prosecuting attorney stated that two important witnesses were out of the jurisdiction of the court and could not be reached. He recommended that the defendant's plea be accepted.

Officials Confer in Duluth Fare Case.—The controversy involving the Duluth (Minn.) Street Railway and the city of Duluth was discussed at a conference of representatives of both sides on May 16. President A. M. Robertson of Minneapolis stated that the company would build the extension to New Duluth if assurance could be had that agitation against the present 10-cent fare to Morgan Park would be discontinued. The rails for the new extension had been ordered for delivery this year and all preparations were made on the basis of the double fare on the line to be extended. Since that time a test suit has been brought to prove the company's right to charge the double fare, as reported in this paper for May 26, page 981. In case the company receives a favorable decision in this suit before Oct. 1, it promises to have the new line in operation before the end of the year. The city commissioners declined to pledge the city to any definite action pending this decision, but it is understood that the city will prosecute the fight for the single fare.

Near-Side Stops Opposed.—An ordinance providing for near-side stops for all cars of the Colorado Springs & Interurban Railway, Colorado Springs, Col., has been passed by the City Council and was to come up for final passage on June 1. There was no opposition to the passing of the ordinance but it was the belief of officials of the company that the public, when fully informed on the subject, would make opposition. Although the company did not oppose the passage of the ordinance officially, it proposed to conduct a campaign to show inconveniences of the near-side stop system. Placards, giving reasons why the proposed change would result in unsatisfactory service, were prepared to be displayed in all the cars. An official of the company is reported to have said: "The company does not contemplate making any changes with its cars, as the near-side stop will not interfere with operation. We can stop on either side of the street, with the patrons entering the cars from the rear entrance, but considerable inconvenience will result to the patrons of the company."

Motormen to Get Bonuses for Saving Power.—The Connecticut Company has announced a plan whereby motormen on its lines in New Haven will receive cash prizes for the best power-saving record. The men are requested to cooperate in the scheme, which is intended to promote economy during the war. The announcement read, in part, as follows: "The company will award quarterly cash prizes of $3 to $10 to the motorman whose record for saving power indicates he has used the best judgment in running his car. To determine which motormen are the most efficient the cars have been equipped with power-saving recorders. Twice a month a statement will be posted in the different carhouses showing the standing of each man for the preceding two weeks. Only men on the same run or under the same conditions will be compared and all comparisons will be made on a per mile basis. Make the stops as short as possible but have regard for the safety and convenience of the public. Economy must begin only when safety has been assured. When necessary, assist the passengers in and out of cars. This is a good policy and will save time and power."

Legal Notes

FEDERAL COURT.—*Right to Use Highway Bridge—Compensation.*

Any legal right of a street railway company to use highway bridges without the county's consent and without making compensation was destroyed by the execution of a formal contract between the county commissioners and the street railway company in order to settle the controversy between them as to their respective rights in the matter, whereby the county granted, subject at all times to revocation, the right to use the bridges in consideration of the street railway company's promise to pay a specific sum per annum for the use of each bridge.

To require such a company, under such a grant, to pay one-third of the actual cost of removing the old bridges and erecting new ones before such company should be permitted to use the new structures, was within the power of the county authorities, under Ga. Laws 1914, p. 487, providing that all existing permits and franchises to operate over any of said bridges are revoked and repealed "so far as the same applies to any future bridges hereafter constructed under this or any other law," unless the street railway company will conform to the reasonable terms and conditions prescribed by the county authorities, giving the latter exclusive right and jurisdiction to grant franchise to operate over new bridges, and to prescribe terms for such grants, and empowering them to require, as a condition precedent, that any grantee shall pay to the county "one-third of the actual cost of the building of said bridges . . . but any corporation now having a franchise shall have the right to use any new bridge upon complying with reasonable conditions imposed" by the county authorities and the terms of the act. (Rome Railway & Light Co. v. Floyd County, 37 Supreme Court Rep., 291.)

NEW YORK.—*Penalty for Defective Transfer Enforceable Even When Defect Was Due to Carelessness.*

Under public service commission law (Consol. Laws, chap. 48) sec. 49, subd. 7, requiring street railway companies to carry any passenger desiring to make a continuous trip between two points for a single fare, to give him a transfer entitling him to such trip, and providing a penalty of $50 for refusal, where a passenger paid his full fare but received a transfer not punched so as to entitle him to ride in the car to which he transferred, so that he was required to pay another fare, the company was liable for the penalty, though the refusal to comply with the statute was the result of carelessness or inadvertence of its employees to carry out instructions. (Osborne v. International Railway, 164 New York, Sup., 226.)

NEW YORK.—*Mandamus of Commission Requiring Company to Build Road Denied by Court—"Duty Compelled by Mandamus Must Be Plain and Unmistakable."*

An electric light company acquired the property and franchises of a street railroad, and the Public Service Commission applied, under public service commissions law, Sec. 57, for mandamus to compel it to construct and operate a street railroad on certain additional roads and between certain additional points. The original railroad company's franchise from a town to operate on the road in question had been forfeited for non-user by the express terms of the franchise and the provisions of the railroad law. It was doubtful whether any legal obligation rested on the defendant to operate any road beyond that already constructed and operated at the time of its purchase of the street railroad in 1902. There was no proof that the city or the property owners had given their consent, or would give it, to the new railroad construction and operation. *Held*, that the Public Service Commission's application for mandamus would be denied, since the operation and duty compelled by mandamus must be plain and unmistakable and not subject to doubt. (Public Service Commission for First District v. Richmond Light & Railroad Co., 163 New York Sup., 64.)

Personal Mention

E. C. Howard has been appointed traveling freight agent of the Toledo & Western Railroad, Toledo, Ohio, to succeed W. J. Chisholm.

W. J. Chisholm has been promoted to the position of traffic manager of the Toledo & Western Railroad, Toledo, Ohio, effective June 1, to succeed A. C. Wegner, who resigned.

F. P. Gutelius has been elected vice-president of the Delaware & Hudson Company, in charge of the operating and traffic departments, with headquarters in Albany, N. Y., to succeed C. S. Sims.

F. W. Smith, who has been general storekeeper to the Ogden, Logan & Idaho Railway, Ogden, Utah, has resigned to accept a position with the Phoenix Construction Company, with headquarters at Ogden.

Henry L. Doherty was the guest at an anniversary dinner recently, the occasion being his forty-seventh birthday. The tribute to Mr. Doherty was attended by 117 members of the Doherty organization. Frank W. Frueauff presided.

John F. Wessel was recently elected a vice-president of the United Gas & Electric Engineering Corporation in charge of the Northern properties succeeding S. J. Dill, who will devote his time to the oil interests of the corporation.

L. J. Hirt, formerly vice-president of the Pearson Engineering Corporation, has been appointed consulting engineer for the United Gas & Electric Engineering Corporation and will supervise the construction and engineering work of the subsidiary companies.

H. C. Berry, heretofore superintendent of the Salem district for the Electric Company of New Jersey, will enter high-tension construction work for the American Railways, Philadelphia, Pa. L. Scott Schilling has been appointed to succeed Mr. Berry at Salem.

L. J. Miller, formerly roadmaster and superintendent of substations of the Chicago, South Bend & Northern Indiana Railway, with headquarters at South Bend, has resigned to accept a similar position with the Boston & Worcester Street Railway, with headquarters at Framingham, Mass.

A. B. Paterson, formerly manager of the Meridian Light & Railway Company, Meridian, Miss., operated by H. L. Doherty & Company, who resigned to become bond department representative of the Doherty organization at New Orleans, was the guest of honor at a farewell banquet given recently in Meridian.

F. P. Will has resigned as superintendent of the Burlingame (Cal.) Electric Railway to accept a position as general agent and warehouse foreman of the Modesto & Empire Traction Company, Modesto, Cal., effective June 1. Mr. Will has been superintendent of the former road since 1913, when it was built.

Charles Brown, who for several years was superintendent of the Dover-New Philadelphia and the Dover-Uhrichsville divisions of the Northern Ohio Traction & Light Company, Akron, Ohio, has been promoted to superintendent of the Akron City and Akron-Barberton-Wadsworth divisions. He has been succeeded by Roy Kennedy, formerly a conductor on the Tuscarawas Traction division.

George H. Storms, who for many years has been associated with the Fort Smith Light & Traction Company, Fort Smith, Ark., has been promoted to the position of auditor for the Ottumwa Railway & Light Company, Ottumwa, Iowa. Both companies are operated by H. M. Byllesby & Company, Chicago.

C. Nesbitt Duffy, vice-president of the Manila Electric Railroad & Light Company, Manila, P. I., who recently returned to the islands from the United States, has been elected president of the Friendly Sons of St. Patrick. He also had the honor of presiding at a dinner tendered some weeks ago to the visiting "American Honorary Commercial Commission."

Stephen E. Dillon, who was elected president of the Arkansas Association of Public Utility Operators at its annual convention, held on May 16-18, has been general manager of the Public Utilities of Hot Springs, Ark., since October, 1911. The water, gas, electric light and street railway properties are under his management. Previous to that time Mr. Dillon had twenty-nine years of service with steam railroads. He entered the service of the Burlington system as a messenger boy in 1881.

C. S. Sims, vice-president of the Delaware & Hudson Company, at Albany, N. Y., has been transferred to Montreal, Quebec, as resident vice-president. Mr. Sims is also vice-president of the United Traction Company, Albany, N. Y., the Cohoes (N. Y.) Railway, the Hudson Valley Railway, Glens Falls, N. Y., and the Troy & New England Railway, Troy, N. Y, all controlled by the Delaware & Hudson Company and of the Schenectady (N. Y.) Railway and the Plattsburgh (N. Y.) Traction Company.

E. J. Blair, electrical engineer of the Chicago (Ill.) Elevated Railways, who was recently commissioned captain in the Engineers' Reserve Corps, has gone into training at Fort Sheridan. Mr. Blair has been with the elevated companies since his graduation from Cornell University in 1905. Before the consolidation of these companies in 1911 he was employed in various capacities by the Metropolitan West Side Elevated Railway, for the last two years of its separate existence as electrical engineer. Mr. Blair is active in the American Electric Railway Engineering Association, and is president of the local section of the American Association this year.

Charles J. Laney, heretofore traffic manager of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, has resigned to accept a similar position with the Northern Ohio Traction & Light Company, Akron, Ohio, effective June 11. Mr. Laney was formerly employed in the freight department of the Toledo & Ohio Central Railway and of the Wabash Railroad. In 1907 he became connected with the Toledo Urban & Interurban Railway, and later with its succcessor, the Toledo, Bowling Green & Southern Traction Company. He served this road for two and one-half years as assistant general freight agent, and in 1909 was appointed traffic manager to succeed H. H. Stephenson. Mr. Laney had been traffic manager of the Cleveland, Southwestern & Columbus Railway since March, 1913.

Waldo G. Paine, vice-president and traffic manager of the Spokane & Inland Empire Railroad, Spokane, Wash., has been appointed assistant general freight and passenger agent of the Spokane, Portland & Seattle Railway, in addition to his other duties. Mr. Paine is a native of Minnesota, but has been identified with interests in Spokane since 1889. After a period in the real estate business, and a subsequent connection with a mercantile company, he became one of the incorporators of the Coeur d'Alene & Spokane Railway. This company, with others, was later consolidated as the Spokane & Inland Empire Railroad, and Mr. Paine was made general freight and passenger agent. He was appointed vice-president and traffic manager in 1910, following a reorganization of the company. In his position with the Spokane, Portland & Seattle Railway he succeeds A. B. Jackson, formerly general agent for that road and the Chicago, Burlington & Quincy in Spokane, who remains freight agent for the latter road, while Mr. Paine will handle the passenger business.

Obituary

J. C. Woodsome, local manager of the Tampa (Fla.) Electric Company, died recently at his home in Tampa at the age of forty years. Mr. Woodsome was born in Boston, Mass. He was graduated from the Massachusetts Institute of Technology in 1901 and during the year following was an assistant instructor in that institution. For the next four years he was employed in the office of the Stone & Webster Management Association and was connected with that organization until his death. In 1906 he was appointed superintendent of the Houghton County Electric Light Company, Houghton, Mich., and the same year was transferred to the Dallas Electric Light & Power Company, Dallas, Tex., as general superintendent. Mr. Woodsome had been manager of the Tampa Electric Company since 1911.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Fiscal Agency Company, Jackson, Miss.**—Incorporated to purchase and control public utilities. Capital stock, $15,000. Incorporators: C. E. Moritz, W. A. S. Wheeler and W. D. Mounger, all of Natchez.

***Lehigh Valley Realty Company, Allentown, Pa.**—Chartered by officials of the Lehigh Valley Transit Company to take over and operate the various subsidiaries, consolidating under one head for more efficient control. The company will handle the realty interests of the company, with power to acquire lands for extensions and rights-of-way. H. R. Fehr, Allentown, president.

FRANCHISES

Hollywood, Cal.—The Pacific Electric Railway has asked the City Council for permission to substitute a single-track line on Franklin Avenue for the portion of the line which is now double-track.

Visalia, Cal.—The Visalia Electric Railroad has received permission from the Railroad Commission of California to construct its tracks at grade across three public highways in Tulare County.

Hartford, Conn.—The Connecticut Company has asked the Public Utilities Commission of Connecticut for its approval of the proposed method of reconstruction of its lines on Main Street between Church and Village Streets, Huyshope Avenue, Albany and Blue Hills Avenues and Windsor Avenue and the construction of a connecting curve on State and Market streets.

Lawrence, Kan.—The Kansas City, Kaw Valley & Western Railway has asked the City Council of Lawrence for a new franchise, the same in effect as that passed by the Council last summer and which the company failed to accept. The ordinance as proposed gives the company the right to operate its cars along the present routes and also to construct an extension east on Levee Street to New York Street.

Lawrence, Kan.—The City Council of Lawrence has passed an ordinance granting the Kansas City Railways permission to construct an extension from Eighteenth Street to Twenty-ninth Street.

***Kansas City, Mo.**—The Clinton Construction Company has asked the County Court for permission to construct an electric railway crossing any county road from the eastern end of Thirty-first Street to Leeds and thence to Blue Ridge Boulevard. Willard E. Winner, president.

Buffalo, N. Y.—The Public Service Commission for the Second District of New York has approved the construction of an extension by the International Railway on Elmwood Avenue from Hertel Avenue to the north city line.

Westerville, Ohio.—A franchise prepared by the Columbus Railway, Power & Light Company has been rejected by the Franklin County commissioners, who objected to the scale of fares proposed and the provision for the appointment of a commissioner to look after the county's interest for ten years and then give way to a company official after that time. The commissioners now propose to prepare a franchise which will provide for the creation of three zones with a fare of 5 cents each. Under this franchise the company will be required to pay a portion of the cost of any road or bridge improvement work.

Tacoma, Wash.—The Puget Sound Traction, Light & Power Company has received a fifty-year franchise from the Council to maintain a transmission line along certain public highways in Pierce County.

TRACK AND ROADWAY

Little Rock Railway & Electric Company, Little Rock, Ark.—A communication from the Little Rock Railway & Electric Company states that the proposed extension on Pike Avenue from Eighth to Eighteenth Street will be built by the Inter-City Terminal Railway and not by the Little Rock Railway & Electric Company, as stated in the ELECTRIC RAILWAY JOURNAL for May 19.

Visalia Electric Railroad, Exeter, Cal.—Plans drawn up by the surveying engineers of the Visalia Electric Railroad for the further extension of its lines through the Porterville district and south of Porterville have been approved and it is expected the actual construction of the line will be carried through without delay.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company has received permission from the Board of Public Works to construct an additional track in Martindale Avenue from the tracks of the Indianapolis Union Railway Company to Twenty-fifth Street, to facilitate the handling of troops to Fort Benjamin Harrison.

Kentucky Traction & Terminal Company, Lexington, Ky.—This company is reconstructing its track on Georgetown Street. The company has been required by the city to change its track for a distance of about ¾ mile from the south side to the middle of the street, and the plan is to build an entirely new track in the center of the street and not disturb the old track until it is completed and ready for use. Then the old track will be removed and cars routed over the new link.

***South Newcastle, Me.**—Burgess, Lang & Company, Boston, are promoting the construction of an electric railway from South Newcastle to Boothbay Harbor. The company has acquired a controlling interest in the Portland Power & Development Company at Damariscotta Mills. It is reported that the company may acquire the Wiscasset, Waterville & Farmington Railroad, a narrow-gage steam road.

Worcester (Mass.) Consolidated Street Railway.—This company proposes to construct an extension of its Hamilton Street line down through Lake Park.

Laurel Light & Railway Company, Laurel, Miss.—This company proposes to construct an extension to the Pettibone addition if the city will make certain changes in streets near the plant of the Texas Oil Company. The proposed line would be extended from the present Wausau line at the intersection of Central Avenue and Maple Street, east in Central Avenue to Pine Street, to Meridian Avenue and Joe Wheeler Avenue, ending at the northeastern city limit.

Trenton, Lakewood & Seacoast Railway, Trenton, N. J.—The right-of-way of the Trenton, Lakewood & Seacoast Railway in Lakewood township will be sold at a foreclosure sale to satisfy three judgments, two in the Supreme Court and one in the common pleas court. Two of the judgments were obtained against the Trenton, Lakewood & Seacoast Railway and one against the Vandergrift Engineering Company. Wilfred H. Jayne, Lakewood, and Frederick S. Wack, Point Pleasant, are the attorneys. [May 19, '17.]

Brooklyn (N. Y.) Rapid Transit Company.—Operation has been begun by the Brooklyn Rapid Transit Company between Crescent and Eleventh Streets on the extension of its elevated line from Cypress Hills to Clifford Avenue, Jamaica. At present it is a two-track line, but it will be enlarged when traffic conditions warrant. It is expected that the entire line to Clifford Avenue will be completed by the end of the year.

International Railway, Buffalo, N. Y.—A movement has been started in North Tonawanda to force the International Railway to elevate its new line through North Tonawanda and not permit it to operate at grade from Payne Avenue through Gratwick.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has awarded a contract to J. H. Burton, Jr., & Company, Inc., New York, at $54,913 for supplying order No. 4, consisting of untreated ties and timber for use on new rapid-transit railroads. The commission has declared forfeited the contract made with it by the Flick & Manuell Construction Company, New York, for the construction of the elevated portion of the Pelham Bay Park branch of the Lexington Avenue subway. This action was taken on May 23, upon which day Governor Whitman signed the Lockwood bill giving the commission the power to take over and complete with its own forces any rapid-transit construction contract which the contractor is unable for any reason to prosecute satisfactorily. A report has been made to the commission that all work had ceased on the Flick & Manuell contract and that the company was unable financially to carry the contract further. The commission, now being in possession of the work, has appointed Joseph H. Flick as manager for the city to push the work to completion.

New York State Railways, Syracuse, N. Y.—Work has been begun by the New York State Railways double-tracking its line on Euclid Avenue. The company is also replacing the brick pavement along its tracks in North Salina Street from Butternut to Catawba Street with groove-cut stone blocks. The two improvement jobs involve an expenditure of about $62,000.

Ohio Traction Company, Cincinnati, Ohio.—The city officials of Wyoming have asked the Ohio Traction Company to construct new track in Wyoming to cost about $60,000.

Port Colborne, Ont.—The Niagara District Hydro-radial Association has forwarded a resolution to the Provincial Government, asking that body to permit the construction of the proposed trolley line from Port Colborne to Bridgeburg and from Dunnville to Port Colborne immediately, instead of waiting until after the war.

Southern Pacific Company, Portland, Ore.—Announcement has been made by J. H. Dyer, assistant general manager of the Southern Pacific Company, that electrification of the company's line from Whiteson to Corvallis, 30 miles, will be completed between June 15 and July 1.

Southern Pennsylvania Traction Company, Chester, Pa.—This company plans to double-track its Chester-Darby line on Chester Pike.

Gettysburg (Pa.) Railway.—The rights-of-way of the Gettysburg Railway to Battlefield Park have been sold to the United States, appropriation for which was included in the Army bill recently passed. It is expected that the wire and rails of the company will be for sale shortly, and any inquiries along that line should be addressed to C. Taylor Leland, 414 Harrison Building, Philadelphia, Pa.

Hershey (Pa.) Transit Company.—This company reports that it is completing surveys for its proposed extension from Hershey to Manheim, but construction work on the line will not be begun for the present.

Columbia Railway, Gas & Electric Company, Columbia, S. C.—This company plans to construct an extension between 5 and 10 miles long to the prospective United States Army camp east of the city.

Chattanooga Railway & Light Company, Chattanooga, Tenn.—Work has been begun by this company on the construction of an extension from Rossville to Chickamauga Park. It is expected that the line will be in operation by June 15.

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—This company will construct a new station at West Chapman and Lemon Streets, Orange.

Chicago & Joliet Electric Railway, Joliet, Ill.—The directors of the Chicago & Joliet Electric Railway have authorized the erection of a new office building, at a cost of $35,000, to replace the structure destroyed by fire in January.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has awarded a contract for the construction of station finish for nine stations on the Eastern Parkway subway and the so-called Brighton Beach connection in Brooklyn to Snare & Triest Company, New York, at $464,540.

Piedmont & Northern Railway, Charlotte, N. C.—Fire recently destroyed the freight station of the Piedmont & Northern Railway at Greenville, S. C., causing a loss of about $4,000.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—It is reported that final details are being arranged by the Trenton & Mercer County Traction Corporation for the erection of its proposed new station at University Place and Dickinson Street, Princeton.

Valley Railways Company, Lemoyne, Pa.—Preliminary plans have been prepared by the Valley Railways for the construction of a terminal station at Walnut and River Streets, Harrisburg, in connection with the double-tracking of its line on Walnut Street, connecting with the Harrisburg Railways system. The proposed plans are being considered at a series of conferences with the City Council and City Planning Commission.

West Chester (Pa.) Street Railway.—Increased terminal facilities for West Philadelphia and a station almost twice the size of the present Sixty-ninth Street terminal are projected by the West Chester Street Railway and the Philadelphia Rapid Transit Company. A new station that will handle twice the number of people, eight tracks for the West Chester Street Railway in place of the five now in use, expansion and extension of the Philadelphia Rapid Transit terminus and moving the West Chester turnpike 60 ft. to the south are some of the improvements contemplated to handle the increasing growth of traffic at the point where Delaware County adjoins the city.

POWER HOUSES AND SUBSTATIONS

Union Traction Company of Indiana, Anderson, Ind.—A substation power plant has been moved from this company's power house at Anderson to Fort Benjamin Harrison, near Indianapolis. The station will be set on a siding and will handle power to be used in hauling the large crowds going to and from the fort.

Centerville Light & Traction Company, Centerville, Iowa.—This company has purchased a number of small central station companies in the vicinity of Centerville and expects to erect 13,200-volt transmission lines to connect these plants with its power station.

Tri-City Railway & Light Company, Davenport, Iowa.—Improvements involving an expenditure of about $400,000 to its local system are contemplated by the Tri-City Railway & Light Company. The work will include the installation of a 20,000-kw. turbine, rebuilding of electric transmission lines, installation of new equipment, etc. Energy will be transmitted from the power station at 13,200 volts instead of 4800 volts, as at present, when the improvements are completed.

Manhattan City & Interurban Railway, Manhattan, Kan.—This company is in the market for 200-kw. rotary converters.

McComb & Magnolia Light & Railway Company, McComb, Miss.—This company, which is constructing a line between Summit, McComb, Fernwood and Magnolia, will erect a power-plant at Fernwood. S. M. Jones, Laurel, president. [April 29, '16.]

Pittsburgh, Harmony, Butler & Newcastle Railway, Pittsburgh, Pa.—This company has awarded a contract to the Faber Engineering & Construction Company of Pittsburgh for the construction of a new storage dam and addition to its power plant at Harmony Junction.

Montreal (Que.) Tramways.—A contract has been placed by the Montreal Tramways with the Canadian General Electric Company for a 12,500-kw. steam turbo-generator, to be installed in the new power station at Hochelaga. The proposed improvements include a new substation, additional equipment and a conduit system linking up the various plants.

West Virginia Traction & Electric Company, Morgantown, W. Va.—Four Taylor stokers have been ordered by the West Virginia Traction & Electric Company for its power house at Morgantown to take care of the increased load. Two of these stokers will be installed under the new 500-hp. boilers now being erected and two will be installed under the present gas-fired boilers.

Wisconsin Electric Railway, Oshkosh, Wis.—It is reported that the Wisconsin Electric Railway contemplates the erection of a power plant.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent
Rolling Stock Purchases Market Quotations Business Announcements

Reducing the Selling Cost

Pointed Suggestions to Long-Winded Salesmen—Costs Increased by Uncertainty as to Who Really Buys

By W. McK. White
Holden & White, Inc., Chicago, Ill.

Much interest attaches to the discussions in the Manufacturers and Markets department of the ELECTRIC RAILWAY JOURNAL with reference to the possibilities of reducing the selling cost and thereby benefiting the purchasers. But it appears to me that the purchasing department of a railway is not totally responsible for the high selling costs and that to a marked degree both the executive and technical departments share the responsibility.

As Mr. Johnston intimates in his article published on page 899 of the May 12 issue, the law of averages prevails, but it is only through the reduction of one individual cost after another in the selling system that the general average will ultimately be reduced.

THESE FACTORS RAISE THE COST

There are a number of poignant causes that contribute to the high sales cost of electric railway commodities. Consider, for example, the cost induced by the long-winded salesmen, or the purchasing agent who permits a salesman to assume that the purchasing department has final decision on a definite deal, when the purchasing agent really should refer the salesman to another department head. Consider also the prevalence of curiosity testers and the inability of some mechanical or electrical departments to "sell" articles to their own executives. But perhaps of greatest importance is the case of executives who could easily reduce the time consumed by manufacturers' representatives in concluding negotiations for the equipment under consideration.

There have been many instances in which the railway men apparently do not realize the vast amout of time and money spent by manufacturers in studying railway conditions and in perfecting apparatus to reduce operating and maintenance costs. While, of course, the success of any particular device of this kind is profitable to the manufacturer, yet it is practically a "fifty-fifty" matter, because the success of a labor or material saving device, or of an article which reduces maintenance or operating costs, is of direct benefit to the railway. Therefore the close co-operation of the railway men and the supply manufacturers is one of the first means of reducing the railway cost of materials.

PEDDLERS AND SALESMEN

For this reason we believe that the term "peddler" is a misnomer and is not always used with a sense of approval on the part of railways. As a matter of fact, it is the so-called "peddler" who is frequently the man responsible for decreasing some railway expense, and if this is the case he should be given consideration. One can point to many electric railways where the high-class supply man is welcomed, or is made to feel welcome, and it is these roads which obtain the first benefits of new articles which reduce operating costs.

The long-winded salesman was mentioned. This is the man who will take up office hours "getting acquainted" and in talking on subjects entirely foreign to the immediate business, when it is apparent that the railway man has other things to do. We do not deprecate the idea of making friends wherever possible, but we do feel that when there are other salesmen waiting for interviews, or when a railway man has some problem under study, that is not the moment to consume either his time or ours. This cannot be emphasized too emphatically.

TIME WASTED COSTS MONEY

There are frequent cases on record where representatives of manufacturers have been invited to railway properties to negotiate on some specific proposition, but when they arrived they found that the man who made the appointment could not keep it. If the railway man invites a salesman to call, he certainly should notify that salesman of any change in his plans, even if this entails telegraphing. In one case a superintendent of motive power invited salesmen from three distant cities to meet him in a Central Western point on a certain day two weeks later. On that day the sales representatives were at the appointed place, but the railway man left word with one of his associates expressing his regret at not being able to see them as he had to leave town that morning.

A recent similar case is one where a master mechanic took a salesman to the general manager's office to decide finally on a sales proposition. The general manager said to the master mechanic: "Charlie, I am too tired to think of that to-night; come around to-morrow." The salesman had to stay over night. On the next day the general manager asked, "Is this device the one you want?" The master mechanic said, "Yes." Then the manager said: "All right; go ahead and put through a requisition." Now, this is another case where a day's extra expense was added to the sales costs. These are two actual examples, and practically every sales representative can cite similar cases. The lesson to be learned is an important one.

The last statement is partially connected with the former—that some technical men on railways either do not have the courage of their convictions or are unable to convince the executive departments of the possible saving or the possible increased efficiency to be gained by the use of some commodity. This is an every-day occurrence. It is realized that mechanical or electrical departments frequently want equipment expenditure for which the company finances do not justify; but there are also instances where equipment is vitally necessary, where the reduction in maintenance cost warrants the expense and where the company resources make its purchase entirely feasible, but where the department head is afraid of criticism if he places an order for the equipment.

CURIOSITY TESTING

Another habit which increases selling cost is that of curiosity testing. Practically every manufacturer is sending out equipment for inspection or trial installation, and a definite percentage of this goes to railway men who are accustomed to place such orders just to see what a device may be like and with full knowledge that they are under executive orders not to buy anything. At the same time it is known that there are salesmen so insistent on the forwarding of a piece of apparatus that the only way a department head can settle the matter is by having the apparatus come forward. In such instances, if the mechanical or electrical man knows that he cannot purchase, it would be far better to "decline with thanks" such an offer.

Finally (this suggestion is made in all seriousness), if the technical departments, as well as the purchasing and executive officials, would follow closely the advertisements in the electric railway trade journals and then would actually answer the advertisements, they could be more fully conversant with new apparatus at a less traveling and time cost to the manufacturer. Consequently they would co-operate to reduce selling price.

Signal Repair-Part Stocks

Value of Local Stocks Is Great—Steam Roads Ask Manufacturers to Suggest Lists—Author's Company Orders Reserve Parts with Manufacturing Requirements

BY F. K. DAVIS

General Manager Hoeschen Manufacturing Company, Omaha, Neb.

A railroad which either through necessity or wisdom decides to install automatic signals or highway-crossing bells, should realize that the failure of a certain part is very costly when all the facts are taken into account. If the necessary repair part must be ordered, a telegram usually is sent, and even if the manufacturer has the stock on hand, one or two days will elapse before the railroad can receive the much needed part. Also there may be considerable expense involved in making shipment by express.

In a number of places I believe the law requires that when a failure of crossing signal or bell is reported a watchman must be placed on that crossing until the signal is repaired, and if an automatic signal fails, orders must be issued for trainmen to disregard all indications of the signal. Likewise when the signal is again placed in service a new set of orders must be issued. Hence I believe it will be found that the money spent by the railroad in procuring emergency repair parts will more than equal the interest that would be paid if the parts had been purchased and carried in stock.

STEAM ROADS CO-OPERATE ON LISTS OF PARTS

Several years ago, when the General Railway Signal Company completed an installation of alternating-current automatic signals for the Grand Trunk Railroad in the State of Illinois, the railroad requested the manufacturer to make out a list of the parts which would be advisable to have on hand at the signal storehouse nearest the signal installation so that repairs could be made with the least delay possible. This list of material, after being checked by the railroad forces, was ordered and placed in stock. No manufacturer would attempt to crowd in too much on a list of this kind. His pride in his equipment and the prospect of securing future business would act as a sufficient check.

The Grand Trunk Railroad also contracted each year for all the mechanical interlocking appliances required, either for new contracts or for repairs during the term of the contract. It was usually specified that certain parts should be kept in stock by the manufacturer, and that these should be ready for prompt shipment. But during the course of the year, if orders for such a part did not equal the amount specified, arrangements were made to take over into the railroad's stores all or a part of the remainder. I know, however, that each signal supervisor endeavored to the best of his ability to keep on hand at some railroad storehouse in his territory a few of the parts which were most likely to be broken by derailment or other train accident so that repairs could be made without delay.

NO FIXED RULES TO FOLLOW

No set rule can be laid down by the manufacturer in regard to the matter of stock on hand for repair parts. The manufacturer must give his customer the best service possible, but it is also the manufacturer's privilege to invest his funds to the best advantage.

With certain exceptions we take care of our repair-part and new-equipment orders from the same stock. For instance, we will order enough of a certain part to equip 100 crossing bells and then add to this order enough more to enable us to meet all ordinary requirements for repairs.

Occasionally we receive orders calling for a relatively large number of a certain part, when our stock of that particular part is low. Such an order evidently is required for maintenance stock and no great harm can be done if the order is held for a time until we can fill it. It seems to me that this is the ideal way in which to handle the reserve supply stock. The railroad has to pay interest on the capital invested in keeping such a stock on hand, but the money and time saved by being able to make repairs promptly will go a long way toward offsetting the interest charge which attends having the parts ready for instant use.

37,000,000 Ties Treated in 1915

According to the latest figures compiled by the Government Forest Bureau, 37,085,585 crossties were treated during 1915. This is about 38 per cent of the total number of ties reported purchased during that year. Of the total number of ties treated in 1915, 25,831,204 were hewed ties and 11,254,381 were sawed ties.

There are many different causes of deterioration which necessitate the renewal of ties, the principal ones being decay, mechanical wear, breakage, insect attack, splitting, etc. In recent years the railroads have been prolonging the life of their ties by the use of preservatives, principally zinc chloride and creosote oils. Most of the crossties treated by the steam railroads in the United States are treated in closed cylinders permitting the application of a high pressure and designed to secure a heavy absorption of the preservative.

The schedules furnished to the steam and electric railroads did not request information as to the number of ties treated in 1915, but the Forest Service gathered statistics for this year from all of the treating plants in the United States. The table shows the number of ties treated by the preserving plants during 1915, by kinds of preservatives and kinds of wood.

NUMBER OF CROSSTIES TREATED BY PRESERVING PLANTS DURING 1915, BY KINDS OF PRESERVATIVES AND KINDS OF WOOD

Kind of Wood	Total	Zinc Chloride	Creosote	Zinc chloride and Creosote	Miscellaneous
All kinds	37,085,585	17,819,284	17,077,069	2,182,712	6,250
Oak	16,885,517	7,954,492	7,365,673	1,565,352	....
Southern pine	8,541,203	3,257,565	5,243,516	40,122	....
Douglas fir	3,553,854	2,760,952	787,247	....	5,655
Beech	2,933,737	100,000	2,469,202	364,535	....
Western pine*	2,007,609	1,702,167	301,581	3,861	....
Tamarack†	932,038	449,660	390,017	91,496	865
Gum	277,886	204,653	1,650	71,583	....
Birch	173,971	55	173,916	....	....
Elm	50,846	50,846	....	....	....
Maple	36,942	316	36,626	....	....
All other	1,691,982	1,338,578	307,641	45,763	....

*Includes lodgepole pine and Western yellow pine.
†Includes Western larch.

NEW YORK METAL MARKET PRICES

	May 3	May 31
Prime Lake, cents per lb	31	32½
Electrolytic, cents per lb	31	32½
Copper wire base, cents per lb	36	36
Lead, cents per lb	9⅞	11⅝
Nickel, cents per lb	50	50
Spelter, cents per lb	9½	9⅝
Tin, Straits, cents per lb	58½	67
Aluminum, 98 to 99 per cent, cents per lb	60	63

OLD METAL PRICES

	May 3	May 31
Heavy copper, cents per lb	24½	28
Light copper, cents per lb	21½	25½
Red brass, cents per lb	18½	19½
Yellow brass, cents per lb	17½	18
Lead, heavy, cents per lb	7¾	9½
Zinc, cents per lb	7	7
Steel car axles, Chicago, per net ton	$41.50	$42.50
Iron car wheels, Chicago, per gross ton	$24	$30.50
Steel rail (scrap), Chicago, per gross ton	$31.50	$34.50
Steel rail (relaying), Chicago, per gross ton	$39	$39
Machine shop turnings, Chicago, per net ton	$11.00	$14.50

CURRENT PRICES FOR MATERIALS

	May 3	May 31
Rubber-covered wire base, New York, cents per lb.	36½	36½
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable stranded, New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40	$40
Rails, heavy Bessemer, Pittsburgh, per gross ton.	$38	$38
Wire nails, Pittsburgh, per 100 lb.	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.85	$4.00
Steel bars, Pittsburgh, per 100 lb.	$4.00	$4.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$6.35	$6.85
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$7.55	$7.55
I-beams over 15 in., Pittsburgh, cents per lb.	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$4.15	$4.15
Cement (carload lots), New York, per bbl	$2.12	$2.12
Cement (carload lots), Chicago, per bbl	$2.16	$2.16
Cement (carload lots), Seattle, per bbl	$2.60	$2.50
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.21	$1.25
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.22	$1.26
White lead (100 lb. keg), New York, cents per lb.	10¾	11¾
Turpentine (bbl. lots), New York, cents per gal.	52	45

Copper Market Conditions

The copper market situation, as reviewed in *Copper Gossip*, published by the National Conduit & Cable Company, is improving. It says: "There has been substantial activity in the market for copper lately, with an upward trend to prices. The indication at present is that government purchases in future will be at approximately market prices. With this prospect in view the copper situation has become a more normal and legitimate affair. The trade is perfectly satisfied to let the law of supply and demand regulate the market value of copper. If, however, arbitrary action is exercised for the purpose of forcing prices either up or down the effect cannot but be disastrous. Such a method is certain to prove an unsettling factor to business stability. It is important that there should be an absolutely definite understanding regarding this matter, and a reassuring official statement to the effect that the selling price of copper, to all parties, will be governed by the established laws of trade. An artificially low price will create commercial unsettlement as well as a fictitiously high price. They are both destructive to prosperity.

"The copper situation is therefore one of intense interest and concern for the whole civilized world. The metal is needed in unprecedented quantities. It is also calculated to allay any apprehension regarding a possible shortage in supplies to specially note that mine and refining capacity were never so well equipped to meet demand as at present. New copper producing territory has been opened, smelter and refining facilities have been greatly enlarged, and the prospect is for a new record-breaking production. There is consequently not the shade of an excuse for boosting market prices to any previously unattained limit. Such a scheme would justly deserve to prove an ill-fated experiment."

Human Factor in Industry

The Western Efficiency Society held a national conference at Chicago, May 23 to 26, and presented an active program on the human factor in various phases of industrial preparedness. Addresses were made by C. E. Knoeppel, New York; Harrington Emerson, New York; W. A. Grieves, Columbus, Ohio; Magnus Alexander, West Lynn, Mass., and other authorities on industrial progress. At an evening session Charles R. Van Hise, president University of Wisconsin, presented an address on "Government Control of the Industries." One entire session of the convention was devoted to the discussion of labor problems, at which both employers and union labor representatives were heard. The permanent offices of the Western Efficiency Society are at 327 South La Salle Street, Chicago. This organization is composed of business managers, heads of departments, industrial engineers and experts, and others interested in the most effective means of production and distribution.

A Ton of Sapphires

The statement that a ton of sapphires will be used during 1917 by a manufacturer in the electric railway and central station field arouses interest because of the novelty and value of this material. Yet this is the quantity which will be required during 1917 by the Sangamo Electric Company for jewels for thrust and ring bearings in its electric meters. Sapphires for this purpose are purchased in the rough and must be put through a process of finishing and inspection which in thoroughness and accuracy compares with the methods followed in the watch-making industry.

The Sangamo company reports an increase of 50 per cent so far in 1917 as compared with the corresponding months in 1916 in orders for electric meters for central station purposes and "economy meters" for electric railway car energy-saving service. Nearly 1000 employees are now engaged exclusively in the manufacture of meters in a large new plant at Springfield, Ill. The materials required for meter manufacture are just those which have shown the greatest tendency to increase in price and scarcity during the last two years, but it is stated that a liberal purchasing policy, which anticipated the market, has provided an ample supply of practically all raw materials to meet the demand.

ROLLING STOCK

Manhattan City & Interurban Railway, Manhattan, Kan., is in the market for a number of second-hand double-truck motor cars and trailers, also several 200-kw. rotary converters.

Illinois Traction System, Peoria, Ill., will soon begin the construction of six large electric locomotives in its shops at Decatur, Ill. It is expected that the locomotives will be ready for service early in 1918.

United Railways & Electric Company, Baltimore, Md., noted in the May 12 issue as being in the market for eighty semi-convertible double-truck pay-as-you-enter cars, has placed this order with The J. G. Brill Company.

Salt Lake, Garfield & Western Railway, Salt Lake City, Utah, now being equipped with electricity, will purchase through H. A. Strauss, Harris Trust Building, Chicago, six motor cars and six trail cars, each 56 ft. long. The Salt Lake, Garfield & Western Railway is the successor to the Salt Lake & Los Angeles Railroad, 17 miles long. The road was recently bonded to provide funds to extend it for 3 miles and to equip it with electricity.

Springfield (Mass.) Street Railway, noted in the May issue as being in the market for cars, has specified the following details on one motor and two trailer dump cars which will have an 18-cu.-yd. capacity:

Number	1 motor, 2 trailer
Date of order	May 4, 1917
Date of delivery	July 20, 1917
Builder	Differential Car Co.
Type	3 compartment dump
Weight (total),	
Motor	52,200 lb.
Trailer	37,500 lb.
Bolster centers, length,	19 ft. 8 in.
Length over bumpers	39 ft. 0 in.
Width over all	8 ft. 2 in.
Body	Steel
Air brakes,	GE. straight and automatic
Axles	Forged steel
Control, type	K-35-G-2
Couplers	Tomlinson MCB.
Fenders or wheelguards	Pfingst
Gears and pinions,	Forged steel, heat treated
Headlights,	Crouse-Hinds "Melobeam"
Journal boxes	Symington
Lightning arresters,	Westinghouse
Motors	4 West. 306-CV, inside hung
Paint	Sherwin Williams No. 4861. Body, grey
Sanders	Murphy
Trolley catchers,	Wilson type "T"
Trolley base	U. S. No. 13
Trolley wheels,	Railway standard
Trucks	Wason arch-bar
Wheels	33 in. cast iron

Oklahoma Union Traction Company, Tulsa, Okla., noted in the April 21 issue as placing an order with the American Car Company, has specified the following details on these six cars which made up part of the order:

	Single-End One-Man Car	Single-End Passenger Smoking and Baggage Car
Number of cars ordered	3	3
Builder	American Car	American Car
Seating capacity	38	56
Bolster centers, length	———	32 ft. 6 in.
Length over bumpers	30 ft. 2 in.	56 ft. 2 in.
Length over vestibule	29 ft. 2 in.	54 ft. 2 in.
Width over all	8 ft. 0 in.	9 ft. 2 in.
Rail to trolley base	12 ft. 6 in.	13 ft. 2¾ in.
Body	Steel	Semi-steel
Interior trim	Statuary bronze	Bronze with mahogany enamel finish
Headlining	None, rafter finish	Agasote
Roof	Arch	Arch
Air brakes	Safety Car Devices Co.	
Axles	Brill	Brill
Bumpers	American Car—Channel iron	G-Co. anti-climber
Car trimmings	Brill	Brill and Dayton Mfg. Co.
Control type	GE. K-10	GE. type PC.
Couplers	None, pull bars used	Tomlinson MCB radial
Curtain fixtures	Curtain Supply	Curtain Supply
Curtain material	Pantasote	Pantasote
Designation signs	Hunter	
Door operating mechanism,	Safety Car Devices—air-operated	
Wheelguards	HB. Life Guards	American Car—steel pilots
Gears and pinions	GE.	GE.
Hand brakes	American Car Co.'s with Pittsburgh ratchet drop brake handles	American Car with Pittsburgh ratchet drop handle
Heaters	Consolidated Car Heating	Peter Smith hot air
Headlights	Golden Glow	Golden Glow T-128
Journal boxes	Brill	Brill
Lightning arresters	GE.	GE.
Motors, type and number,	Two GE. 258-A inside hung	Four GE. No. 201 inside hung
Paint, varnish or enamel	———	American Car
Sanders	Keystone air sanders	Ohio Brass air sanders
Sash fixtures	O. M. Edwards	O. M. Edwards
Seats, style	American Car Co.'s light weight reversible	Brill stationary upholstered in green leather
Seating material	Mahogany wood, steel and canvas lined rattan	
Springs	Brill	Brill
Step treads	Feralun	Feralun
Trolley catchers	Keystone	Retrievers Knutson
Trolley base	GE.	GE.
Trolley wheels or shoes	GE.	GE.
Trucks, type	Brill 21E	Brill 27 MCB-2
Ventilators	Brill exhaust	Utility Ventilator
Wheels (type and size)	33 in.	37 in. Davis cast steel
Special devices	Faraday high voltage push button system	O. M. Edwards steel trap doors

TRADE NOTES

Robert W. Hunt & Company, engineers, Chicago, have offered to the government the services of their entire organization without profit.

Ohio Brass Company, Mansfield, Ohio, has received an order from the Transit Development Company for 3000 straight-line hangers.

Monitor Controller Company, Baltimore, Md., announces that E. Wesley Vaughn has joined the sales organization of its New York offices, of which Joseph Frese is manager.

Western Electric Company, Chicago, Ill., announces that its Seattle (Wash.) branch has moved from 907 First Avenue to 84 Marion Street, where it will occupy a two-story brick building erected especially for the company.

Henry J. Jumonville, certified public accountant, who was formerly general auditor of the American Cities Company and of its subsidiaries, announces the opening of offices for the practice of public accounting in New Orleans, La.

Asbestos Protected Metal Company, Pittsburgh, Pa., announces the appointment of Stanley L. Rau as sub-agent for Grand Rapids and vicinity, working in connection with the Detroit office. Mr. Rau is located in the Powers Theatre Building.

Morgan Crucible Company, New York, N. Y., has moved from 114 Liberty Street to 519 West Thirty-eighth Street. The company's factory is being moved from Brooklyn to New York so that it will not only have larger quarters but also gain the advantage of having factory and office under one roof.

Dunbar Manufacturing Company, Chicago, Ill., is the new name of the company formerly known as the Acme Supply Company. Thomas Dunbar is president, H. U. Morton, vice-president and treasurer, and T. K. Dunbar, secretary. The general offices of the company are at 5133 West Lake Street, Chicago.

Ellsworth L. Mills, formerly head of the track division of the Public Service Commission, First District, has resigned from the firm of Gibbs & Hill, consulting engineers for the commission, and hereafter will be associated with Dilsworth, Lockwood & Company, New York City, in the management of its railway supply department.

Charles A. Schieren Company, New York, N. Y., manufacturer of leather belting, has recently opened branch offices at 72 Congress Street, West, Detroit; 18 South Broadway, St. Louis; 475 South Main Street, Memphis; 272 Marietta Street, Atlanta, in addition to those already established at New Orleans, Dallas, Boston, Philadelphia, Pittsburgh, Chicago, Denver and Seattle.

C. S. Butler has resigned from the Hess-Bright Manufacturing Company, Philadelphia, Pa., after having been associated with it for about seven years, to become sales manager of the Carlson-Wenstrom Company, Richmond Street and Erie Avenue, Philadelphia, a subsidiary of the Carwen Steel Tool Company. Mr. Butler's resignation from the Hess-Bright Company became effective on May 31. The Carlson-Wenstrom Company has a well-equipped plant for making bearings, and intends to manufacture and introduce a new design of high-grade double-row ball bearing and to market a complete line of thrust ball bearings.

Holden & White, Inc., Chicago, Ill., general sales distributers of Hartman centering center plates and Perry anti-friction side bearings, report orders received recently for these bearings from the following railways: Waterloo, Cedar Falls & Northern Railway; Chambersburg, Greencastle & Waynesboro Railway; Philadelphia Rapid Transit Company; Mahoning & Shenango Railway & Light Company; Baldwin Locomotive Company for new cars of the Northern Ohio Traction & Light Company; Denver Tramway Company; Oklahoma Railway; Salt Lake & Utah Railroad; Albany-Southern Railroad; Cedar Rapids & Marion City Railway, and the Oakland, Antioch & Eastern Railway.

Hess-Bright Manufacturing Company, Philadelphia, Pa., announces that it is now and has for some time been booking orders in large quantities for ball bearings which are specified in government contracts with large manufacturers of motor trucks and aeroplanes. Many orders for thrust bearings of the larger sizes specified for use in the building of submarine chasers have also been received. Other contracts, in addition to the annular bearings for battle and training planes, have called for the company's Monarch bearing, which is built under the Conrad patents, recently adjudicated. This bearing will be supplied in quantities for mounting in the hubs, transmissions and steering knuckles of modern high-powered trucks.

Union Switch & Signal Company, Swissvale, Pa., reports a number of recent orders among electric railway companies. Among them is one from the Boston Elevated Railway for material for its Dorchester subway extension. The apparatus will include double impedance bond layouts, track transformers, automatic train stops, Style "L" three-lens light signals and Model 15 vane-type two-position track relays. Another large order is from the Interborough Rapid Transit Company for its Seventh Avenue subway from West Forty-third Street to Wall Street and for the West Farms subway connection and the Pelham Bay Parkway line. This order includes for the Seventh Avenue line two nineteen-lever, two fifteen-lever, two seven-lever and one twenty-three-lever electric-pneumatic interlocking machines, with the attendant automatic stops, alternating current relays, switches, etc. A third recent order is from the United Railway & Electric Company of Baltimore and is to provide signal protection for a drawbridge over Boar Creek in connection with the automatic block installation. A three-lever dwarf machine will be placed at the center of the drawbridge to operate the train stops and the circuit controller for the control of the 600-volt current operating the bridge. Automatic stops will be placed on each track and these will be operated through pipe lines by the dwarf machine on the draw. Home and distant signals of the Model "M" light type will be installed to provide indication. Stick locking operated by a clockwork time release will be installed to insure that the signals indicate stop and that the tripper arms are in the engaging position before the draw can be moved.

ADVERTISING LITERATURE

Association of Manufacturers of Chilled Car Wheels, Chicago, Ill.: Paper on "Chilled Iron Car Wheel" presented before Canadian Railway Club of Montreal, Que., Feb. 13, 1917, by George W. Lyndon.

Remington Typewriter Company, New York, N. Y.: A bulletin on railroad payroll and pay check writing which describes a railroad accounting machine for writing payrolls and pay checks at one writing.

Peter Witt: A bulletin, "The Car Rider's Car." Shows photographs and diagrammatic arrangement of the operation of loading and unloading. The adaptability of this car to a number of cities is discussed and the bulletin contains the opinions of prominent railway men.

American Steel & Wire Company, Chicago, Ill.: Bulletin on preparedness for winter's food supply by Dr. Ernest W. D. Laufer, agronomist. Bulletin is published in hope of making each community as nearly self-supporting as possible in production of food for home consumption.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Leaflet 3977 descriptive of electrical speed indicators for use in power stations, industrial plants and similar applications. Also, leaflet 3324 on potentiometers for the measurement of "hot spots" in electrical apparatus.

Lincoln Electric Company, Cleveland, Ohio: Catalog No. 104 on electric arc welding. Comparisons of costs of arc welding with other systems are given. One section devoted to electric railroad shops has numerous illustrations and descriptions of applications of arc welding that have proved successful.

Underwriters' Laboratories, Chicago, Ill.: A bulletin to its staff signed by W. H. Merrill, president, notifying them of definite plans which have been made by the government for utilizing the company's service of inspection at factories turning out munitions. One recent order by the government is for 1,000,000 ft. of No. 14 Duplex leaded wire for immediate delivery, goods subject to the company's inspection and labeling.

Electric Railway Journal

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VALUABLE BY-PRODUCT OF THE WAR Out of the turmoil and stress of this war is going to come a new solidarity in the country as a whole, and especially in the industrial and public service corporations upon which rests the prosperity of us all. Already we see indications that a seriousness and a sense of responsibility are beginning to pervade the personnel of the electric railways, in common with other groups of men organized for specific service. The result must be that internal problems can be more readily solved because employer and employee shall have been brought to realize their essential equality when matters of honor and courage are in question. There has been a great deal of unnecessary friction between capital and labor in electric railway companies during the past few years, but we sincerely hope to see, after the war has closed, that a better day for men and manager has dawned. These remarks are prompted by the accounts of patriotic mass meetings, flag-raising exercises and other group events held by electric railway companies during the past few weeks. One such meeting, at Hampton, Va., is described in this issue. The incident suggests that employees of all ranks will miss a great opportunity if they do not become better friends under the centripetal forces of this world's cataclysm.

RELIEF NEEDED FOR UP-STATE ROADS The general facts found by Professor Conway of the University of Pennsylvania in his analysis on page 1045 of the financial conditions of the up-State New York electric railway companies will hold true, we believe, with most electric railway properties in this country. Labor and material charges, as well as taxes, have greatly increased during the last five years, and owing to these conditions companies have been forced to provide for the added facilities required by the increased traffic during this period by bond issues rather than by increases in their capital stocks. The result has been, for all of the companies in New York outside of New York City during the last five years, an increase in railway operating revenues of 15 per cent and an increase in interest charges, rentals and "other deductions" during the same time of 51 per cent. These changes were accompanied by a reduction in net income available for dividends of 78 per cent and of net income to gross income of from 41.1 to 9.1 per cent, so that there was a reduction in the percentage of net income to capital stock of from 3.44 per cent in 1911 to only 0.77 per cent in 1915. The worst part of this situation is that the conditions which brought it about are not improving; in fact, they are getting worse. We believe that if the facts are placed before the public there will be a general acquiescence in the only real relief possible, namely, higher fares. This, we hope, will be the result of the present New York State campaign.

ECONOMY IN FUEL AND MAN POWER A NATIONAL DUTY A significant development of the past week is the announcement by a number of steam railroads of curtailment of their services by the consolidation of some passenger trains, the elimination of others with small patronage and a reduction in the number of chair, dining and observation cars to be operated. These changes are not made to increase net revenues but to conserve the fuel supply and increase the capacity of the roads for coal, food, government material and troops, and they are being carried out to conform with the recommendations of the Railroad War Board at Washington, D. C. The general situation on the steam roads, so far as the desirability of conserving the available supplies of fuel and man power is concerned, is of course the same on the electric roads and suggests similar steps on their part. While there will be no great increase in the amount of freight to be carried or government transportation to be undertaken on the electric roads, the experience of the British tramways indicates that the passenger traffic on our electric roads will be greatly increased during the war, partly as a result of the intensive industrial conditions and partly because of the reduction in steam railroad passenger service. This condition emphasizes the necessity of introducing as a war measure all methods in electric railway operation which will economize fuel and labor and will increase track capacity where that capacity is needed. There are many such methods available, and we are confident that the public will support the companies in introducing these measures as a matter of national defense, if the need for them is fully explained.

STEEL WIRE TO THE RESCUE When a great system like the Pacific Electric Railway finds that it can dispense with copper trolley wire and so make renewals at 12 cents a pound instead of 40 cents, other roads throughout the land will be eager to learn how the feat was accomplished. We believe that they can get all of the important facts from Mr. Anderson's article, published in this issue, telling of his successful installation of 100 miles of steel trolley wire, beginning as early as 1910. It is evident from earliness of this date that the introduction of steel was not a war measure, since copper was then selling around 15 cents a pound. The company put up the first steel wire simply in the hope that its lower first cost and presumably longer life would more than offset its lower conductivity. This hope has been amply justified by time, for the steel on the first lines promises three to four times the life of copper except at accelerating points. While climatic conditions on the inland lines of the Pacific Electric are unusually favorable, salt air has had no terrors for galvanized steel. Certainly the service is severe enough. The Pasadena and Venice Short Lines are really suburban rapid transit rather than interurban lines; while the San Bernardino line is the company's speediest interurban. Mr. Anderson ascribes much of the success of the galvanized steel trolley wire to so simple a cause as the maintenance of uniform tension in the current collecting equipment. The availability of oxy-acetylene for welding splices is another factor. In spite of earlier discouraging trials of steel wire in the East, the success of the Pacific Electric Railway and the prohibitive price of copper will prove strong incentives to try again with better wire and better methods. The recent purchase of 50,000 lb. of steel wire by the Los Angeles Railway is the significant indorsement of a neighbor.

FUNCTIONS OF THE ASSOCIATION MANAGER

There seems to be a growing tendency to apply modern business principles to the management of local electric railway as well as other associations. The California Electric Railway Association and the Southwestern Electrical & Gas Association are good examples of this practice. The report of the California association appeared in our issue of two weeks ago. For this reason we shall speak more particularly of what it has done, although the same general principles apply to the Southwestern association as well.

Perhaps members of other associations who read this report marveled how so much could be done in so short a time and in a state practically as big as New England, New York and Pennsylvania combined. The secret lies in the method of organization for work. Instead of assigning to each task a group of active operating men, who often prove inactive as committeemen, the California association picked out an experienced railroad man who serves with the title of manager and receives instructions from and reports to the executive committee. Thus, when the association wanted jitney statistics, it did not rely upon haphazard voluntary co-operation, but rather upon having its manager make the gathering and co-ordinating of such data his chief business. If an injurious measure is before the Legislature, the individual members of the association do not work at cross purposes, but leave to the manager the duty of placing before the legislators, frankly and openly, the reasons why the measure should not pass.

Again, if one of the member companies needs help in waging some local campaign the manager may be available for several weeks' service. In sum, the California way is to leave as little as possible to the volunteer system of meetings with its frequent postponements, large percentage of absentees and high expense for traveling and time. The work is centered in a professional, so to speak, who is familiar with all sources of data, who is untrammeled by the nightmare of local conditions, and who for the time being has no other object in life than to see that the California electric railways get their honest due.

For the same reasons that the city manager plan conduces to effectiveness in municipal affairs, the association manager plan should be effective in its field, but it requires extraordinary foresight in selecting the manager.

BECOMING BETTER ACQUAINTED WITH THE POWER PLANT

In connection with its campaign for economy in the generation and use of energy the ELECTRIC RAILWAY JOURNAL had occasion, a couple of weeks ago, to recommend that platform men and others be introduced to the power plant as far as possible. In making this recommendation it was realized that to carry out the fundamental idea underlying this suggestion something more than a mere hurried inspection trip through the plant is necessary. A modern power plant is such a complicated energy-generating machine that the lay visitor is apt to obtain but a confused, superficial and transient notion of what it is all about.

The task of giving the visitor a comprehensive idea of what a power plant is doing is simplified if his attention is directed to the routes of the several materials which pass through the plant in the course of its operation, making this term broad enough to include electricity, fuel, air and water. Such a plan has been followed in the article on the new Essex power plant of the Public Service Electric Company appearing elsewhere in this issue. This procedure not only enables one to grasp the relation of the different pieces of apparatus in the plant but also assists in visualizing the energy transformations, losses and possible savings. Take, for example, the circulating water for the condensers. It is obvious that this water must be screened to remove debris, it must be pumped through the condensers, the condensers must be arranged so it will come into intimate contact with the tubes containing the steam, and it must be discharged where it will not heat the incoming water. It is also apparent that all of the heat taken away from the plant in the circulating water is a clear loss, although, sad to relate, it is a necessary loss. Take, for another example, the air used in the combustion of the fuel. In the Essex plant a part of the air is first washed, cooled and moistened before it is drawn through the electric generators. Here it takes up most of the heat wasted in the generators, and then, supplemented with the necessary additional volume, is forced into the boiler furnaces. Here the greater part of it combines with the constituents of the fuel, producing intense heat, most of which is absorbed by the water in the boiler and superheated tubes. From the furnace the resulting assorted gases pass through the economizers, giving up a part of their heat to the feed water, and aided in their rush for the stacks, if necessary, by the induced-draft fans. As they leave the stacks the gases take away another considerable fraction of the energy originally available in the coal, a source of waste which, like that in the circulating water, will always be with us.

THE 6-CENT FARE A NATIONAL ISSUE

It becomes more apparent every day that if the 6-cent fare campaign is to be a success, it must receive the participation of electric railway companies generally throughout the United States. It is inconceivable that the 6-cent fare should be charged in a third or a half of the cities of the country and a 5-cent fare in the others. It is true that there are now 3-cent fares in some cities, but they were granted under such exceptional conditions as hardly to create a precedent in other places. If now, however, the 6-cent fare should be granted, there would be tremendous pressure to bring it down again, unless a similar rise should be achieved generally throughout the United States.

There will be a political campaign next fall. It will be more municipal in character than state or national. The development of this electric railway fare question will give every city demagog in the country a chance to become violent in his denunciation of street railway companies and a chance to create fictitious issues. That situation must be met very candidly and frankly. It becomes all the more necessary that the public itself should be made to understand that an increase in fares is in the public interest. Only by doing so will the public stand for the increase which is asked.

Even if commissions grant some of the requests for increased fares, the fight is apt to be passed on to the various state legislatures. We doubt not that if requests for increases should be acceded to, many state legislatures would try to take away the power of commissions to grant just such increases. It will be remembered that in spite of the fact that many commissions had the power to say what the charges for passenger fares should be, many state legislatures have passed laws restricting steam railroad passenger fares to 2 cents a mile. That is a danger which undoubtedly confronts the street railway business and must be borne in mind in all that is said and done.

This question cannot be settled with reference to the needs of any one company. In many cities there are several companies, and the financial condition of these different companies varies. An increase in fares may be profitable to one of these companies and yet in another case barely make it possible for the company to live. Yet it is inconceivable that increases should be granted on certain lines in a city and not on other lines in the same locality.

The settlement of this issue is going to require the highest statesmanship of the public service commissions of the various states. Great courage will be required on their part to deal with it. There will be widespread popular clamor, though we predict that that clamor will slowly but surely subside in vociferousness. The fact cannot be escaped that 6 cents' worth of service cannot be given indefinitely for 5 cents.

As we see it, there are two fundamental facts in the situation which must be laid before the public candidly and persistently. The first is that the street railway of to-day is a very different kind of road from that on which the 5-cent fare basis was originally established, and that an increased fare is warranted in the public interest if the companies are to be permitted to keep up with the progress of the railway art. The second is that the cost of doing all business is now very much increased over what it was even a few years ago and that this new basis of costs promises to be fairly permanent. At any rate, the public, through its commissions and through the exercise of an enlightened public opinion, always has the opportunity to cut down the fares granted, should it be found that increased rates provide excessive profits.

It seems to us that the companies should bring continuously to the attention of their individual constituencies that the real point of importance is that the companies must be enabled to give a constantly improved service. Unless the public shows a disposition to be willing to pay for that improved service every inducement to provide it is automatically withdrawn.

The public need have no fear of its inability to protect itself from taxation through any unusual profits which might be derived from a slight increase in the individual fares.

The electric railway business is undoubtedly at the parting of the ways. The campaign may be long; it will certainly be arduous, for the opposition will be bitter in appearance even if not in fundamental fact. But the operation of the economic laws which now compel the actual payment from somewhere of the increased cost of the improved service now being given to the people of the United States can no more be circumvented than can be the operation of the laws of gravitation.

But the vital necessity is that every electric railway in the country be alive to the situation and take immediate steps to bring the condition to the attention of its local authorities. It is not a local issue; it is a national issue, for it involves the welfare of every community in the United States which is being served by electric railways.

PUBLIC SERVICE COMMISSIONS exist not only for the protection of the traveling public, but also for the protection of the investor in public utilities. The duty of the commission both to the rider and to the investor clearly points to the need for specific action without delay.—PROFESSOR CONWAY *on the need for higher carfares in New York State. (See page* 1045 *of this issue.)*

Successful Use of Steel Trolley Wire by Pacific Electric Railway

The Present High Price of Copper, the Electric Railway's Staff of Life, Makes This Account of Timely Interest—About 100 Miles of Steel Wire Have Been Put Up by This Railway Since 1910 for Both Inland and Coastwise Lines of 600 or 1200 Volts and Direct or Catenary Suspension

By S. H. ANDERSON
Electrical Superintendent Pacific Electric Railway, Los Angeles, Cal.

WHEN the Pacific Electric Railway put up its first steel trolley wire on Feb. 20, 1910, we had no thought that five to six years later the price of copper would soar to such heights as 40 cents a pound. We simply felt that even with copper at 15 cents, it was worth while for us to experiment with steel as a substitute. As we have been told that our experiment has proved more successful than most others, we shall try to tell all that we have done and learned in this work, assuming that our fellow railway officials are anxious to try some 12-cents-a-pound steel in preference to 40-cents-a-pound copper.

To begin with, the Pacific Electric Railway has now in service of widely divergent character about 100 miles of No. 0000 double-grooved Roebling steel wire.

WIRE PUT UP SEVEN YEARS AGO STILL IN USE

The first steel wire was put up on the south-bound local track of the Pasadena Short Line between Oneonta Junction and Sierra Vista, a distance of some 4500 ft. on a slight down grade. This was 600-volt direct suspension. This first wire was not galvanized, and it was butt-welded in the factory. Later, wire was ordered galvanized, the idea being that if the upper part of the wire was kept from being pitted by corrosion, moisture would have no damaging effect on the wire.

Considerable trouble was first experienced on account of the wire parting at the factory splices and a lap weld braze of 70 per cent section was made at the factory in place of the former butt weld. This eliminated considerable but not all of the trouble and it was necessary to devise a satisfactory means of welding the wire on the job when breaks occurred. The method is described later.

Seven years' service is a pretty fair test period on a line with three to four-minute train service during rush hours. The presence of two long curves on the pioneer section gave opportunity also to study side wear.

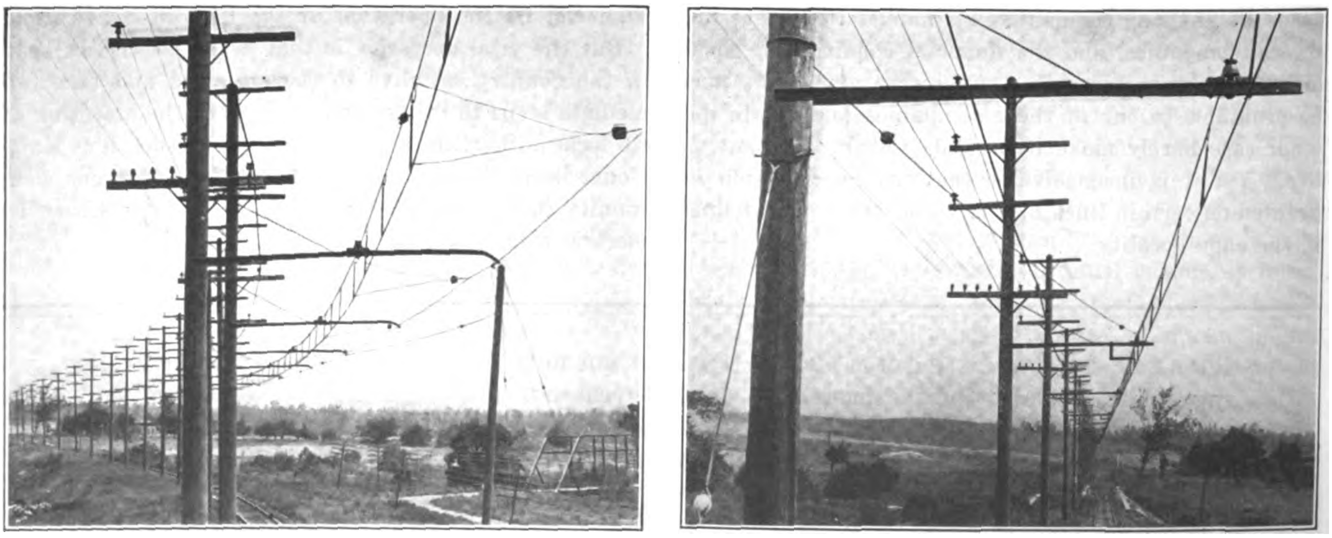
A recent inspection showed this wire to be in first-class condition on the whole. It had a smooth, polished surface on the underside, but no signs of wear were apparent at the clips, switch points or splices, contrary to the condition with copper trolley wire. Since the copper and splice at both ends of the steel wire had been renewed twice since 1910, and as the steel is good for at least four or five years more, the life of steel on tangents should be three to four times that of copper. However, at accelerating or feeding-up points we do not expect steel to last longer than copper, if as long. At this writing more than 60 per cent of the Pasadena Short Line, or 20 miles, is wired in steel.

EXTENSION TO 600-VOLT CATENARY SERVICE

On May 17, 1912, we installed 4800 ft. of steel trolley wire on the inbound track of the Venice Short Line running west from Hauser. This is a high-speed catenary interurban line with three to four-car train service, and runs to the seashore. The section considered has an average grade of 0.2 per cent and contains quite a pronounced curve.

Inspection made a few months ago shows the following: On the tangents, where the service is the fastest, the original vertical diameter of the wire has been worn about 13 per cent; at the clips of the hangers, 22 per cent. The estimated future life on the tangent is three years. On the curve, the diameter has been reduced 22 per cent in the run and 29 per cent at the clips, and the estimated future life here is two years.

For about 500 ft. of the tangent beginning where the curve ends, as shown in the accompanying plan, the wire

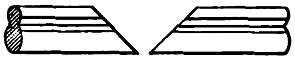


VIEWS ON SAN BERNARDINO LINE OF PACIFIC ELECTRIC RAILWAY SHOWING OVERHEAD CONSTRUCTION WITH STEEL CONTACT WIRE was worn to approximately 58 per cent of its original diameter. This 500 ft. was renewed in March of this year. This rapid wear has confirmed our conclusion that, because of the heavy arcing at accelerating points, the wear of steel is as great as or greater than copper.

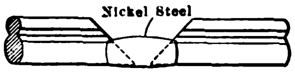
LATER INSTALLATIONS ON 1200-VOLT LINES

As galvanized steel trolley wire was giving us satisfaction right along, we kept on installing it until we have now approached the 100-mile mark. Perhaps, the most important installations are on our famous "Orange Empire" lines, the San Bernardino-Riverside line, 10 miles long, and Riverside-Corona line, 14 miles long. On these routes, long trains are operated at speeds of 60 to 70 m.p.h. The smaller current taken on this 1200-volt line produces less burning than on the 600-volt lines.

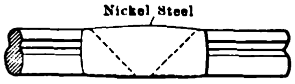
So far as we are able to determine, trolley wheels do not wear out any faster under steel than under copper. However, we believe that the chief reason for our success is that 75 per cent or more of the cars under this wire are equipped with pneumatic trolley bases which keep the tension absolutely constant to our standard of 35 lb.



Showing Two Ends Prepared for Welding



Weld Half Completed



Finished Weld

THREE STAGES IN WELDING STEEL CONTACT WIRE

Of course, the lower conductivity of steel makes necessary a larger number of feed-in points. On the San Bernardino line where we have 600,000 circ. mil of copper and the steel messenger in parallel with the trolley, the feed-ins are 450 ft. apart. Each tap consists of thirty-seven strands of No. 12 copper clamped to the messenger, carried down to the trolley wire and secured thereto with four-screw bronze ears. We figured that on this line with any one substation out of service the maximum drop with copper would be to 500 volts and with steel to 422 volts. For direct suspension, we are gradually installing a tap at every other pole, that is, about 220 ft. apart.

Generally speaking, the maintenance on steel trolley is far below that of copper, since steel is much harder. The clips hold much better in the grooves, and the wire does not break if the trolley pole hits a span. We have not had a single break due to crystallization at the ends of ears, splices or switches. In most cases, steel wire that has been accidentally broken and "shorted" on the rail can usually be restrung, whereas copper wire would become annealed.

The linemen state that steel is easier to pull up and that it can be handled for double the length of copper without sagging. Steel wire does not cut out on the sides when out of alignment nor does it pound flat at clips as does copper. Practically all the wear is due to burning and arcing at acceleration points.

OXY-ACETYLENE METHOD OF WELDING STEEL WIRE

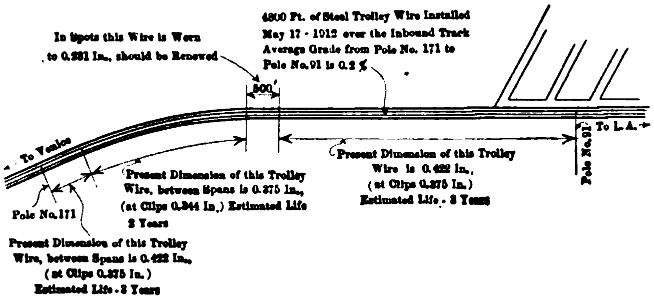
As the correct welding of splices in steel trolley wire is so important, the method developed on this system is worth description in some detail. The successive steps in making a weld are shown in the drawing above.

The equipment consists of a Prest-O-Lite outfit of gages, welding torch and tips. The torch is style H, and the size of the tip No. 5, this size being most satisfactory for our No. 0000 double-grooved wire. We first tried welding rods of Norway iron, but this led to crystallization. Our welding rods are now of 1/4-in. or 3/16-in. diameter nickel steel, which is also furnished by the Prest-O-Lite Company.

The three-part sketch shows the different stages of a weld. First the opposing ends of the wires to be joined are cut at an angle of 45 deg. and a space of 1/8 in. is left between them to provide for expansion. The flame of the torch, which is next applied, easily disposes of the galvanized scale which coats the wire.

As soon as both ends of the wire are at the melting point, the welding rod is introduced, great care being taken to keep both ends at about the same temperature. As the nickel steel is melted from the rod, it is fluxed with the steel trolley wire by means of the flame, starting at the bottom and building across and up. We found that we obtained a better application by running the welding steel around on the sides of the trolley wire; we also extended the natural top line of the wire for the sake of reinforcement but we do not regard this as essential.

As soon as all necessary metal has been added, the weld while still red hot is filed down to a smooth underrun and shaped up as much as desired. Then cold water is poured on the wire, beginning about 1 ft. on each side of the weld and running the heat toward the weld. Finally the weld is reached and wetted until perfectly cold. The average length of time to weld the wire in the air varies from ten to fifteen minutes, according to accessibility.


In Spots this Wire is Worn
to 0.281 In., should be Renewed
4800 Ft. of Steel Trolley Wire Installed
May 17 - 1912 over the Inbound Track
Average Grade from Pole No. 171 to
Pole No. 91 is 0.2 %
500'
To Venice
To L. A.
Pole No. 91
Present Dimension of this Trolley
Wire is 0.422 In.,
(at Clips 0.375 In.)
Estimated Life - 3 Years
Present Dimension of this Trolley
Wire, between Spans is 0.375 In.,
(at Clips 0.344 In.) Estimated Life
2 Years
Pole No. 171
Present Dimension of this Trolley
Wire, between Spans is 0.422 In.,
(at Clips 0.375 In.)
Estimated Life - 3 Years

RESULTS OF RECENT INSPECTION OF STEEL CONTACT WIRE ON VENICE SHORT LINE, PACIFIC ELECTRIC RAILWAY

BENDING, HEAT AND RESISTANCE TESTS

In conclusion, it may be of interest to mention some bending, heat and resistance tests which we made on June 24, 1912, shortly after receipt of the galvanized wire. The bending test showed that the wire could stand six right-angle bends in a vise before breaking on the seventh bend.

To find how much heat could be withstood and how much current could be carried, alternating current was passed through the wire until it was red hot. After cooling, the wire was found to be more flexible but still tough enough for use as trolley wire. It was given ten right-angle bends without breaking. Upon this direct current, averaging 750 amp., was passed through the wire for five minutes. At the end of this time it was heated to a cherry red and the galvanizing had burned off, but the wire was otherwise uninjured. This latter test proved that under normal service conditions the wire would not be damaged by high temperature. However, even if the galvanized coating was burned off by some heavy ground, this would not be so bad as the annealing of grounded copper. We calculated that the current-carrying capacity of this wire was just within the limits of the demand of our heaviest freight trains.

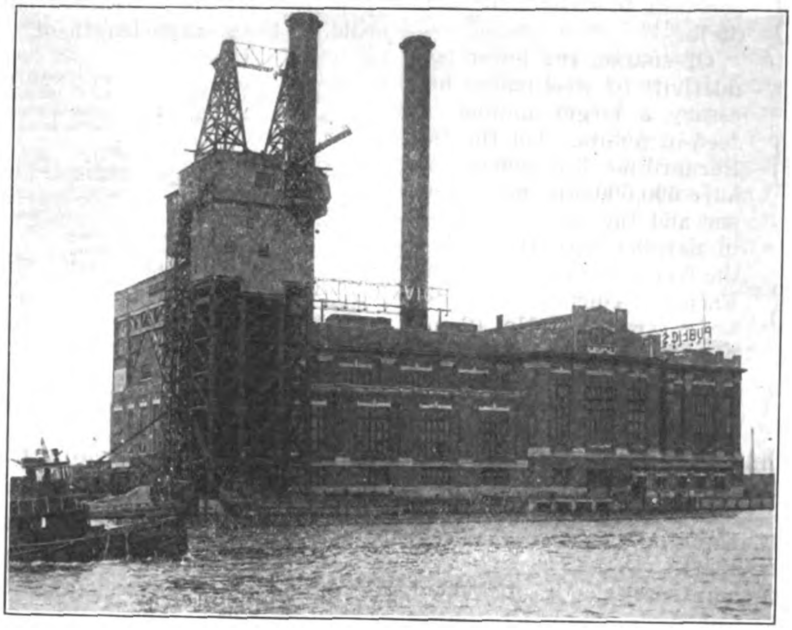
Our third test was to determine the resistance of the wire. Volt-ampere readings showed the resistance to be 0.000342 ohm per foot at 100 deg. Fahr., or 6.53 times the resistance of No. 0000 copper at 100 deg. Fahr. As the steel is 10.6 per cent lighter than copper, its resistance per unit of weight is 5.83 times that of copper.

Main Entrance to Essex Station

New Source of Power for Public Service Railway

The Essex Power Plant of the Public Service Electric Company Furnishes an Excellent Example of the Latest Steam Power Plant Practice—In This Article the Routes of Fuel, Water, Air and Electricity Through the Plant Are Traced

THE Public Service Railway and the Public Service Railroad, the headquarters of which are at Newark, N. J., purchase their power from the Public Service Electric Company. The electric company has seventeen power houses well distributed over the State, having a total capacity of about 200,000 kw. As the demand for railway and other power increased it has proved to be desirable to add a power plant which should embody the latest practice in order that energy may be generated at the lowest possible cost. This involved first a site which would have facilities for securing coal both by rail and water, an ample supply of circulating water for condensers, an area large enough for a substantial coal storage and a location from which power could be distributed all over the system with minimum loss. Such a site was found on the Passaic River about 2½ miles east of the business center of Newark, and midway between it and the Marion power plant of the company. The Essex plant was designed for an ultimate capacity of about 200,000 kw., but the layout provided a gradual evolution on the unit system in such a way as to permit economical operation from the start. How this was done will appear from a study of the illustrations accompanying this article.



NEW PUBLIC SERVICE POWER PLANT—VIEW FROM PASSAIC RIVER SHOWING COAL-HANDLING STRUCTURE, BOILER HOUSE, TURBINE ROOM, SWITCH HOUSE AND SCREEN HOUSE

General Layout of the Plant

The plant consists of four main sections; the turbine room, the boiler house, the switch house, and the coal bunkers and coal-handling equipment. The turbine room at present contains two 25,000-kva., 13,200-volt, 60-cycle, three-phase General Electric turbo-alternators. A 35,000-kw. unit of the same type is in process of installation, while a 50,000-kva. unit has been ordered for delivery in 1919. The turbine room is unusually spacious, as provision has been made for turbine units much larger than those now installed. All of the turbine auxiliaries are located below the main turbine room floor, which is thus left unusually free of obstructions. The absence of switching apparatus in or adjacent to the turbine room also conduces to the general appearance of simplicity.

The boiler house is contiguous to the turbine room and is laid out on the unit system, with the firing aisles at right angles to the axis of the turbine room. Each row of boilers contains four 1373 hp. (*i.e.*, 13,723 sq. ft. heating surface) cross-drum B. & W. boilers of the marine type. Under each is a sixteen-retort underfeed Sanford Riley stoker, the largest yet built. In the basement below the boiler floor are the forced-draft blowers, one for each boiler, the ash-handling apparatus, and the boiler auxiliaries. Above the boiler floor are the economizers of B. F. Sturtevant make, eight in number. These have each a heating surface of 7750 sq. ft. Two steel stacks are in place at present, having a height of 250 ft. above the grate and an inside diameter of 16 ft.

The switch house contains six floors, and it is separated from the main building by a space 25 ft. wide. The two buildings are connected by a bridge. On the lowest floor are generator main oil switches with auxiliaries, lightning arresters, transformers and switching apparatus for the power-house 440-volt service, and a cable testing outfit. The next two floors above are principally occupied with reactance coils, storage batteries, and sundry switching apparatus. On the fourth floor are feeder and other oil switches and the electric kitchen, dining room and general offices. On the fifth floor are the group buses, more oil switches, conduits for the control circuits and more offices. The control room, with bench boards and instrument panels arranged on the radial plan, is on the top floor, as are also the offices of the load dispatcher and the station electrician. The generator buses with aluminum cell arresters are also on this floor.

At the northeast corner of the main building is the double coal tower, behind which is a coal bunker struc-

ESSEX POWER PLANT DATA

Generating Capacity—1917, 50,000 kw.; 1918, 85,000 kw.; 1920, 135,000 kw.; ultimate, 200,000 kw.

Dimensions of plant as shown in general view:
Boiler House, 166 ft. x 116 ft., 106 ft. high.
Turbine Room, 167 ft. x 90 ft., 113 ft. high.
Switch House, 70 ft. x 117 ft., 95 ft. high.

Boilers, eight in number—13,723 sq. ft. of heating surface. Pressure 225 lb. per square inch, superheat 100 deg. to 150 deg.

Furnaces—Grate area, 200 sq. ft., ratio to h. s., 1:63½. Stokers, 16-retort, underfeed type, electrically driven.

Economizers—Eight in number, 7750 sq. ft. of heating surface, 56 per cent that of boilers.

Generating and distributing voltage—13,200.

ture having V-shaped bunkers with axes set along the line of the boiler-room firing aisles. The double tower is 215 ft. high, and is equipped at present with one 600-hp. electrically-driven hoisting engine operating a 2-yd. clam-shell bucket at a hoisting speed of 1300 ft. per minute. The tower is complete for a double equipment of this kind and the second hoisting unit will be added in the near future. At the present time coal can be taken from a barge at the rate of 180 tons per hour and this rate can be increased by the use of a larger bucket, for operating which the equipment has ample capacity. From the tower the coal is transported to the bunkers on a Robins conveying belt.

With the general plan of the Essex plant in view, the routes of the several materials involved in its operation may readily be traced. These will be taken up in order as follows: Coal and ashes, from barge to dump; circulating water from the river and back again; the water steam circuit; air and flue gases from source to stack outlet, and finally the electrical circuits.

FROM BARGE TO ASH DUMP

As the coal is elevated from the barge it is dumped from the buckets into a hopper projecting from the side of the tower, clearly visible in the general view of the station, thence it falls by gravity into the crusher, and onto the belt conveyor already mentioned. The hoist is driven by an induction motor and the properties of the latter are used in forcing it to pump back power into the line when the bucket is descending. The main coal bunkers hold about 2000 tons and they are tapped into a 15-ton Robins weighing larry traveling in each firing aisle. The coal is weighed as it is drawn from the bunkers and the loss of weight is also noted as each boiler hopper is charged, thus furnishing a check on the coal consumption. Each hopper holds about 7 tons.

The stoker drive for each firing aisle consists of four 12-hp. four-speed motors, two of which drive jackstaffs, while two drive through Reeves conical variable-speed transmissions. The driving speed can be varied between 32 to 290 r.p.m., corresponding to coal feeds of 1600 and 15,000 lb. per boiler per hour.

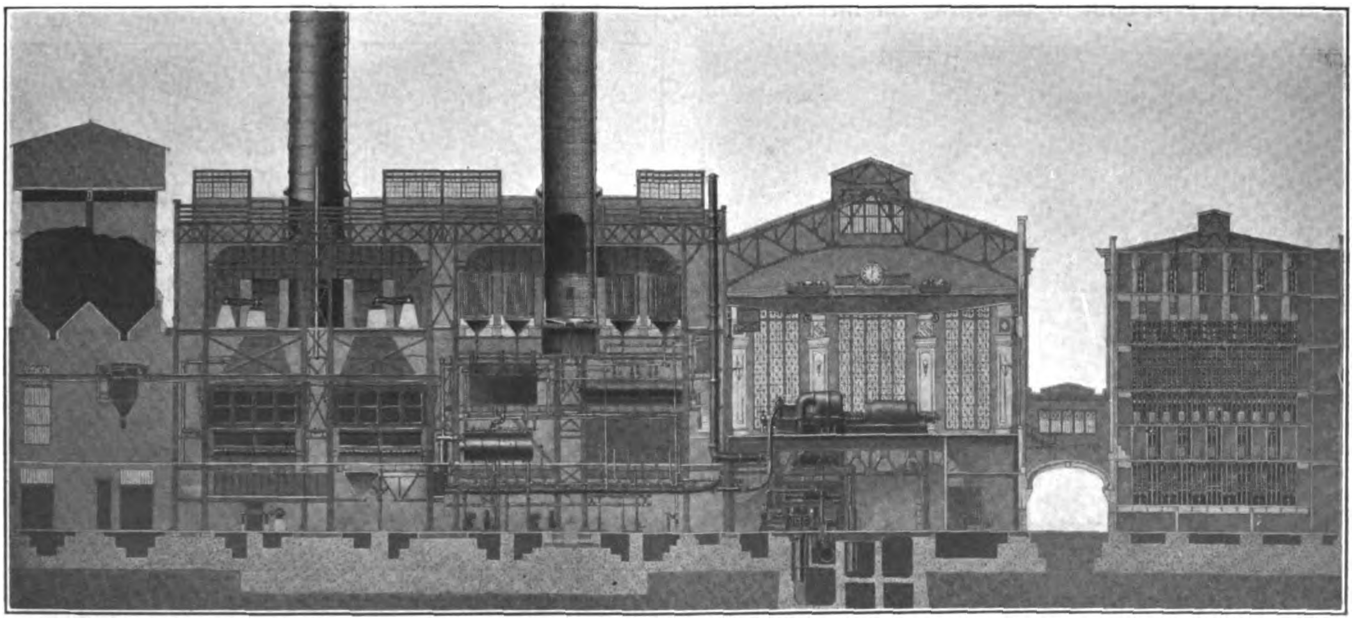
From the furnaces the ashes are tapped into small cars running on an industrial railway below the boilers and hauled by storage-battery locomotives. For some time to come the ashes will be distributed in the vicinity of the plant, where the land lies quite low. It is planned to fill it in to a depth of 4 ft. so as to furnish a coal storage space well elevated above tidewater. Eventually it is planned to utilize a considerable area for coal storage by means of a gantry crane. For the present a locomotive crane is being utilized to load and unload cars both for emergency coal supply from the adjacent railroad and for temporary storage.

ROUTE OF THE CIRCULATING WATER

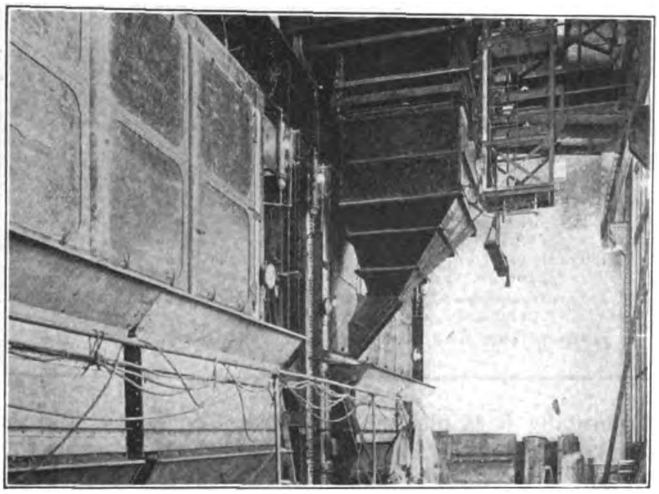
Circulating water for the condensers is taken in from the river through three intake tunnels each of cross-section 9 1/3 ft. x 8 ft. It passes through motor-driven revolving screens located in the screen house shown at the right in the general view, thence to the condensers through centrifugal pumps, each of 24,000 gal. per minute capacity, of which there are two for each unit, one motor driven and one turbine driven. Normally the turbine pump is operated but the electrically-driven pump is automatically added whenever the temperature of the discharge water rises above a given limit. Westinghouse surface condensers are hung directly below the turbines, rigidly connected thereto and supported on springs. Each of these contains 6434 1-in. tubes 12 ft. long, giving an area of 1.28 sq. ft. per kilowatt. The condensers are of the two-pass, radial-flow type. The discharge from the condensers passes out through two discharge tunnels 12½ ft. x 9 1/3 ft. in section which rest on top of the intake tunnels.

THE WATER STEAM CIRCUIT

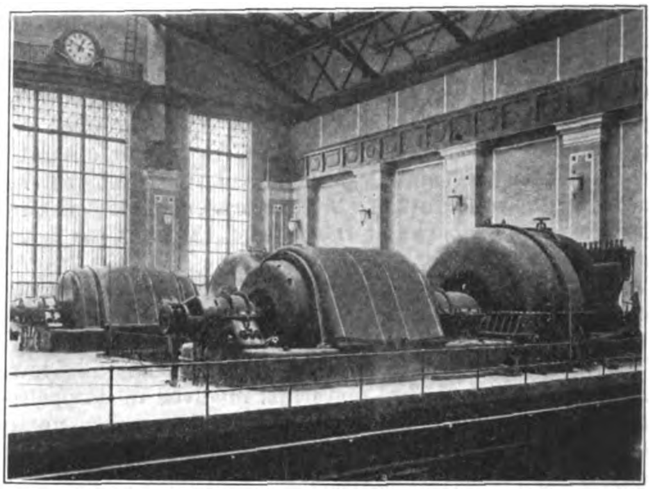
From the storage tank where the condensate is collected and make-up water added the feed water first goes through two Cochrane open, metering, feed-water heaters, thence to the boiler pumps which it reaches at a temperature of about 164 deg. Fahr. The boiler feed pumps are turbine-driven and, by means of a Foster



NEW PUBLIC SERVICE POWER PLANT—SECTION THROUGH ENTIRE PLANT



NEW PUBLIC SERVICE POWER PLANT—CONSTRUCTION VIEW IN BOILER ROOM SHOWING WEIGHING LARRY



NEW PUBLIC SERVICE POWER PLANT—25,000-KVA. TURBO-GENERATORS, PRESENT EQUIPMENT OF TURBINE ROOM

regulator, a constant difference is maintained between the feed-water pressure and the steam pressure. A Copes feed-water regulator is also used to maintain the proper water level in each boiler. From the pumps the water passes through the economizers which raise its temperature to 244 deg. Fahr., at which temperature it is fed to the boilers.

From the boilers the steam flows to the turbines at 225 lb. per square inch pressure through headers and cross-connected steam lines, laid out to give as direct service from boilers to turbines as possible and yet to provide for emergency routes for the steam. The boiler superheaters raise the temperature from about 100 deg. superheat at normal load to 150 deg. at 300-per cent rating, to which they are designed to be forced.

From the condensers, in which a 28¾-in. vacuum is maintained, the condensate is removed by turbine-driven hotwell pumps which deliver it to large surge tanks through V-notch meters. The air in the condensers is removed by LeBlanc hurling air pumps, motor-driven, one for each unit. Each of these requires a 100-hp. motor.

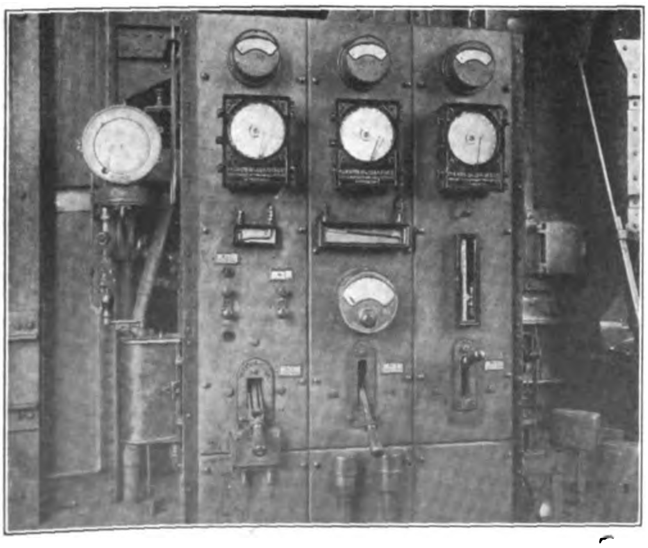
ROUTE OF THE AIR AND OTHER GASES

As the boiler air supply comes in part through the electric generators it will be necessary to trace this air from the point where it first enters the plant. Before passing to the generators all air goes through washers of the spray type built by the Spray Engineering Company, being drawn through these by the fans on the generator fields. On coming from the generators the air is directed into the stoker fan rooms where there is for each boiler a 150-hp. Sturtevant multivane fan, capable of delivering 60,000 cu. ft of air per minute against a 7-in. water pressure. The air supply is controlled by a Mason regulator. While each boiler has its own fan, all of the fans in one row discharge into a common duct provided with dampers to permit adjustment of the fan capacity to the demand.

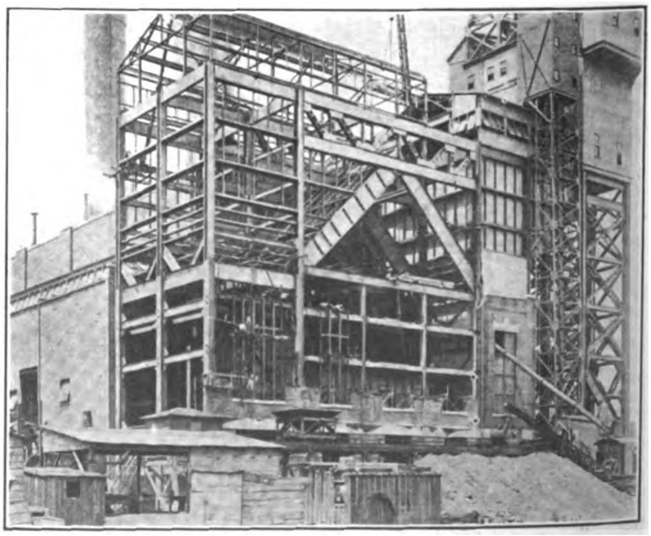
On leaving the boilers the gases may be directed to the stack by one of three routes. They may go direct to the stack, through the economizers to the stack, or through the economizers and the induced-draft fans to the stack. Dampers are provided to permit ready adjustment of the flue operating conditions to the demands of the load. The induced-draft fans, four in number, are each of 100,000 cu. ft. per minute capacity, against a 2-in. suction at the entrance to the economizers, requiring each a 100-hp. motor.

THE ELECTRICAL CIRCUITS

The electrical circuits in the plant can be considered in three general groups, one the 13,200-volt circuits from generator to feeder line, the second the low-voltage alternating-current circuits used for the power plant motors and lighting, and finally the direct-current circuits used for reserve excitation, control circuits, locomotive battery charging, etc.



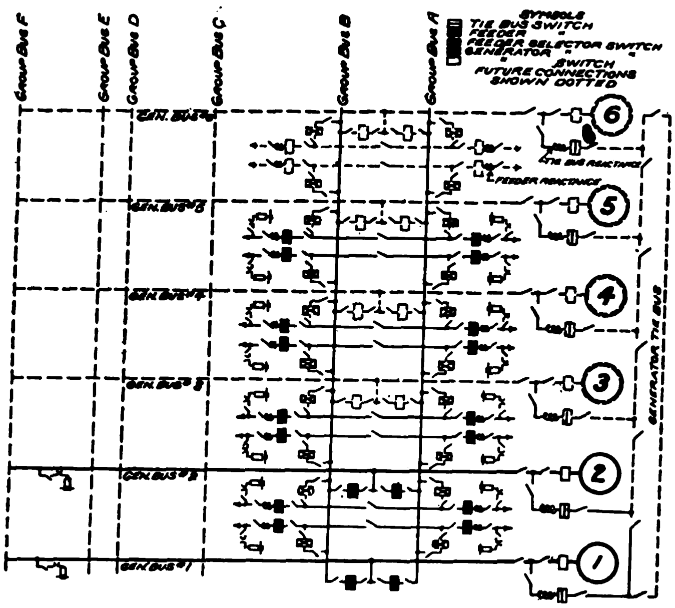
NEW PUBLIC SERVICE POWER PLANT—CONTROL AND MEASURING APPARATUS FOR ONE BOILER



NEW PUBLIC SERVICE POWER PLANT—CONSTRUCTION VIEW SHOWING COAL BUNKER STEEL WORK

To begin with the generators, it should be noted first that each of these has a continuous volt-ampere capacity rating of 25,000 kva. and generates at 13,200 volts. The speed of these machines is 1800 r.p.m., and they are equipped each with a 100-kw., 250-volt direct-connected exciter.

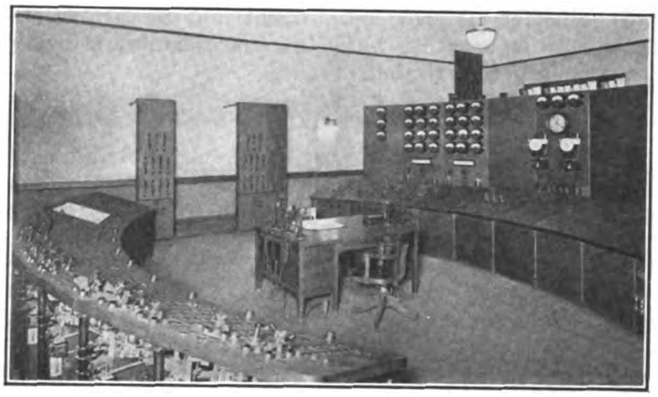
The general arrangement of the electrical apparatus on the six floors of the switch house has already been mentioned. The scheme of connection of this equipment is as shown in the accompanying electric circuit diagram, in which the important pieces of equipment are represented by conventional symbols. The switching equipment is laid out to give the maximum of flexibility, allowing for easy transfer of groups of feeders from one generator to another, the isolation of generators or groups of feeders, and the paralleling of generators and feeders, all with minimum risk to the plant through the effects of short-circuits.



NEW PUBLIC SERVICE POWER PLANT—SIMPLIFIED DIAGRAM OF MAIN CIRCUITS

Eventually there will be six group buses with switches for connecting any one or more to any one or more generators, and there will be a looped generator tie bus for the purpose of paralleling the generators. For the present there will be but two group buses.

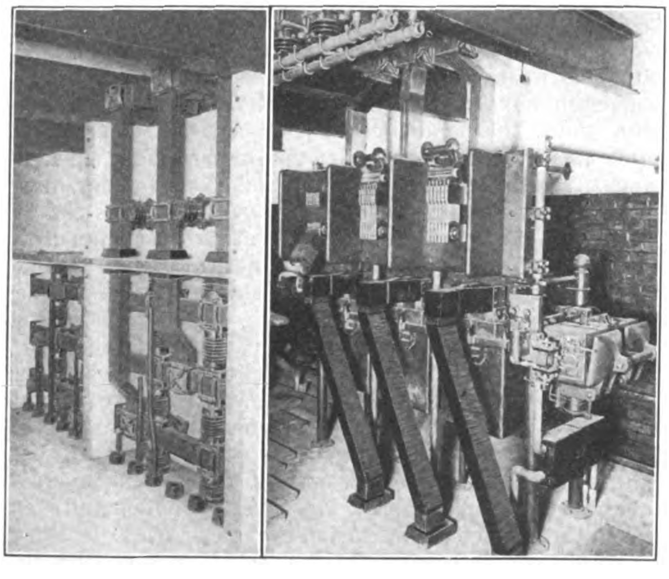
The route of the power from generators to feeders is this: Generator—generator switch—disconnects—bus selector switch—group bus (through disconnects on each side of switch)—feeder selector switch—feeder switch—reactor—feeder line. Between the generators and the tie bus will eventually be the current-limiting reactors shown in the diagram which will be installed this year. Electrolytic lighting arresters, with horn gaps, are installed on all feeders and also on the generator buses.



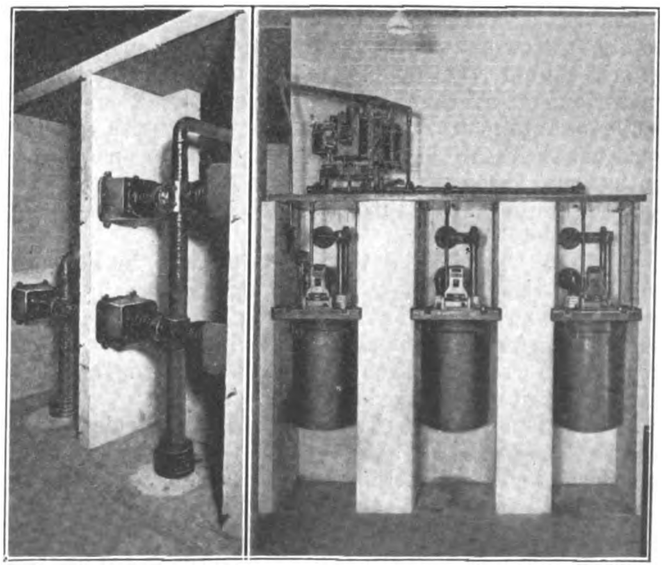
NEW PUBLIC SERVICE POWER PLANT—MAIN CONTROL BOARD ON SIXTH FLOOR OF SWITCH HOUSE

Typical views of the switching and bus equipments are shown in the accompanying illustrations. The switches are solenoid operated. The generator selector switches are non-automatic, but the others are provided with relays respectively as follows: Generator main oil switches, reverse power relays operating on full load power reversal; tie-bus switches, inverse selective overload relays with high time setting, operating only in case a short-circuit is not opened by the feeder or feeder-selector oil switches; feeder-selector oil switches, time-element overload relays to operate only in the case of the failure of the feeder-oil switch; feeder-oil switch, time-element overload relays for radial feeders and special relays for tie feeders to other power plants. The high-voltage buses are of bare flat copper, and the generator and feeder selector leads are of copper tubing insulated with cambric and braided. The switches and buses are mounted in compartments of concrete brick, special attention being given to provide unusual mechanical strength.

The excitation of the generators is normally from the exciters mounted directly on their shafts. Auxiliary to this normal supply there is a 150-kw. motor-driven exciter which can be quickly substituted for the local excitation on any machine, and in addition an exciter



NEW PUBLIC SERVICE POWER PLANT—440-VOLT GROUP BUS AND CONNECTIONS—POWER TRANSFORMER OIL SWITCH



NEW PUBLIC SERVICE POWER PLANT—BRACED GENERATOR LEAD—THREE-PHASE FEEDER OIL SWITCH storage battery is provided automatically to furnish excitation in emergency, while the spare exciter is being brought into commission.

HOUSE SERVICE POWER SUPPLY

In this plant the fullest possible use of electric power has been used for driving auxiliaries, most of which are operated by means of three-phase motors. This power is supplied through two 3000-kva. transformers, and a third will be added this year. The power circuits supply current at 440 volts. For lighting there are two 200-kva. single-phase transformers supplying current at 250 and 125 volts on the three-wire system.

"Safety Car" Operation

Importance, with One Operator, of Automatic Devices—Comparison of One-Man and Two-Man Service

AMONG the papers scheduled for presentation at the meeting of the Iowa Electric Railway Association on May 24-25 was one on "safety-car" (or one-man) operation, and the use of safety devices on such cars, by C. H. Beck of the Westinghouse Traction Brake Company. Owing to the abandonment of the convention, the facts given in the paper are released for publication by the association secretary and the author.

Mr. Beck said that automobile competition emphasized the necessity of the adoption for street railway transportation of lighter units, more frequent headway and a faster schedule. As an example of the possibilities of the light-weight safety car, the figures given in the accompanying table were presented. In this table line A is in operation, whereas line B is proposed for operation. The total car-hours per day were taken as representing 365 days of the year, because in many instances the extra service on Sunday equals the extra service on week days.

From this table it will be noted that the wages in the old service were 27 cents per hour and in the safety-car service 29 cents. The latter amount was a voluntary raise by the organization in question because of the economy effected and the desire to be fair with the operator, who contributes his share toward making such economy possible.

Present practice with the heavy cars now in use establishes 9 m.p.h. average speed as a first-class condition, and this is about the maximum that can be obtained, but with safety-car operation on a single track this figure can be raised to 10 m.p.h. with cars under as low a headway as five minutes. With switches and meeting points farther apart, the average scheduled speed could be still higher. On double-track lines, with safety-car operation, an average scheduled speed of 12 m.p.h. is easily maintained. In fact, one company, with experience with cars of this type, is proposing to operate at an average speed of 15 m.p.h. in a city where a great portion of the line is through what is called the "business district."

It should be recalled that this increase in average scheduled speed is not secured by an increase in maximum running speed or free running speed but through efficient performance of all the individual factors which pertain to car operation and movement so that the factor of safety is not decreased.

It might be considered remarkable that service heretofore performed by two men can be combined and placed under the direction of a single person and still be accomplished in less time and with greater accuracy than before. This has been well demonstrated, however, in actual practice where the car operator is provided with all labor-saving devices demonstrated as practicable. The operation of these devices involves the use of compressed air, as that is the most reliable and flexible medium obtainable for the performance of the various operations. With the old type of car and an average scheduled speed of 9 m.p.h., and average number of stops of six per mile, fifty-four stops are required per hour or practically one a minute. This means that the motorman is literally tied to the hand brake lever and has no opportunity to develop or expand his mental faculties. If this burden is removed a means for greater mental efficiency on the part of the car operator results.

	LINE A 3.32 Miles Long. 4000 to 5000 Passengers per Day. Safety Cars Now in Operation		LINE B 5 Miles Long. 8000 to 8500 passengers per Day. Safety Cars Proposed for Operation		
	Old Cars 18-Ton, 40-Passenger, Double Truck Cars	*Safety Cars* 6-Ton, 29-Passenger. Single Truck Cars	*Old Cars* 15-Ton, 26-Passenger, Single Truck Cars	*Safety Cars* 5-Ton, 30-Passenger, Single-Truck Cars, to Duplicate Old Service	*Safety Cars* 5-Ton, 30-Passenger, Single-Truck Cars, to Improve Old Service
Number regular cars in service..	3	4	9	9	10
Number extra cars in service....	3	5	2	2	5
Total....................	6	9	11	11	15
Minutes headway, regular cars..	15	10	7	7	6.3
Minutes headway, including extra cars...................	7½	5	5.7	5.7	4.2
Car-hours, regular cars........	54	74	154	154	164
Car-hours, extra cars..........	21	34	6	6	30
Total....................	75	108	160	160	194
Car-miles, regular cars.........	485	698	1470	1470	1750
Car-miles, extra cars...........	179	299	55.86	55.86	190
Total....................	664	997	1525.86	1525.86	1940
Average kw.-hr. per car-mile....	2.41	.99	2	.7	.7
Power cost per day at 1 cent per kw.-hr..................	$16.00	$9.87	$30.51	$10.68	$13.58
Labor cost per day at 27 cents per hour, per man..........	$40.50	......	$86.40	......	......
Labor cost per day at 29 cents per hour, per man..........	......	$31.32	......	$46.40	$56.26
Car maintenance, 1.5 cents per car-mile................	$9.96	......	......	......	......
Car maintenance, 1 cent per car-mile................	......	......	$15.25	......	......
Car maintenance, ¾ cent per car-mile................	......	$7.48	......	$11.44	$14.55
Total labor, power and maintenance per day	$66.46	$48.67	$132.16	$68.52	$84.39
Total labor, power and maintenance per year..........	$24,257.90	$17,764.55	$48,238.40	$25,009.80	$30,802.35
Saving per year..............	......	$6,493.35	......	$23,228.60	$17,436.05

From the viewpoint of safety, the apparatus should provide that an air-brake application occurs unless the operator holds his hand on the controller handle or performs some other conscious act. This has sometimes been referred to as a dead man's feature in the controller handle, but its use with safety-car equipment extends beyond the uses in which it was previously employed. With the modern pneumatic equipment, the brakes are applied, the sand is distributed and the doors and steps manipulated by one operation, or an emergency stop may be made in which all of these operations occur under the conditions consistent with emergency requirements, the doors and steps being either opened or permitted to remain closed but unlocked, so they may be opened by hand, as desired. These operations establish the safety car as a safer operating unit than any car heretofore in service on city lines, notwithstanding the fact that it is controlled by a single person. Time also is saved.

The foregoing remarks concern particularly the railway company and its patrons. There is, however, a more important consideration in that the entire nation is engaged in the conservation of energy and resources. The difficulty of securing men for car operation is becoming exceedingly great from day to day, and unquestionably will remain so. Moreover, the demand for men in the service of the nation becomes greater, so that the movement in favor of the safety car can properly be considered a patriotic and economic necessity.

Up-State New York Lines Need Relief

Commission Data Show That Companies Must Curtail Quantity and Quality of Service or Secure Higher Rate of Fare to Avoid Financial Disaster

By THOMAS CONWAY, JR., Ph. D.
Professor of Finance, University of Pennsylvania, Philadelphia, Pa.

EVERYONE who has made a close study of the financial results of operation of the electric railways has realized for a number of years that a radical readjustment of fares was inevitable. Many have thought that the railways have unduly delayed an effort to secure relief from the rising "cost of living" and the decreasing purchasing power of the nickel. Whatever may have been the hopes and expectations of railway managers concerning better things in the future, the outbreak of the European War and the active participation of the United States in the conflict have forced their hands.

Electric railways are at the crossroads. They must either radically curtail the quantity and the quality of service which has been rendered to the public, or secure a higher rate of fare, if they hope to avoid financial disaster. The pending and expected applications before the New York Public Service Commissions, therefore, are of the greatest importance not only to the railways directly involved, but to the entire industry. They mark the beginning of a general movement, the outcome of which will determine the future of the electric railway industry and the status of its securities.

This article will not deal with the problem of the electric railways in New York City. To demonstrate the financial needs of these companies and the inadequacy of the present rate of fare should be comparatively easy. Their affairs have been subject to continuous supervision and inquiry by the First District Commission, while most of the properties have been recently valued by the commission in connection with reorganization matters.

EARNINGS OF THE UP-STATE PROPERTIES

The up-State electric railways approach the problem under different circumstances. Practically none of these companies has been the subject of recent valuations. They operate under widely dissimilar circumstances, and the financial results of operation are not uniform. The suggestion, therefore, has come from some quarters that there is no general principle involved, and that each company must not only make its own application for specific relief but must establish that there is an unusual emergency demanding immediate action. While there is no doubt that the form of relief to be granted to the several up-State companies will differ to a great extent with individual properties, yet it is important at this stage to get clearly in mind that there is an emergency affecting all properties alike. This emergency warrants united action by the electric railways, and generous and prompt treatment by the Public Service Commission.

The financial results of operation of the up-State properties, which is the subject of this study, have been growing continuously less favorable throughout recent years. The results for each year from June 30, 1911, to June 30, 1915, inclusive, for which official statistics are available in the published reports of the Public Service Commission of the Second District, are as shown in the accompanying table.

Although gross operating revenue increased during these five years more than $4,000,000, net operating income, or the amount remaining after operating expenses and taxes had been deducted, increased only $100,000. As a result of a decline in non-operating revenue, the combined gross income of the up-State properties showed an actual decrease during this period. To earn this gross income required a continuously increasing investment which, it must be remembered, was made only with the specific consent and approval of the Public Service Commission in each and every case. Interest charges increased almost $3,000,000, while "other deductions," or rentals and interest on the floating debt, increased almost 50 per cent in these five years. The result was a most alarming decrease in net income from $4,294,000 in 1911 to $933,000 in 1915. If the figures for all the companies for the year 1916 were at hand the results would probably be even less favorable than those for 1915.

DECLINE IN MARGIN OF SAFETY PROTECTING BONDS

The decreases in net income have been most disquieting to the security holder. The margin of safety for the bonds of the up-State electric railways, figured on the conventional method—that is to say, the ratio of net income remaining after satisfying interest requirements and rentals, to gross income—has shown an alarming decline, as follows: 1911, 41.1 per cent; 1912, 39.3 per cent; 1913, 19.9 per cent; 1914, 16.7 per cent, and 1915, 9.1 per cent.

As a rough average, a margin of safety of 40 per cent (assuming proper allowance has been made for the maintenance of property) is a fair showing. When this margin of safety steadily and rapidly declines, until the gross income is less than 10 per cent in excess of fixed charges, the corporations may, without exaggeration, be characterized as in a serious financial plight. What the showing for 1916 will be, when the commission publishes its completed figures, must, to a considerable extent, be a matter of surmise. That it will be not much, if any, more favorable than for 1915 is almost certain. The showing for the year ending June 30, 1917, must be even less favorable.

LARGER REVENUES OR POORER SERVICE

Even though the entrance of America into the European struggle did not make practically certain still

FINANCIAL RESULTS OF OPERATION OF UP-STATE PROPERTIES, JUNE 30, 1911, TO JUNE 30, 1915

	1911	1912	1913	1914	1915
Railway operating revenue	$27,041	$28,010	$30,234	$32,062	$31,127
Railway operating expenses	16,796	17,827	19,456	20,741	20,228
Net revenue—railway operations	$10,245	$10,183	$10,778	$11,321	$10,899
Railway tax accruals	1,442	1,535	1,784	1,961	1,991
Railway operating income	$8,804	$8,648	$8,993	$9,360	$8,909
Other operations, net revenue	642	660	683	735	709
Non-operating income	981	1,288	608	636	649
Gross income	$10,427	$10,597	$10,284	$10,731	$10,267
Interest charges	$5,293	$5,441	$7,009	$7,656	$8,037
Other deductions	840	981	1,220	1,338	1,296
Net income	$4,294	$4,174	$2,055	$1,737	$933

Note.—The last three figures are omitted in all columns.

higher prices, and consequently less favorable operating results, there can be no question that the electric railway officials would be recreant in their duty to the security holders and to the public were they not, vigorously and persistently, to seek relief from the conditions above disclosed. Under the conditions now confronting them, they have no alternative. They are well within the truth when they state that they must either secure a higher return or, to live under present tariffs, must make a choice, in a large number of cases, between curtailing service or facing bankruptcy.

DECLINING RETURN UPON CAPITALIZATION

The average rate of return of the up-State electric railways upon their total capitalization during each of the five years from 1911 to 1915 inclusive compares as follows: 1911, 4.87 per cent; 1912, 4.91 per cent; 1913, 4.57 per cent; 1914, 4.28 per cent, and 1915, 4.01 per cent.

If a comparison is made upon the basis of the percentage which net income—available for the payment of dividends—after the payment of interest charges, rentals and other similar deductions, bears to the total capital stock outstanding, the showing is even more unfavorable: 1911, 3.44 per cent; 1912, 3.33 per cent; 1913, 1.75 per cent; 1914, 1.45 per cent, and 1915, 0.77 per cent.

The Supreme Court of the United States has on many occasions affirmed the right of a public utility to earn a reasonable rate of return upon the fair value of its property. Surely it cannot be contended that the above average rate of return is *prima facie* adequate. Of course, the opponents of fare increases will argue that there is no assurance that the value of the up-State properties is equal to their capitalization and that a considerable part of the capital stock is not represented by assets. It must be emphasized, however, that there is no proof of the gross overcapitalization of these companies, and that, on the contrary, there is much evidence to substantiate the existence of original value behind a good proportion of the outstanding capital stock.

It is important in this connection to note that the entire increase in capitalization of the up-State companies in the five years covered in the foregoing comparison has been in the nature of funded debt. The comparative amount of stocks and bonds outstanding in each year and the proportion which the funded debt bears to the total capitalization is as follows:

Year	Total Funded Debt	Total Capital Stock	Percentage of Funded Debt to Total Capitalization
1911	$89,197,100	$124,741,975	41
1912	90,723,100	125,216,742	42
1913	107,622,100	117,058,230	47
1914	131,220,025	119,517,230	52
1915	135,117,990	120,326,085	52
			Per cent increase or decrease
Increase—			
1911-15	45,920,890	......	51
Decrease—			
1911-15	......	4,415,890	4

GROWING DISPROPORTION OF BONDED DEBT

Experience points to the necessity of preserving a proper relationship between bonded debt and capital stock. The bondholder is a creditor who, in return for a low interest rate, demands protection against the risks incident to the operation of the business. The stockholder assumes the risk in expectation of a higher rate of return. One of the most disquieting features of the recent history of electric railways in the Second District of New York—in fact, throughout the country—has been the steady increase in the proportion of the total capitalization represented by funded debt. The same tendency has existed for some years in the case of the railroads. It means an inevitable weakening of the security for the bondholders, for the amount of capital invested by the stockholders and the income from this capital, which furnishes protection to the bondholders, is steadily dwindling. It is a matter of common knowledge to public utility operators and investment bankers that the reason for the sale of bonds and the disuse of stock as a method of financing has been that stock could only be sold upon terms which were so disadvantageous to the company as to commend them neither to the corporation nor to the public service commission.

This movement cannot continue indefinitely, even if the rate of return upon each dollar of capital invested remained as favorable as formerly. With the declining rate of return, the time has come when the electric railways, with few exceptions, find that they are able to sell bonds upon continually less favorable terms. The most serious aspect of the entire financial problem to the public is the inability of the electric railway to command new capital, which means the inability of these utilities to provide additional cars, to extend tracks as the cities expand, or in other ways to keep pace with the country's progress.

HOW LABOR COSTS HAVE INCREASED

It is not the purpose of this study to dwell at length upon the unfavorable general conditions which have brought about the financial plight of electric railways, not only in up-State New York but throughout the country. Every element of operating cost has shown a steady and alarming increase. The census of 1912 showed that 63 per cent of the total operating expenses of the electric railways of the country represented payments for labor. Substantially the above proportion is represented by the labor bill of the railways in the Second District.

The reports of the several companies to the up-State commission enable one to measure the extent of the increase in labor costs during the last few years. Most of the companies in reporting wages, prior to the year ended June 30, 1909, based their figures upon the monthly compensation paid employees. The decreasing length of the working day and the consequent necessity for a larger number of men to handle the same volume of work made a comparison upon this basis very untrustworthy. With the year 1909, therefore, the majority of companies began to report wages upon an hourly basis. If the wages for motormen and conductors of those up-State companies which reported both for the years 1909 and 1915 are compared, the extent to which this important element in the cost of operation has increased can be seen. A similar comparison might be made for other classes of electric railway employees, but the results would be substantially the same as that shown for the platform men in the table on page 1047.

The data in this table, which covers considerably more than half of the total companies operating within the Second District (all of those reporting such data for these years), are worthy of study. Only three out of the thirty-three companies listed have avoided advancing wages of motormen and conductors. Each of these companies was paying, however, relatively high wages in 1909. Four companies have advanced wages in the seven years ranging from 1 per cent to 10 per cent; seven have advanced wages from 11 per cent to 15 per cent; eight from 16 per cent to 20 per cent; three from 21 per cent to 25 per cent, while eight companies have granted advances exceeding 25 per cent of the former rates.

Official statistics are not available concerning the increases in the costs of various classes of materials

AVERAGE HOURLY WAGES OF CONDUCTORS AND MOTORMEN

Name of Company	Motormen 1909	Motormen 1915	Motormen % Inc.	Conductors 1909	Conductors 1915	Conductors % Inc.
International Ry.	$0.230	$0.291	26	$0.230	$0.256	11
Schenectady Ry.	.244	.287	18	.239	.287	20
Buffalo & Lake Erie Trac. Co.	.187	.272	45	.159	.268	68
Hudson Valley Ry.	.220	.280	27	.220	.280	27
Yonkers R. R.	.226	.267	18	.228	.263	15
Westchester Elec. Ry.	.230	.268	16	.226	.266	17
Auburn & Syracuse Elec. R. R.	.205	.271	32	.205	.267	30
Western N. Y. & Penn. Trac. Co.	.180	.210	17	.180	.200	11
N. Y. & Stamford Ry.	.223	.267	20	.217	.257	18
Elmira Water, Light & R. R. Co.	.192	.211	10	.180	.201	17
Orange Co. Traction Co.	.197	.230	17	.197	.230	17
Niagara Gorge R. R.	..	.246	..	.200	.251	25
Kingston Consolidated R. R.	.209	.233	12	.203	.226	11
Syracuse & Suburban R.R.	.192	.250	30	.183	.250	36
Cortland County Trac. Co.	.170	.190	12	.167	.190	14
Peekskill Lighting & R. R. Co.	.186	.203	9	.186	.203	9
Elmira & Seneca Lake Trac. Co.	.189	.223	18	.186	.217	17
Buffalo Southern Railway	.190	.250	31	.190	.250	31
Wallkill Transit Co.	.200	.215	8	.200	.217	8
Corning & Painted Post St. Ry.	.189	.220	16	.187	.220	16
Syracuse & South Bay Elec. R. R.	.227	.285	25	.222	.283	27
Buffalo & Williamsville Elec. Ry.	.200	.206	3	.200	.206	3
Ogdensburg St. Ry.	.155	.168	8	.154	.168	8
Troy & New England Ry.	.200	.239	19	.200	.238	19
Eastern New York R. R.	.202	.221	9	.200	.200	..
Huntington R. R.	.180	.228	26	.170	.214	25
Hudson River & Eastern Trac. Co.	.200	.200	..	.200	.200	..
Glen Cove R. R.	.180	.227	26	.170	.214	25
Buffalo & Depew Ry.	.150	.200	33	.150	.200	33
Rochester & Manitou R.R.	.250	.250	..	.250	.250	..
Northport Traction Co.	.180	.212	18	.170	.195	15
Putnam & Westchester Trac. Co.	.187	.209	12	.187	.209	12
Adirondacks Lakes Trac. Co.	.210	.280	33	.210	.280	33

which are used by electric railways. It is a matter of common knowledge, however, that there have been large increases in the cost of coal, copper, steel, crossties and the other materials extensively used by such properties. The increases of the prices of these materials has been particularly great within the last few months and is largely responsible for the present very acute situation.

RELIEF SHOULD BE PROMPTLY GRANTED

The advances in wages have been due to conditions over which the electric railways had no control. There is no assurance that the present scale of wages will represent the high point. In fact, the rapidly mounting cost of living points strongly to the possibility of further increases, involving a proportionate increase in almost two-thirds of the total operating expenses of the average electric railway. It is the duty of the electric railway to retain a skillful, experienced working force, and this can only be done by paying the wages which such employees can secure in other industries.

It is largely because operating expenses will greatly increase in the immediate future that the electric railways are now asking for emergency relief. Such relief should be promptly granted. Valuations will require a period of several years, particularly in view of the fatc that practically all of the properties must be valued at the same time. If years elapse before relief is granted, the credit of the electric railways will be destroyed or seriously impaired. It should be kept in mind that the public service commissions exist not only for the protection of the traveling public, but also for the protection of the investor in public utilities. The duty of the commission both to the rider and to the investor clearly points to the need for specific action without delay.

Alderman Henry D. Capitain, chairman of the local transportation committee of the Chicago City Council, has proposed that $5,000,000 of the $21,000,000 Chicago traction fund be used to purchase Liberty bonds. This was referred to the finance committee.

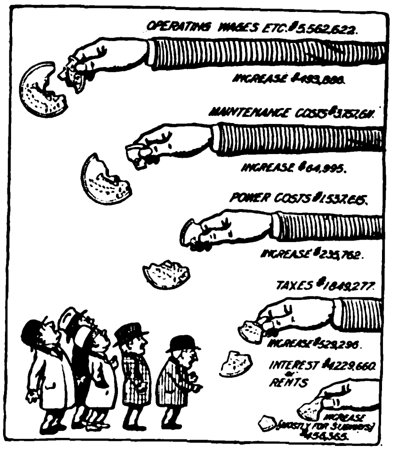
New York Fare Hearings Postponed

City Two-Cent Transfer Question to Be Taken Up June 18—Examples of B. R. T. Publicity

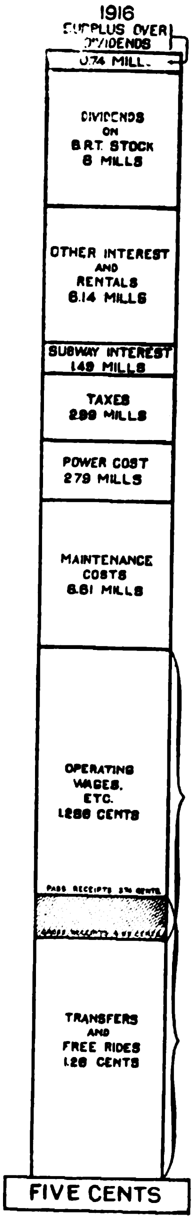
At the request of counsel the hearings upon the applications of street railway lines in New York City for financial relief were postponed from June 6 to June 18. From the appearances noted, it is evident that the companies' plea will meet with much opposition on the part of the city, civic organizations and labor unions. It is expected that each application will be taken up in turn, the Third Avenue Railway, the New York Railways and the Brooklyn Rapid Transit Company being the first three companies appearing. These railways, as before announced, have asked for a 2-cent transfer charge. The New York & Queens County Railway and the Second Avenue Railroad, whose applications were for general relief, have been directed to amend them to specify the form of relief desired.

In extending its publicity work to show the need of increased revenues, the Brooklyn Rapid Transit Company has been issuing car pamphlets discussing various phases of the situation. In one, entitled "Tearing the Nickel Apart," the illustration from which is reproduced herewith, the company discusses the various increased costs of operation shown. In another, entitled "How the Nickel Shrinks," the company used the accompanying illustration to show an analysis of receipts and expenditures per passenger in 1916. Still other recent pamphlets have been one on "Credit," showing how improvements depend on credit and credit on profits, and one on "Dollars per Minute," giving various transportation costs on a minute basis.

How Much Will The Nickel Stand?

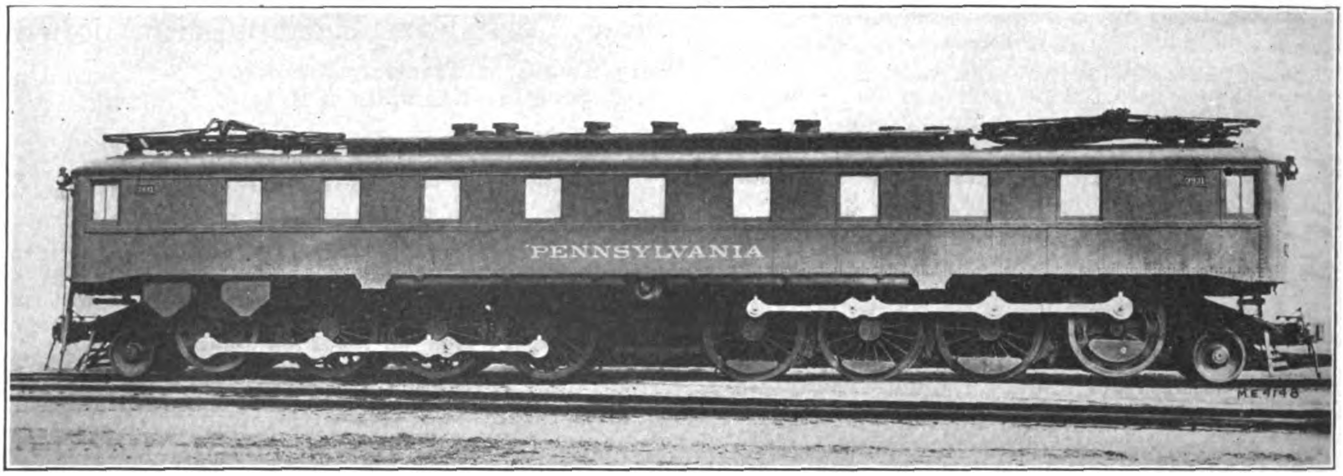

OPERATING WAGES ETC. $5,562,622.
INCREASE $493,886.
MAINTENANCE COSTS $3,757,611.
INCREASE $64,995.
POWER COSTS $1,537,615.
INCREASE $235,762.
TAXES $1,849,277.
INCREASE $529,296.
INTEREST & RENTS $4,229,660.
INCREASE (MOSTLY FOR SUBWAYS) $456,365.

Increased B. R. T. Costs nine months ending March 31, 1917, compared with same period of previous year.



ILLUSTRATIONS FROM B. R. T. CAR PAMPHLETS

The "Credit" pamphlet gives the following essentials of a first-class street railway: Honest financing; high-grade construction and equipment; efficient and courteous operators; satisfactory volume of business; ample margin of profit; well-established credit, and liberal policy toward community needs.



PENNSYLVANIA LOCOMOTIVE—NEWLY COMPLETED UNIT DESIGNED FOR FREIGHT SERVICE OVER THE ALLEGHENY MOUNTAINS

Novel Locomotive for the Pennsylvania

This Latest Type of Electric Locomotive, Which Has Been Built by the Pennsylvania Railroad for Trial Service, Has a Twin-Motor, Spring-Geared, Jack-Shaft Drive with Side Rods Coupled to Three Pairs of Driving Wheels for Each of Two Articulated Trucks

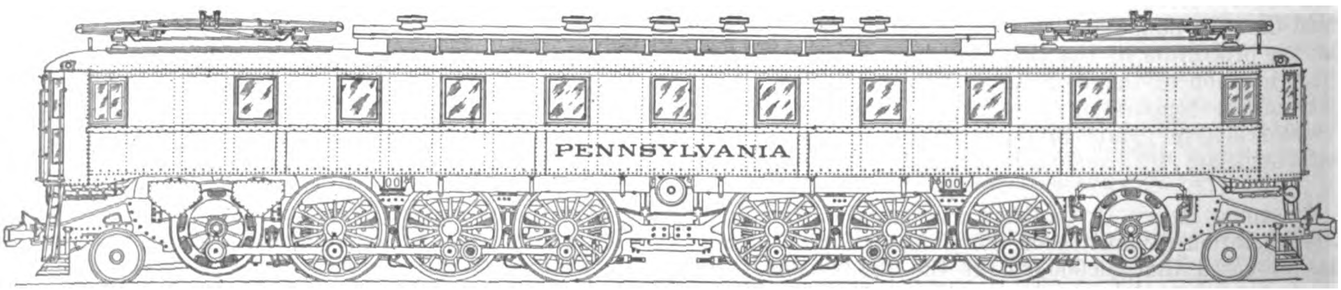
WHAT promises to mark an important step in the application of electric motive power to steam railroad service appears in the completion of a new type of electric locomotive for trial service on the Pennsylvania Railroad. The new machine, which was built at the railroad company's Altoona shops, and was electrically equipped by the Westinghouse Electric & Manufacturing Company at East Pittsburgh, Pa., has been designed for hauling the heavy freight traffic over the Allegheny Mountains between Altoona and Johnstown, Pa. This run covers a distance of about 37 miles, including the famous Horse Shoe Curve, and the gradients are extremely heavy, the maximum being a 12-mile stretch at 2 per cent. The freight traffic over the division averages about 300,000 tons a day.

Opportunity for service trials on the Pennsylvania Lines exists on the Philadelphia-Paoli suburban division, which was electrified about two years ago at 11,000 volts single-phase, these being the power characteristics of the new locomotive. However, as this suburban division offers only limited chances for service tests on heavy grades and with heavy train loads, the engine possibly may be transferred later to the Bluefield Division of the Norfolk & Western Railroad for further trial. The latter road has, on its electrified division, conditions similar in many respects to those that will be encountered when the locomotive goes finally into regular service on the Pennsylvania Railroad's Altoona Division, that is to say, heavy freight traffic and steep grades. It should be noted here, however, that the Altoona Division has not yet been electrically equipped, the proposed conversion having been indefinitely postponed on account of conditions arising from the war.

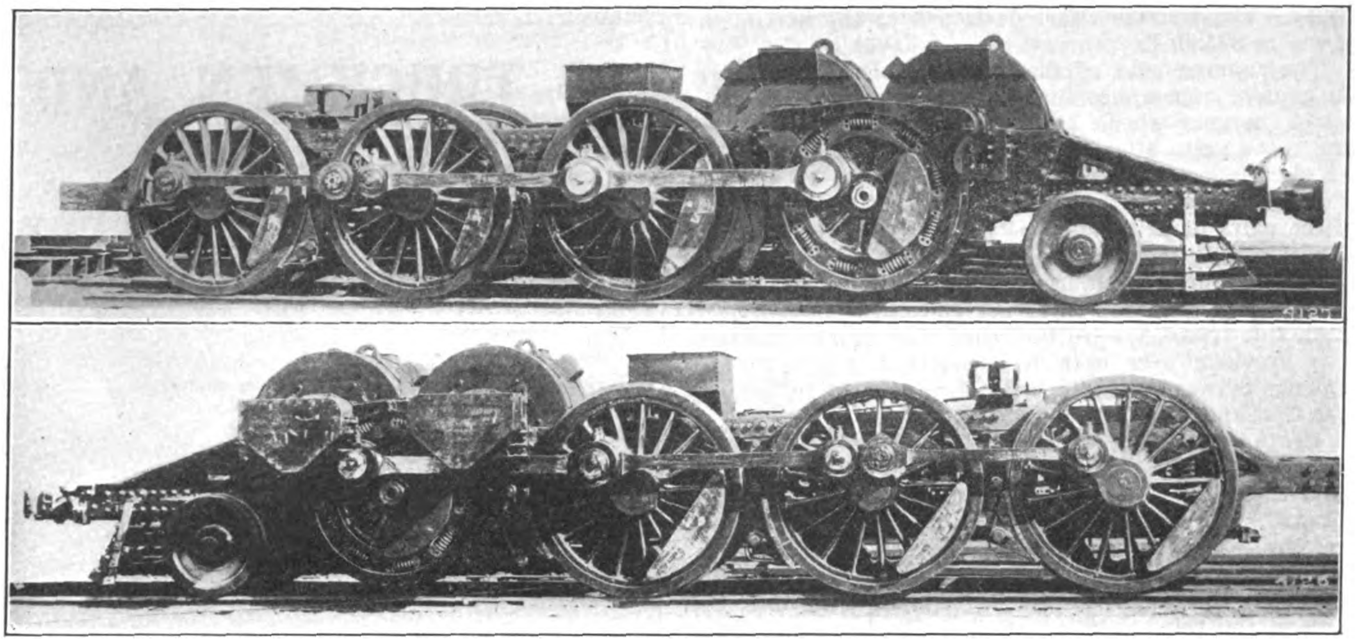
Electrically, the new engine is quite similar to the Baldwin-Westinghouse electric locomotives used on the Norfolk & Western Railroad. Energy is derived from an 11,000-volt, single-phase, 25-cycle overhead contact system through pantograph collectors. In the locomotive, the power is changed from single-phase, by means of a phase converter, to the three-phase form, and then is fed to induction motors of the slip-ring type.

There are four motors, each with a rating of 1200 hp., giving the locomotive a rating of 4800 hp. Two motors are mounted on each truck frame and they are geared to a jack shaft from which the three pairs of driving wheels are driven by connecting rods. Springs which are provided in the gears of these jack shafts are so adjusted as to give the effect of a solid gear up to a tractive effort equivalent to 25 per cent of the weight on drivers, thus producing the solid-gear effect under ordinary operating conditions. As shown in the accompanying illustrations, these spring gears, except for their great size, are of the standard type. However, the teeth are cut to a rather flat spiral, and as the gears on each end of the motor and jack shaft are cut right-hand and left-hand respectively the combined effect is that of herring-bone gearing.

A feature of the motor design, which has been planned to give the greatest possible core length for the armature, is the use of a hollow armature shaft through which leads are extended to collector rings at one end of the shaft outside of the pinions. Thus the full length



PENNSYLVANIA LOCOMOTIVE—ELEVATION SHOWING ARRANGEMENT OF JACKSHAFTS AND DRIVERS

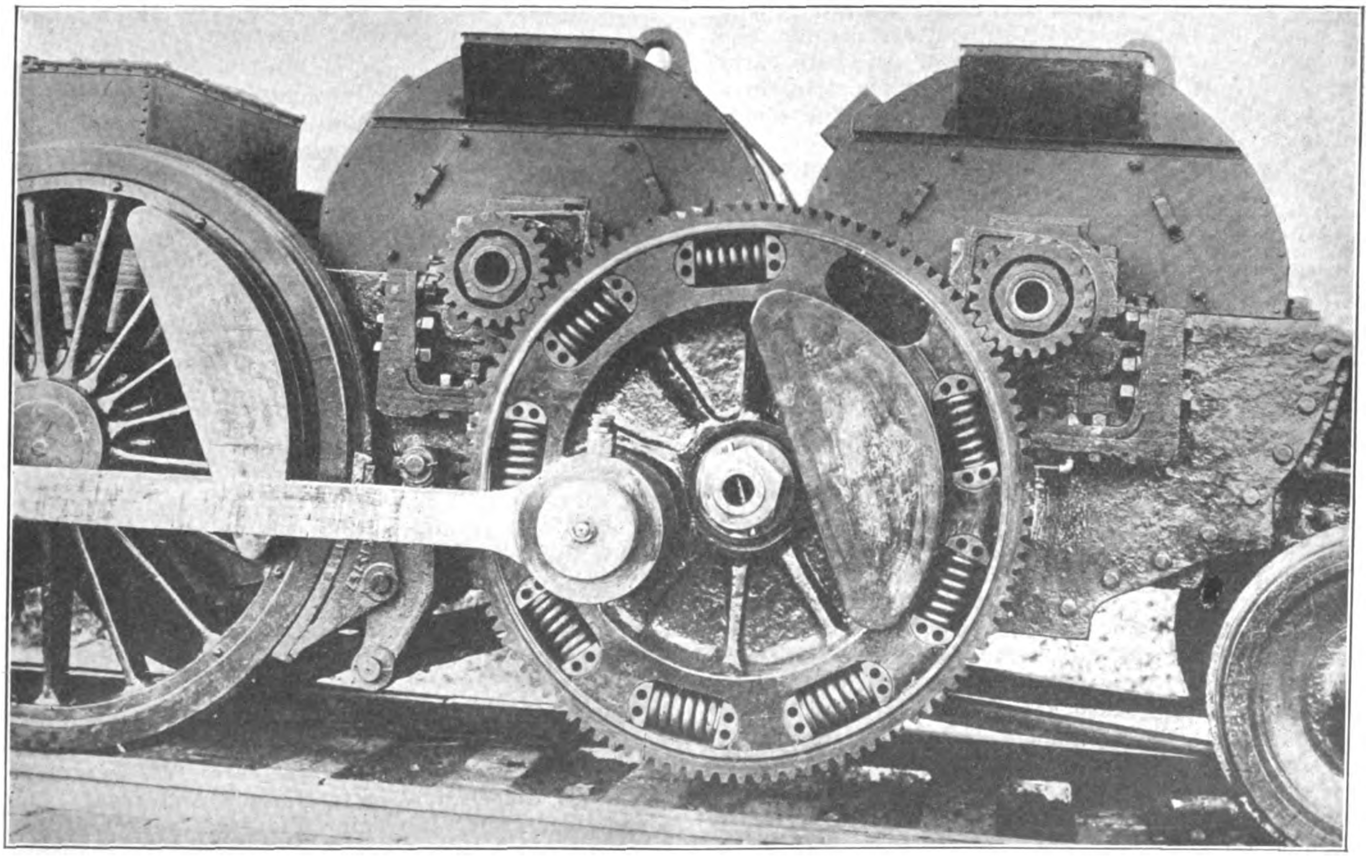


PENNSYLVANIA LOCOMOTIVE—VIEWS OF RIGHT AND LEFT SIDES OF HALF UNIT WITH CAB REMOVED

between clearance lines is utilized in the motor construction and the cost and weight of the motor are minimized.

There is provided only one normal operating speed, this being 20.6 m.p.h., obtained with the motors in parallel. This speed is the maximum that is considered safe for the heavy trains that these locomotives will be required to handle on the grades of the Altoona Division. A lower speed of 10.5 miles per hour may be obtained by connecting the motors on the same truck in "cascade," whereby the rotor windings of the two motors are coupled together with one motor's stator winding connected to the line and the other motor's stator winding short-circuited. This speed will be used only around yards and for other protracted slow movements, since cascade operation involves a low power factor. Intermediate speeds between zero and the maximum can be obtained by means of a water-rheostat control system similar to that in the Norfolk & Western locomotives, which permits a very close regulation of the tractive effort developed by the locomotive during acceleration.

Two of these engines, one pushing and one pulling, will be able to haul a 3900-ton train at 20.6 m.p.h. up the 12-mile grade of 2 per cent from Altoona to Gallitzin, and a 6300-ton train east bound up the 1 per cent grade from Johnstown to Gallitzin, a distance of 25



PENNSYLVANIA RAILROAD—VIEW SHOWING DETAILS OF SPRING GEAR AND MOTORS WITH HOLLOW SHAFTS FOR LEADS miles. The tractive effort developed at the maximum speed is 87,200 lb.

The running gear of the locomotive is quite similar in general appearance to that used for steam locomotives, the gear wheels being connected by side rods to the three pairs of driving wheels on each truck. For an electric locomotive, however, the location of the motors is unprecedented, since they are placed ahead of the three pairs of drivers, or between the drivers and the guiding-truck wheels. The spring rigging on each truck is of the three-point-suspension type, one suspension point being over the pony truck and the other two over each side frame, toward the rear. The usual equalizers are provided over each box, together with elliptical springs between journals and helical springs outside of the first and third journals.

Features of the structural details include inward projections from each gear hub to form the jack-shaft journals, the jack-shaft bearings being made up of solid bronze bushings forced into holes bored in the frame casting. The center plate of each truck is located halfway between the first and second axles at an elevation of about the height of the top frames. Between the second and third axles an auxiliary spring support for the cab has been installed for the purpose of equalizing the loads on the various drivers, or, in other words, to counterbalance the excess weight in front due to the location of motors between the pony truck and first pair of drivers. The contact between the caps over these spring supports and the bottom surface of the cab is necessarily a sliding one.

Each motor truck includes a pony truck of the Pennsylvania Railroad standard type, with an elliptical spring located each side of the axle and supported on T-links. As the usual T-links alone will not provide sufficient lateral motion, a rocker casting supported by the elliptic springs has been added. The combination T-links and rocker permit sufficient lateral motion for curves of 275 ft. radius.

Articulation between the motor trucks is effected by a construction that permits each truck to rotate around the center of its center plate without restriction. The pulling and pushing strains between drawbars carry through the trucks, as well as the articulation, in a direct plane 34½ in. above the rails, and the cab is entirely relieved of these strains.

The principal characteristics of the locomotive are as follows:

Over-all length	76 ft. 6¼ in.
Total wheelbase	63 ft. 11 in.
Driving wheelbase	38 ft. 8 in.
Rigid wheelbase	13 ft. 4 in.
Over-all width	10 ft. 1 in.
Diameter of driving wheels	72 in.
Weight on drivers	198 tons
Diameter of pony wheels	36 in.
Weight on each pony truck	21 tons
Total weight of locomotive	240 tons
Tractive effort	87,200 lb.
Speed	20.6 m.p.h
Horsepower at 20.6 m.p.h	4,800
Train load on 1 per cent grade	3,350 tons

Keeping Surface Railway Tracks Clear

THE New York Railways have sent copies of the poster reproduced herewith to heads of department stores, manufacturing establishments, trucking concerns and owners of motor trucks generally in connection with a campaign to secure co-operation in keeping the tracks clear. Some days previous to the sending out of the circulars President Theodore P. Shonts addressed letters to these men explaining the necessity for their assistance, and as a result hundreds of firms replied that instructions had been issued to drivers to keep off the car tracks whenever possible. Two of the large posters have been sent to each firm which has issued such instructions, with a request that they be displayed in shipping rooms in plain view of the actual drivers of trucks.

TO TRUCKMEN AND CHAUFFEURS

This Company is Cooperating with the City Authorities in Seeking to Improve Street Traffic Conditions.

◆ ◆ ◆

We ask you to help by keeping off the Car Tracks all you can.

◆ ◆ ◆

Street-cars must stay on the Tracks. They cannot ride around your car or truck. When the Street Car is delayed, you are causing inconvenience to the passengers.

Whenever there is room on the side of the Street

Please Don't Drive on the Car-Tracks!

POSTER USED IN NEW YORK RAILWAYS CLEAR-THE-TRACK CAMPAIGN

A British Tramway in Wartime

1100 Men Enlisted Between 5 P. M. and 9 A. M. the Next Day—3000 Men Now with the Colors—Other Activities

A LETTER that has been received in this office from James Dalrymple, general manager Glasgow Corporation Tramways, who is one of the best known and most successful electric railway operating officials in Great Britain, is published below as an illustration of the spirit displayed by our British Allies in the world's war for the ideals of democracy:

"Ever since the war started our staff has done a very large amount of war work. In September, 1914, immediately after the outbreak of war, the city of Glasgow decided to raise a number of battalions. Out of our own staff we raised a battalion of 1100 men between 5 o'clock in the evening and 9 o'clock the following morning. These men have been in France for a long time and have been doing excellent work. The city, during the winter of 1914-1915, and throughout the whole of 1915, carried on an extensive recruiting campaign, and our office here became at that time and has since remained the center of all the recruiting activity in the city.

"We have now 3000 men with the colors, and our male staff, as you can understand, is now very much depleted, especially that portion of the staff of military age.

"Early in 1915, after losing about 2000 men, we started women as conductors, and shortly afterwards we put them on the front of the cars. We have now about 300 women driving in Glasgow and about 1500 conducting. They are doing the work very well; in fact, in a short time I expect that every man available for military service will be away from the department.

"Quite recently we formed a battalion of volunteers for home defence, and this battalion is practically all composed of members of our own department. In many ways the staff of the department has assisted the military authorities. At the present moment, the whole of the military recruiting staff in the city is housed in our office here. We give them the use of the premises free.

"I think you may take it that what applies to Glasgow applies equally to the tramway staffs in every city in the kingdom. I shall be glad to hear that in America the street railway managers and their staffs are throwing themselves heart and soul into this business, so that we may get it finished up at the earliest possible moment."

Taking Care of Corner Stresses from Large D. C. Feeders

Insulators of Lignum Vitae Wood and 1½-in. Cold Rolled Steel Pins Solve San Francisco's Problem of Providing Required Insulating Qualities and Withstanding Crushing Stresses from Heavy Feeders and Heat from Overloaded Cables

By S. L. FOSTER
Chief Electrician United Railroads of San Francisco

IN the earliest days of electric street railroading with small cars, when the overhead feed wires were only No. 2, No. 1 or No. 0 B. & S., it was usually possible to get the wire safely around corners with the old standard electric light 1½-in. locust pin, bored and reinforced with a ⅜-in. carriage bolt down its center with a "deep-groove" glass insulator screwed upon it.

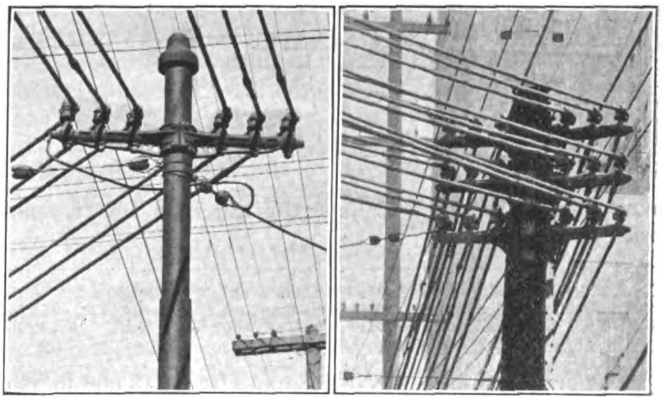
When, however, No. 0000 was adopted as the standard size feeder, this wood pin for corners had to be replaced with something stronger. In San Francisco in 1890 the substitute was a ¾-in. round wrought-iron pin, with a lead top threaded to correspond to the insulator. The glass insulator then proved to be the weakest feature of the combination and it was replaced with the composition corner-pin insulator.

The advent of the 500,000-circ. mil cable and larger for overhead feeders showed up the defects in the ¾-in. pin and composition corner insulator. The insulator crushed under the pressure at turns or softened when the feeder was overloaded and became hot, and the ¾-in. pin bent under the corner strain.

At this point there were two very different methods adopted in different parts of the country. In San Francisco the old plan of turning the conductor on a single pin was adhered to, and the dimensions and strength of this pin were increased again. Elsewhere various forms of "feeder wire strain clamps" or "cable clamps" were brought out, whereby the strain of the feeder cable was removed almost entirely from the corner pin and transferred to the crossarm, and often ultimately to an anchor guy.

Before going further it should be stated that the San Francisco heavy feeder line standard includes self-sustaining iron poles at corners and cast-iron cross arms with cold-rolled steel pins cast into the arms. The self-sustaining pole permits the elimination of guys in connection with taking feeders around corners. When the use of the 500,000-circ. mil feeder had shown the ¾-in. iron pin and composition insulator to be inadequate for corners, the size of the pin was increased to 1½ in. and it was made of cold-rolled steel, and identical in size, shape and threading with the standard wooden pin with 1⅛-in. diameter top. This pin proved equal to supporting the corner strain resulting from taking any size feeder up to 1,000,000-circ. mil cable around it without feeder strain clamps and guys, but the insulator was yet to be developed that would have the insulating qualities needed, and stand the crushing strain of such a heavy feeder at turns and the heat of an occasionally overloaded cable. This was accomplished by making the insulator of the well-known close-grained lignum vitæ wood.

Since the new standard of 1½-in. steel pins (1895) and lignum vitæ insulators (1904) were adopted not a pin has been broken nor has an insulator failed from crushing or burning on corners. Out of many thousands of the latter a very small number have failed on the straight line from checking or from internal defects in the wood, but after ten years of use nothing appeals to us in San Francisco as better for the purpose. Possibly where there is lightning these lignum vitæ insulators might not endure so long, or where there are ice loads on the feeders, extreme contraction strains or tornadoes the 1½-in. steel pins might not stand the strain so well. All that would be necessary in the last-named case, however, would be to increase the size of the corner pin to 2 in. and thereby increase the safe load by 137 per cent, as the strength of round pins varies as the cubes of the diameter. This increase in size of the pin to 2 in. would, however, necessitate redesigning the lignum vitæ insulator to accommodate the enlarged pin.

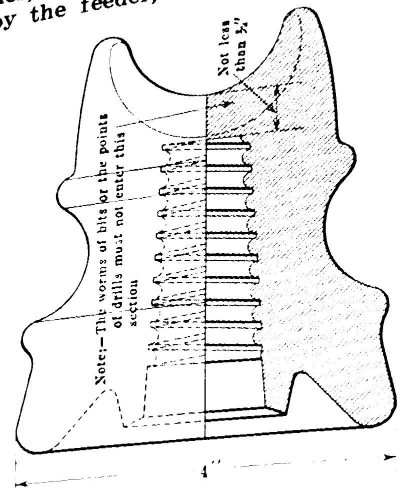

REINFORCED TUBULAR STRAIN POLE, AND BOX-GIRDER FEEDER-TURN POLE IN SAN FRANCISCO

Following the old standard wood-pin design, the steel pins were constructed so that the center of the feeder on a corner applied the pressure against the pin at a point 4 in. above the crossarm. Under those conditions, allowing 60,000 lb. as the ultimate strength of steel, a 1½-in. pin would stand a pressure of 2500 lb. with a factor of safety of two, as is conceded in the National Bureau of Standards' new safety rules to be sufficient for pins.

Under these conditions the bottom petticoat of the insulator is 2 in. above the iron cross arm. As 500 volts will not jump 1 in., and as the poles are not absolute grounds, it seemed to be quite safe to make this distance between insulator and arm 1 in., as in an actual case the bottom of the insulator had been only ⅝ in. above the iron arm at a corner pin for eleven years without producing failure.

With the pin thus shortened the load at the side score of the corner insulator was brought to within 3 in. of the iron cross arm and the safe load on the pin was made 3300 lb. with a factor of safety of two.

That this strength is ample is shown by the fact that the pressure against the side of the corner insulator at a 90-deg. turn, provided with two symmetrically arranged poles, each at the apex of an angle of 135 deg. included by the feeder, is as follows for the different size feeders assumed to have the sag in a 100-ft. span set opposite them:


Not less than ¾"
Note:—The worms of bits or the points of drills must not enter this section
4"

LIGNUM VITAE CABLE INSULATOR

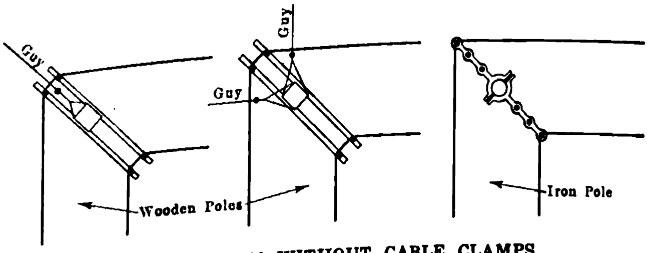
No. 0000 B. & S. double-braid weatherproof, 1 ft. sag....	710 lb.
500,000 circ.-mil double-braid weatherproof, 2 ft. sag....	950 lb.
1,000,000 circ.-mil double-braid weatherproof, 3 ft. sag....	1,125 lb.

The crushing strength of lignum vitæ is 13,000 lb. per square inch. In passing around one of these San Francisco designed insulators at an angle of 135 deg., included between the directions of the diverging parts of the feeder, a 1,000,000-circ. mil double-braid feeder covers 1⅜ sq. in., thus giving a factor of safety of twelve on the outside of the insulator. There are more than 7 sq. in. of area of contact inside the insulator between the wood and half the threaded 1½-in. steel pin, thus providing a factor of safety five times as large on the inside of the insulator as on the outside against a factor of two as exacted by the new safety rules for insulators.

The dense texture of this lignum vitæ insures its freedom from absorbing moisture, and its insulating qualities under 500 or 600-volt d.c. work have proved almost entirely satisfactory.

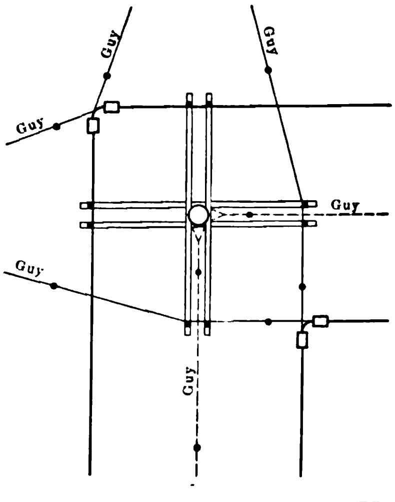
This hardwood insulator was originally designed for the points where it was needed most urgently, namely, on the corners. It was given a round top. When it was found to be cheaper than the other types of straight-line feeder-pole insulators on the market and free from the gradual leaning over or yielding of the composition ones, it was provided with a score on the top and now serves equally well for both feeder-cable uses, straight line and corners.

These lignum vitæ insulators had a severe fire test in the 1906 San Francisco conflagration where great copper cables were melted off and standard-pipe iron tubular poles were heated till they bent over the roadway. The wood insulators, though scorched and in a few cases charred, were ready for service after the ordeal, while the composition ones in all cases had swelled up under the heat and had become worthless for further use. As lignum vitæ wood was very scarce after this fire, in order to get the cars into operation as quickly as possible, insulators of the same shape were quickly turned at the mill from hickory and some from ash for straight line use to be replaced later by lignum vitæ ones.



FEEDER TURN WITHOUT CABLE CLAMPS

The drawings reproduced show the construction and dimensions of this hardwood insulator that has "made good" in San Francisco for the past eleven years. That we have confidence in it and that it justifies this confidence is shown by the statement that at one substation there are forty-eight heavy positive d.c. 500-volt feeders emerging in three different directions without a guy in sight, and at another substation forty feeders go out in several directions without guys to hold them, and no feeder less than 500,000 circ. mil in size. Where a heavy feeder is to be dead-ended at a station, the dead end is made right around the insulator. When it is to be held rigidly around an insulator at a turn, it is provided with a metal tie or "cinch clamp." The self-sustaining pole, the 1½-in. steel pin and the lignum vitæ insulator carry the load and no head guys or drop guys are required.



FEEDER TURN WITH CABLE CLAMPS

An examination of the cross-section of the insulator will show that there is a 4¼-in. creepage distance from the center of the side score to the grounded iron pin inside the insulators, 1½ in. of which is always under cover and dry. In all our experience with these insulators there have been no cases of electrolytic injury to the feeder at the insulator, though there have been cases where in our foggy climate feeders have been corroded badly out in the span at a small break in the weatherproof insulation.

When a cable clamp is attached to a feeder the clamp at once destroys the value of the weatherproof insulation, as in gripping the cable it must get through to the copper and thus demands a strain insulator between it and the crossarm. This clamp is now a bare live spot on the feeder and an element of danger. In foggy San Francisco such a combination invariably leads to leakage over the surface of the strain insulator to the grounded iron arm. The strand quickly corrodes at the cable clamp side of the strain insulator and the guy breaks unless replaced in time.

To get the best results it is absolutely necessary that these insulators should be made only of clear wood; for straight-line work the thickness of wood between the top of the pin hole and the bottom of the top score should be fully a half inch; that the pin hole should be bored with a bottoming drill and not with a bit having a worm at its end; that the insulator be given two good coats of linseed oil paint before being put out, and that the insulator be painted occasionally when in service. Some of them were exposed for about ten years without repainting in San Francisco without failure, but such treatment is inadvisable.

The use of the lignum vitæ insulator on corners in self-sustaining iron-pole work saves the cost of two cable clamps per feeder, two strain insulators, four pieces of guy cable, and the labor of installing them all and fitting and soldering jumpers; furnishes a cheaper, more durable and better looking job, permits more feeders to be accommodated on a given pole-head space and eliminates the danger of galvanized-iron guys corroding off at the positive side of the strain insulators from creepage of current.

In a case of a wood pole and two feeders as shown in the illustrations, its use at turns means one-half as many crossarms, one-half as many insulators, one-sixth or one-third as many guys, no cable clamps at all or strain insulators connected to feeders, no fitting of jumpers or soldering, a far neater looking piece of work and more feeders on the same pole-head space—in other words, less money spent for overhead material, lower labor and maintenance cost and a better looking job.

As a matter of fact, it is difficult to find a location in city work where feeders can be taken around a 90-deg. corner on a one-pole turn. On account of the wide sidewalk, the curved curbstone and the cesspool at the apex of this curve, these corners are usually contrived by a two-pole turn. The argument for the single pins, single insulators, crossarms bisecting the included angle of turn and self-sustaining poles, as against the cable clamps, double sets of crossarms at right angles to the lines of the conductors and guyed conductors and poles, still applies in the case of the two-pole turn.

Of the two photos of typical feeder-turn poles shown, one is of a box girder station pole with its load of eighteen heavy cables, fourteen 500,000-circ. mil and four 1,000,000-circ. mil, about one-third of a substation's d.c. load. There are twenty-five of this type of pole on the system.

The other photo is of an outlying tubular line pole with six 500,000-circ. mil cables besides serving as a pull-off pole for a double No. 00, 90-deg. curve. This pole is a standard-pipe, three-joint, 6-in., 7-in., 8-in. x 30-ft. pole, but is reinforced by a specially built steel beam inside as was described and illustrated on page 109 in the issue of the ELECTRIC RAILWAY JOURNAL for July 15, 1916. There are several hundred of this type on the system. Both poles are self-supporting and on both the lignum vitæ insulators are used, some of the round-top and some of the scored-top type. Both of these poles have been in service about twenty years and are as good as when set, as they have been protected from internal corrosion by being filled with concrete and from external deterioration by regular painting.

AMERICAN ASSOCIATION NEWS

Flag Raising at Hampton, Va.

Under the auspices of company section No. 10 and of its flag-raising-day committee, impressive flag-raising exercises were carried out at the carhouses in Hampton a few days ago. Music by the Soldiers' Home Band, and addresses by Hon. Harry Houston, speaker of the House of Delegates, Gen. Joseph F. Smith, governor National Soldiers' Home, and Col. W. S. Copeland, editor *Daily Press and Times Herald*, were the features of the exercises.

In opening the exercises, E. C. Kelly, president of the section, read a brief report of the action of the National Railway Association in pledging its support to the Government. In his address, Mr. Houston paid a high tribute to President J. N. Shannahan of the company for the patriotism displayed in every undertaking of the community, stating that as much as a year ago the company had responded to the call for preparedness in furnishing armory facilities for the local battery. The other speakers also expressed appreciation of the work of the company.

At the meeting of the section held on June 1 the flag-raising-day committee reported that the exercises had proved very popular in the community, and that Newport News was arranging similar exercises. At the preceding meeting of the section, held on May 10, home gardening was the topic of discussion. A representative of the Hampton Normal and Agricultural Institute gave a talk on this subject and distributed leaflets containing garden hints to the members. At this meeting, also, Mr. Staenglen spoke on rail bonding.

Bulletin on Coal Situation

The committee on national defense is sending out today the following bulletin to electric railway companies:

L. S. Storrs, president of the association and vice-chairman of its committee on national defense, acting for the association and the committee, has taken up with the coal production committee of the Council of National Defense the question of assuring to the traction utilities of the country a continued supply of fuel, and the committee makes this statement of the result of the conference with the approval of the National Council and at the request of F. S. Peabody, chairman of the coal production committee.

Mr. Storrs pointed out to Mr. Peabody that should a condition occur whereby the traction companies were, through lack of fuel, compelled to cease or interrupt their service, a great hardship would ensue for the communities served. The necessity of transportation service to the public was emphasized and the request was made that some plan for the preferential treatment of fuel consigned to public utilities be arranged on the same basis as that upon which fuel for steam railroads is to be handled during emergencies or when embargoes are in effect.

Mr. Peabody assured Mr. Storrs that such a plan for the preferential treatment of the public utility coal supply will be made effective, should emergency require it. It is, of course, essential in addition that each individual company insure as far as possible its own fuel supply by having on hand an ample reserve supply, particularly during the winter months. While it may at a later date be necessary to urge upon electric railways conservation of fuel by the elimination of such service as can be abandoned without serious detriment to the needs of the public, your committee feels that it can assure the companies that their needs will be taken care of and that there need be no fear of such a shortage as will necessitate the shutting down of public utility power plants.

Your committee intends to co-operate to the fullest extent with the coal production committee in conserving the fuel resources of the country and at the same time to co-operate with the individual companies, so that the traction lines can render the best possible service to their communities.

Section No. 11 Issues Handbook

The joint company section of the Toledo Railways & Light Company has just issued a booklet which should prove suggestive to other company sections. It is of convenient pocket size, 4 in. x 6 in., and comprises thirty-nine pages of text.

A preface signed by T. J. Nolan, chairman of the executive council, gives certain general suggestions to employees and outlines briefly the development of the section organized on Jan. 23, 1917. Following this is a copy of the constitution and list of officers and committeemen. Next the functions of the executive council and officers are explained and the requirements for membership in the several associations making up the joint section are listed, including a table of membership dues. A full list of members with home addresses, arranged by departments, is also given. Finally there are blank forms for use in applying for membership, correcting entries, and withdrawing from membership, as well as a table of attendance at the educational classes during recent months.

COMMUNICATIONS

Riding Qualities Not Affected by Equalization

L. B. STILLWELL, CONSULTING ENGINEERS
NEW YORK, June 7, 1917.

To the Editors:

Referring to W. H. Heulings's communication published in your issue of May 19, I wish to point out certain erroneous conclusions which he reached from reading my communication printed in your issue of May 5.

I do not lean toward a flexible side frame for any truck, but, on the contrary, stand straight up for the most rigid form of side frame. In my opinion, the necessary flexibility to secure proper equalization of weight on all four wheels of a truck should be provided for by the springs interposed between the journal boxes and the side frame, and by flexibility which is produced by the design of the transoms connecting the two side frames.

In his communication Mr. Heulings says: "The movement of the equalizer bar is restrained by springs which distribute the load." But the type of equalizer bar described by Mr. Bullock, and which is under discussion, rests directly on the journal box, and its vertical motion can in no possible way be restrained by springs or other means. In my opinion the name "arch-bar truck" is not applicable to the type referred to by me as having springs directly over the journal boxes. The name "arch-bar truck" is usually associated with the type having no journal box springs, and used principally under freight cars.

Mr. Heulings's suggestion that the skeptic should test the riding qualities of certain trucks of different design operating over the same roadbed was followed up by Mr. Potter's invitation to the skeptic to continue his investigation to the New York, Westchester & Boston Railway and neighboring roads, where trucks with equalizer bars and trucks with springs directly above the journal boxes can be compared in similar service. If the skeptic wishes to continue his comparison on a steam-operated road, the Erie Railroad offers an excellent opportunity to compare the riding qualities of the "time-tested" equalizer-bar trucks and the riding qualities of trucks fitted with springs over the journal boxes. The popular verdict is that the latter design, which is used under the Erie Railroad's all-steel cars, rides better than the older type of truck under that company's steel underframe or wooden cars.

However, in making his suggestion, Mr. Heulings is really wandering from the subject of equalization to that of comparative riding qualities, which is a totally different matter, as the skeptic can easily prove to his own satisfaction by close examination of the trucks referred to by Mr. Heulings. Among these the trucks with hard riding qualities can still claim complete equalization. F. M. BRINCKERHOFF.

Engineers in the C. E. R. A.

TERRE HAUTE, INDIANAPOLIS & EASTERN
TRACTION COMPANY
INDIANAPOLIS, IND., May 31, 1917.

To the Editors:

Some time ago you published an editorial suggesting a subdivision of the Central Electric Railway Association. I take it that in general the reason for a subdivision is to stimulate increased attendance of the engineers at the association meetings. However, if it amounted to anything at all, which no doubt it would, it would then soon develop into practically a separate association which would meet separately from the general association. As a result, other officials of the association, who would be interested in the engineering matters now occasionally discussed, would then not secure the benefit of such discussion.

It appears to me that a better plan would be the appointment by the association of a committee of engineers to keep in touch with other committees of the association, particularly the program committee for the purpose of arranging to have any subjects of interest to engineers incorporated in the program.

This committee could also recommend the appointment of other committees when necessary to which could be referred the standards of the American Electric Railway Engineering Association, and they could then either suggest adoption or changes as the case might be. The A. E. R. E. A. is doing excellent work, but many of the standards which it has proposed have not been generally adopted by member companies of the C. E. R. A. If such rules were referred to a committee which would be in touch with the American Association the reason for this condition could be investigated and a more general adoption of the rules would probably result. A. SCHLESINGER,
Superintendent Distribution and Substations.

Publicity Agents Meet

An informal gathering of a number of publicity agents employed by electric railway companies took place this week at St. Louis at the time of the meeting of the Associated Ad Clubs of the World in that city. A pleasant time was enjoyed by all, but those present decided to postpone action upon establishing a formal organization until the next meeting of the American Electric Railway Association.

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

One-Man Cars for Tacoma

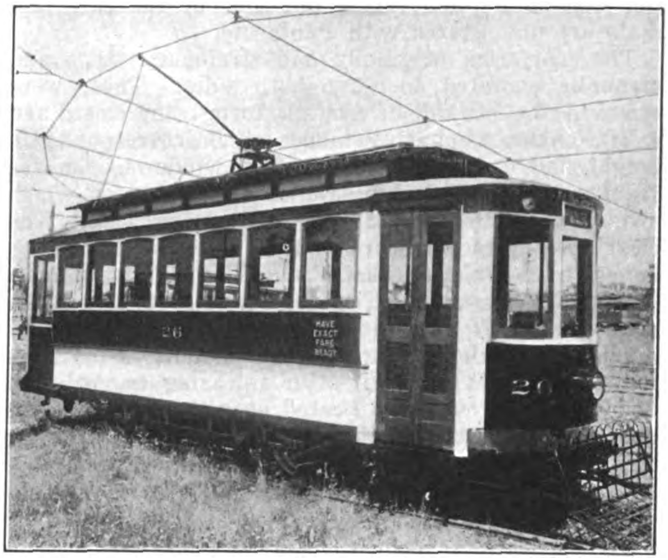
Rebuilt Cars of the Single-Truck Type Have Become Popular with Employees and Public

BY K. C. SCHLUSS
Superintendent of Power and Equipment Tacoma Railway & Power Company, Tacoma, Wash.

The Tacoma Railway & Power Company has recently rebuilt six of its old-style, single-truck, closed cars to make them suitable for one-man operation, the cost of reconstruction, inclusive of air brakes and prepayment facilities for double-end service, approximating $1,300 per car. By operating this equipment at one-half the former headway a very great increase in traffic—approaching 100 per cent—has been effected, and the public is very well satisfied.

Originally the cars were of the convex-concave-side type, with monitor roofs and drop platforms. They were equipped with Brill 21-E trucks and GE-58 motors and were operated with hand brakes. The rebuilding included a minimum amount of alteration to the bodies and platforms, together with the addition of Westinghouse semi-automatic air brakes, pneumatically controlled doors and steps, air sanders which are operated automatically in emergency, dead man's circuit-breaker control and other safety features. This type of equipment has been described in detail in the ELECTRIC RAILWAY JOURNAL of Sept. 2, 1916, under the title "Equipment of the Safety Car."

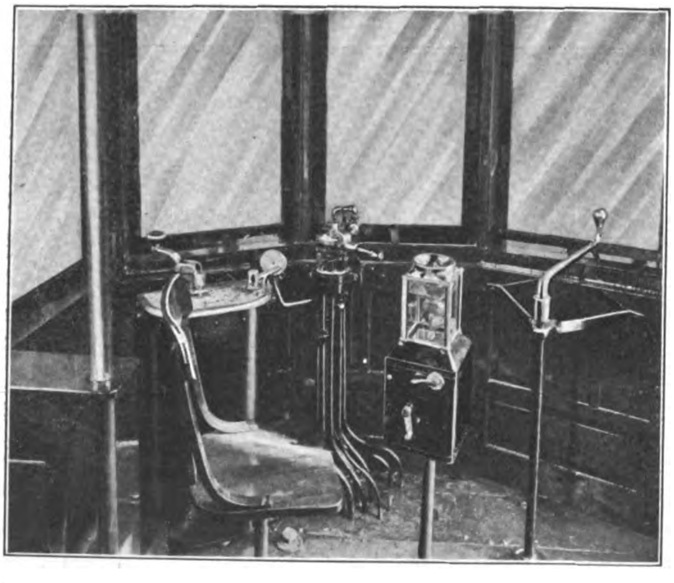
The general dimensions and weights are given in the table in the next column.



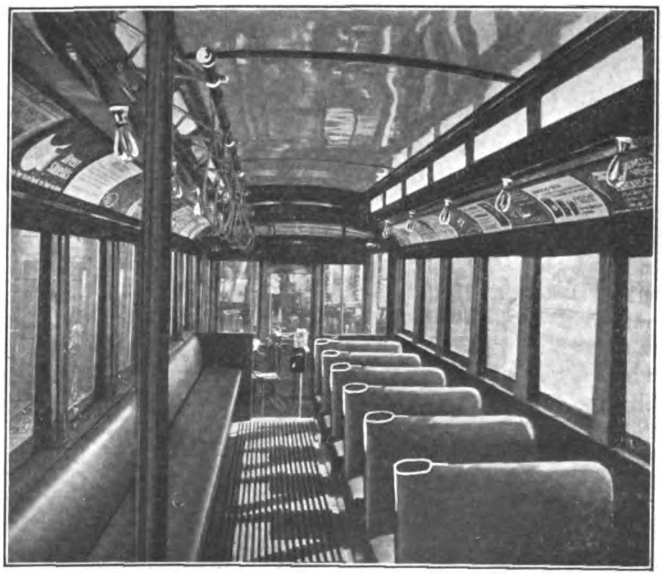
EXTERIOR VIEW OF REBUILT CAR

Length over all	31 ft. 0 in.
Length of body	20 ft. 0 in.
Width at sills	7 ft. 1 in.
Width over all	7 ft. 10 in.
Height—rail to step	16 in.
Height—step to platform	12½ in.
Height—platform to floor line	10 in.
Height—rail to floor line	38½ in.
Truck wheelbase	7 ft. 6 in.
Seating capacity	29
Light weight of car complete	24,200 lb.

The weight of the air equipment complete, including safety devices, piping, hangers, etc., is estimated to be 1350 lb. This is slightly higher than usual for this type of car, due to the use of a larger compressor than is generally required to operate the brakes and other apparatus. The company had on hand a number of Christensen AA-1 compressors and they were utilized on these cars. In order to conserve space a sheet-



FRONT PLATFORM WITH FARE BOX, CONTROL AND BRAKE EQUIPMENT AND REVOLVING CHAIR FOR OPERATOR



INTERIOR VIEW OF ONE-MAN CAR, SHOWING LONGITUDINAL AND TRANSVERSE SEATS metal housing was designed to replace the wooden box originally furnished with the compressors.

The principal changes made to the body proper include the removal of the bulkheads and the rearrangement of seats. The bulkheads are cut off at the height of the inside window sills, the lower portions being cased over and a 1-in. pipe stanchion extended from each section to the end plate which is arched to conform to the contour of the roof. The opening between the stanchions is 36 in. The preference of the public for cross-seats influenced the adoption of this type of seating plan so far as possible, but since the width between posts at the floor line is only 6 ft. 4 in. it was necessary to retain the longitudinal seat along one side of the car. All seats are upholstered with Pantasote.

The platforms originally had stationary steps and manually operated doors on both sides. These were removed, the left side of each platform being closed and a stationary window installed which corresponds in height and design to the vestibule windows. On the right side is installed a two-leaf folding door which swings out and against the body corner post. The clear opening of the door is 32 in. The folding step is supported by hinged brackets and operated automatically with the door. The doors and steps are operated entirely by air, excepting that with an emergency application of the brakes the door on the rear platform may be opened by hand, after releasing an ordinary door flush bolt which is located near the center of the door in plain view of anyone attempting to leave the car. The steps are lighted by a lamp above each door which is switched on and off automatically as the door opens or closes. This is accomplished by means of a contact connected to the door operating rod.

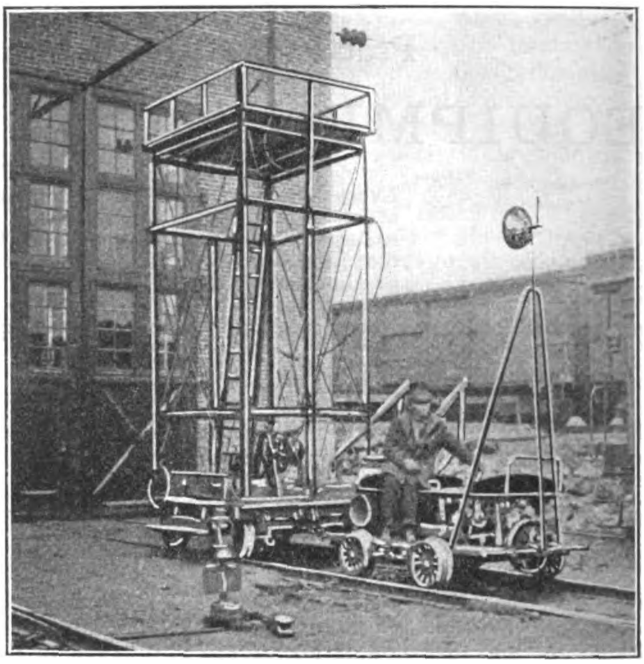
Miscellaneous equipment not previously mentioned consists of motorman's revolving stool, push buttons and buzzers for signaling motorman, Johnson fare boxes, International registers, "Golden Glow" headlights, rotary gongs and Earll trolley retrievers. Although the company's standard color for city cars is dark green, these cars are being painted maroon and cream to give them a distinctive appearance. One of the accompanying illustrations shows the arrangement of controller, brake valve, hand brakes, fare box and motorman's chair on the front platform, from which it will be seen that elaborate provisions for the operator's convenience have been provided. This has eventually resulted in making the one-man runs popular among the platform men, and in many cases they are claimed as preferred runs by senior men.

Line Car Saves Railroad $2,000 a Year

Gasoline-Propelled Maintenance Car Used on Hoosac Tunnel Electrified Zone of Boston & Maine

Before the Boston & Maine Railroad put in operation the lightweight gasoline-driven overhead maintenance equipment which is shown in the illustration, the line department used a tower mounted on an ordinary flat car. This required a steam engine, caboose, and a crew of eleven men to complete the equipment, while a foreman, two linemen and two groundmen are all that are required for the new outfit. The latter also gets to the scene of the trouble quicker, with the result that traffic delays due to line failures have been greatly reduced.

The motor car is driven by a four-cylinder Fairbanks gasoline engine, and is provided with an acetylene headlight mounted on a pipe standard on the front of the car. The reflector can be set at any angle, and is particularly useful in inspecting the wiring in the tunnel.



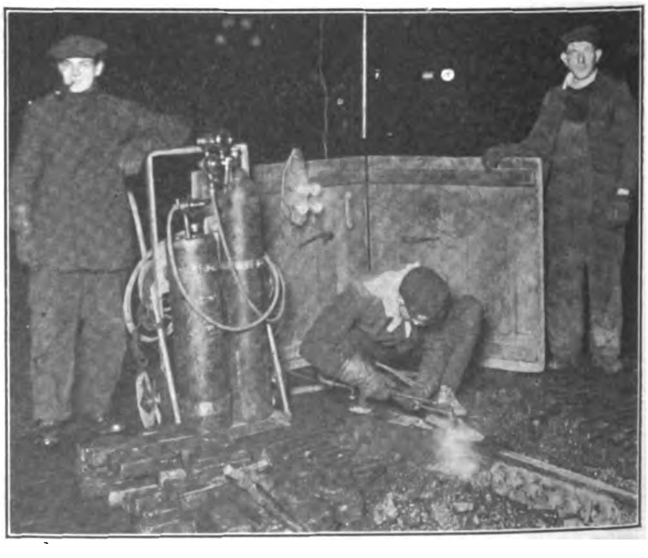
BOSTON & MAINE'S MOTOR-DRIVEN LINE CAR

The motor car will make a speed of 60 m.p.h. alone, and 20 m.p.h. when drawing the tower car.

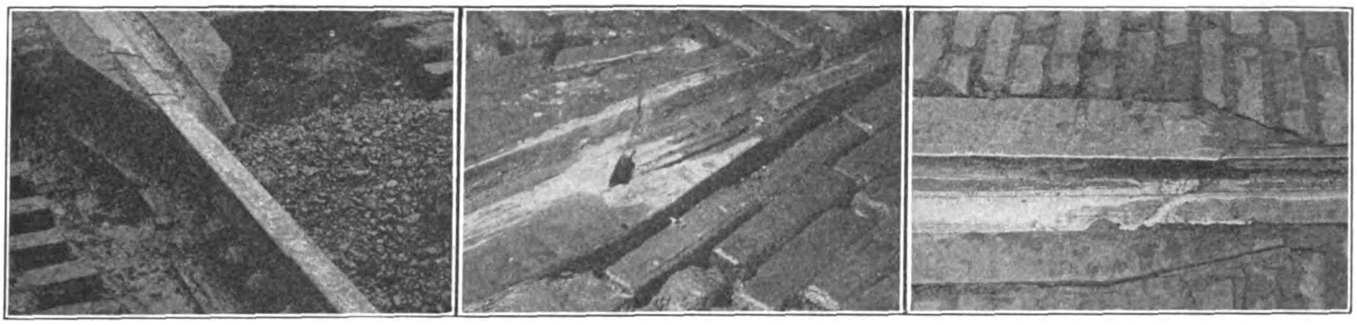
The latter has a lightweight wrought angle-iron framework braced with $\frac{3}{8}$-in. steel cable. It is 7 ft. square, and can be used at heights between 12 ft. and 18 ft. It is equipped with the usual maintenance equipment. To prevent tipping when the tower is in use the car is clamped firmly to the rails. The car has been in service for two years, and by economy in fuel and labor has saved $4,000 for the company.

Track Repairs Speeded Up by Use of Oxy-Acetylene Tools

The Puget Sound Traction, Light & Power Company has been speeding up its track repair work by means of gas-welding. The accompanying illustrations show the different steps in a recently completed job in which a Prest-O-lite welding and cutting outfit was used to cut out a broken section of rail and then build up the rail to give an even running surface. This job was done in about half the time which was formerly required to replace rails which had been broken.



TRACK REPAIR GANG WORKING AT NIGHT



THREE STEPS IN REPAIR OF RAIL—1, BROKEN SECTION BEFORE REPAIR—2, RAIL WITH BROKEN SECTION BURNED OUT—3, REPAIRED RAIL AFTER SEVERAL WEEKS OF SERVICE

The first of the three grouped pictures shows the broken section of rail on the near side of the switch mate, the switch mate itself not being broken. The second picture was taken after the broken section had been burned out, and the third picture of the group shows the section after it had been repaired and subjected to several weeks' wear.

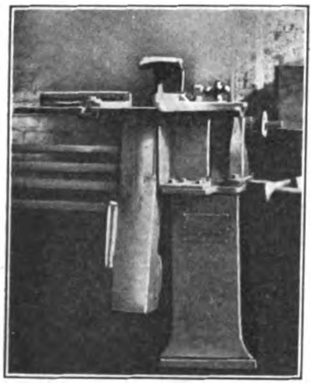
This work was all done between midnight and 3 a. m. on account of the heavy traffic which passes the point in the daytime. One of the accompanying illustrations shows the gang at work on the job.

Carbon Brushes Recut with Carborundum Wheel

Motor Brushes Made Into Compressor Brushes at Rate of 500 Per Day

BY E. R. PIKE
Assistant Superintendent Fifty-second Street Repair Shop
Brooklyn (N. Y.) Rapid Transit System

Worn motor brushes are cut into smaller sizes and are used for compressors in the Fifty-second Street shop of the Brooklyn Rapid Transit Company. This is done by means of a carborundum wheel 12 in. in diameter and 3/32 in. thick, which is mounted as shown in the illustration and driven by a belt at a speed of 1860 r.p.m. A circular hood connected with a suction blower is mounted over the wheel to remove the fine dust, while heavier carbon particles drop through an opening in the table into a receptacle from which they are removed from the bottom. The guides on the table are adjustable so that any sized brush can be cut.



MACHINE FOR CUTTING CARBON BRUSHES

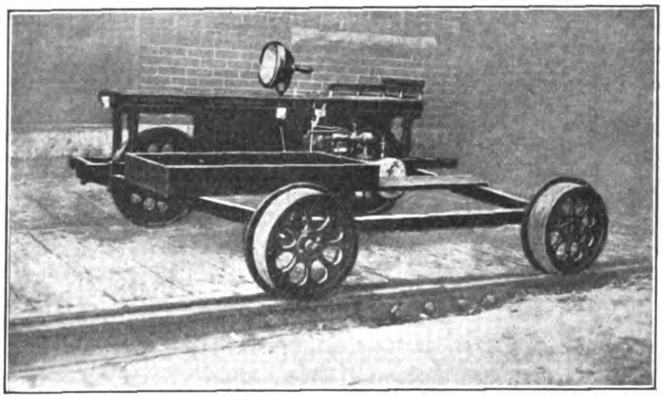
The motor brushes are of different lengths and widths but are all ½ in. in thickness. These are sawed into brushes ⅜ in. thick. Three or four cuts are necessary for each brush, one to shave it down to the proper thickness, and other longitudinal and transverse cuts, depending upon how badly the brush is worn. Recutting brushes without reducing the thickness was tried out but was found to be unsatisfactory, as many of the brushes were worn to such an extent on the flat side that recut brushes of a uniform size could not be obtained without reducing the thickness to ⅜ in.

As the recut brushes are used for the car air compressors no new brushes for these machines have been necessary in several years so that considerable economy has been effected. About 500 brushes can be cut in a nine-hour day.

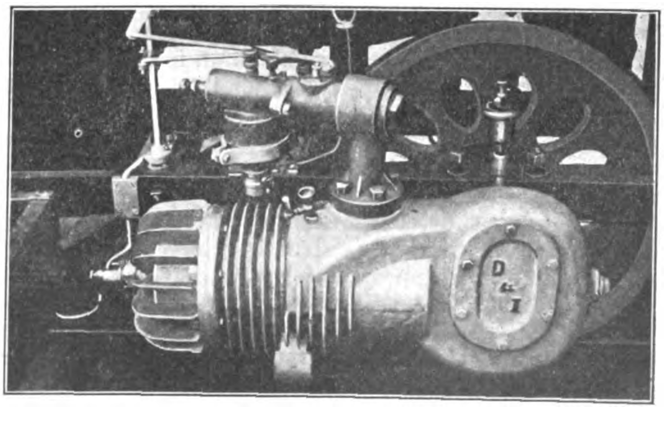
Gasoline-Propelled Inspection Car Gives Good Service

The Denver & Interurban Railway, Denver, Col., has constructed in its shops the gasoline-propelled inspection car shown in the accompanying illustration. The car has been driven 35,000 miles, and the only repairs necessary have been three sets of tires and two sets of engine bearings. It has given such excellent service that three more cars of the same design have been constructed. The cost of the car was $125.

It is of rugged construction and will carry three men and their tools up a 4 or 5-per cent grade without difficulty. The car is equipped with an incandescent headlight, the current for which is supplied by storage batteries. When not working at night the batteries are easily removed. The total weight of the car is 350 lb., and the single cylinder two-cycle engine which drives it weighs 75 lb. This engine was designed and built in the company's shops and is shown in one of the pictures, which also illustrates the method of attaching the engine to the truck frame.



GASOLINE-PROPELLED INSPECTION CAR, DENVER, COL.



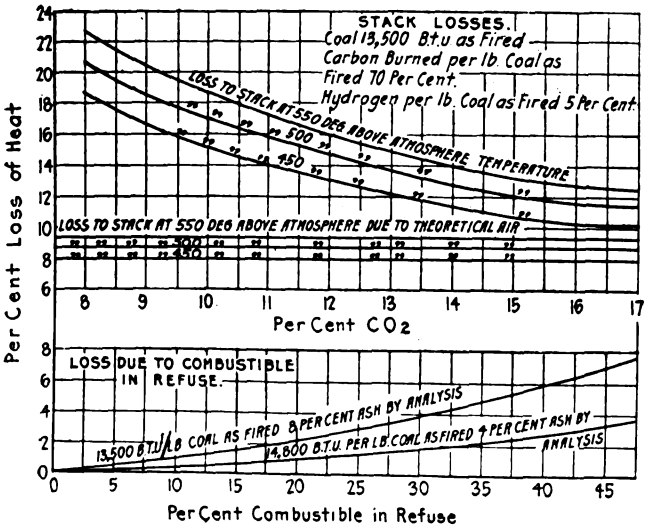
ENGINE OF INSPECTION CAR SHOWING METHOD OF MOUNTING ON FRAME OF TRUCK

Heat Losses in Steam Plants*

Boiler Economy Effected by Control of Excess Air and Combustible in Refuse

BY H. F. LAWRENCE
Test Engineer American Engineering Company, Philadelphia, Pa.

In steam generating plant operation the heat losses due to excess air are the most important of any of the heat losses that can be controlled to any extent. The upper set of curves in the accompanying illustration shows the percentage of heat or percentage of coal which is lost through the stack for different temperatures of excess gases and percentages of CO_2. The straight lines labeled "Loss to stack at 450 deg., 500 deg. and 600 deg. above atmosphere due to theoretical air" show the percentage of coal required for heating the furnace gases from atmospheric temperature up to the stack temperature. With no excess air, and perfect combustion these lines represent the heat lost through the stack for various temperatures. With different amounts of excess air indicated by various percentages of CO_2 the total heat loss through the stack is as shown by the upper curves. The differences between the lower curves and the upper curves is the excess air loss.



CURVES SHOWING BOILER HEAT LOSSES

It should be remembered in the interpretation of these curves that 16 per cent CO_2 represents 12.4 per cent excess air, 14 per cent CO_2 represents 39 per cent excess air, 10 per cent CO_2 represents 87 per cent excess air, and 8 per cent CO_2 represents 123 per cent excess air. When the CO_2 is reduced from 16 per cent to 10 per cent, the heat loss is increased by approximately 6 per cent of the coal burned, provided, of course, that the exit temperature remains the same. The volume of gases is much greater with 10 per cent CO_2 than with 16 per cent, owing to the greater amount of excess air, and the temperature of combustion is lower; therefore the heat absorbed by the boiler is less, so that the final temperature is higher and the heat loss due to excess air is greater than is really shown by the curves. A difference of 100 deg. in the exit temperature represents a loss of about 2½ per cent.

The lower set of curves shows the losses due to the combustible in the refuse. This loss in coal containing 4 per cent ash is approximately only one-half the loss due to combustible in the refuse of the coal burning 8 per cent ash. The curves show it is more important to burn out the carbon in a high-ash coal than a low-ash coal. While this is simple, there is a point beyond which it is not advisable to burn the combustible in the refuse, as large volumes of air are required to burn out the coke to a minimum, and the loss due to excess air greatly exceeds that which would have occurred had the combustible been dumped with the ash. The best plan of operation is to find this point by test or gas analysis and then operate accordingly.

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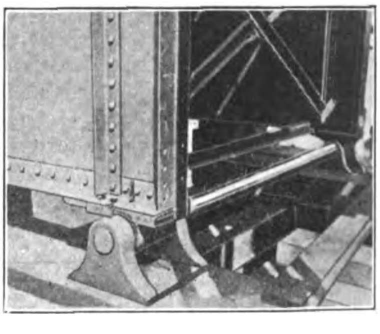
[*] Abstract of a paper delivered at a recent meeting of station and operating committee of the Ohio Electric Light Association.

Railroad Constructs Temporary Drawbridge at Seattle, Wash.

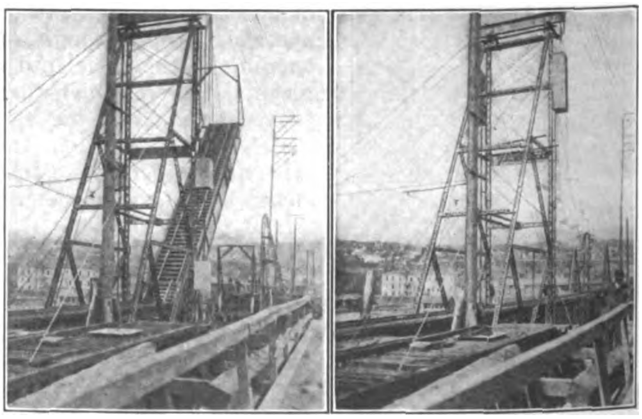
The accompanying illustrations show a jack-knife draw span bridge constructed by the Puget Sound Traction, Light & Power Company over Lake Union, Seattle, Wash. The bridge was necessitated by the delay in the construction of the new bascule span which is now in the course of erection. The railway has operated cars over a double-track trestle at this point for many years, but with the opening of the government canal leading to Lake Washington it became necessary to provide a waterway for vessels.



HINGE OF TEMPORARY DRAWBRIDGE

The temporary drawbridge is made of second-hand material and was built under the direction of the Stone & Webster Engineering Corporation. The span is composed of 90-ft. deck plate girders, 6 ft. in depth. The tower is 72-ft. high and over it pass two cables attached to the girders at approximately one-third the span. These cables run to the electric hoist housed in a building about 30 ft. back from the tower. The weight of the draw span is 30 tons and this is counterbalanced by four concrete weights, totalling 4000 lb. The weights are suspended in pairs, one above the other and work in relays. On starting to raise the span both weights are available and when the span has reached an angle of 22½ deg. with the horizontal the counterweight is diminished.

At the approach adjacent to the hinged end of the draw span there is a 7-ft. section of track which is also hinged so that it can be raised before the span itself is started. This permits the span to tip up without damaging the approach. The span itself is carried on two piers of 50-ft. and 55-ft. piles. These penetrate the bottom of the lake only 6½ ft. on account of the hardness of the soil.

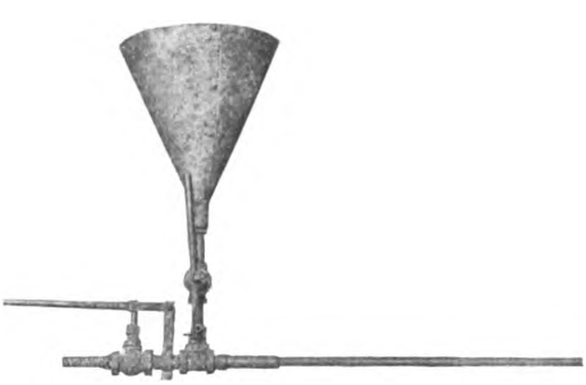


TEMPORARY DRAWBRIDGE, SEATTLE, WASH., IN OPERATING POSITION AND WITH DRAW SPAN RAISED

Condenser Pipes Cleaned by Sand Blast

BY J. C. FALKNER
Chief Operating Engineer Richmond Light & Railroad Company, New Brighton, N. Y.

Cleaning condenser tubes is accomplished in this company's power house by means of the air-operated sand-blasting outfit shown in the illustration. The long pipe on the right is pushed into the condenser, and is slightly tapered so as to fit the condenser tube easily. The short section of pipe on the left is connected to the air supply and is provided with a lift gate valve. The sand is held in the large funnel, the flow being controlled by a gate valve. The top of the funnel is covered with cloth to prevent the sand being blown out and into the faces of the operators, in case both valves should be opened at once. Two men operate the device, one guiding it and the other operating the valves.



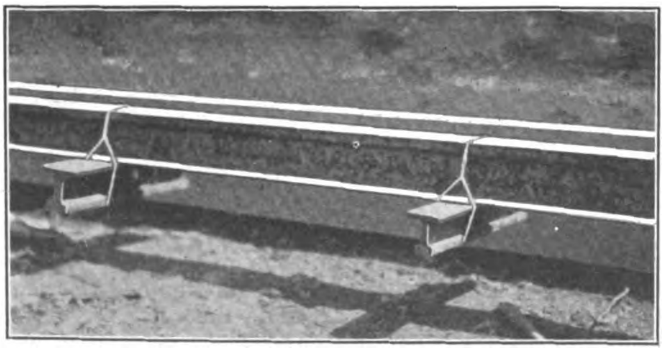
SIMPLE SAND-BLASTING OUTFIT USED FOR CLEANING CONDENSER TUBES

As reported in the issue of the ELECTRIC RAILWAY JOURNAL for May 19, 1917, page 914, the National Electric Light Association gave sand blasting as an effective method of cleaning condenser pipes. However, as this report mentioned only the use of a high-pressure water jet for driving the sand, I thought that a description of the air sand-blasting method used by us would be of interest.

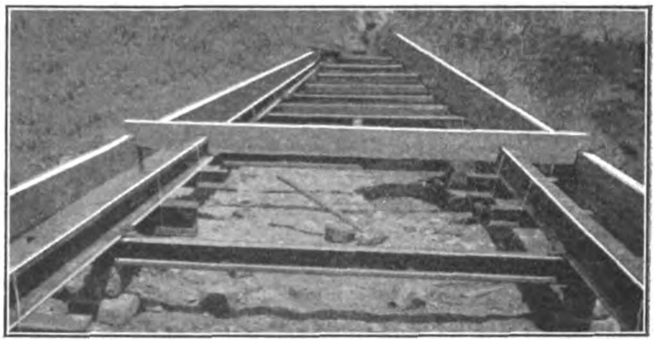
Worn-out Rail Used as Steel Ties in Concrete Foundation

The Southern Traction Company at Sherman, Tex., is using a lot of its worn-out 30-lb. and 40-lb. rail as steel ties and rail bases in its new track construction, which is laid in a concrete foundation.

Long sections of the old rail are spaced every 9 ft. and serve as ties. They are placed with the bases up, as shown in one of the accompanying illustrations, and are fastened to the track rail by bolts passing through the base of the old rail and clamping onto the base of the new track rail. Spaced equally between the long ties are two 18-in. lengths of rail. These are also placed with the bases up, and are wired to the base of the track rail. After the concrete is poured the wires are cut. Two short sections opposite each other make virtually as good a foundation as a complete tie.



USING UP OLD RAIL AS STEEL TIES, SHERMAN, TEX.



SHORT TIES MADE OF 18-IN. LENGTHS OF OLD RAIL AND SPACED EVERY 3 FT. BETWEEN LONG TIES

By this type of construction the company has avoided the cost of wooden ties and has used up a lot of worn-out rail for which there was no other use. The illustrations show the work being done on a section 2200 ft. long, and this type of construction is being contemplated for future track work.

Special Tie Plate Holds Rail to Gage and Alignment in Addition to Supporting It

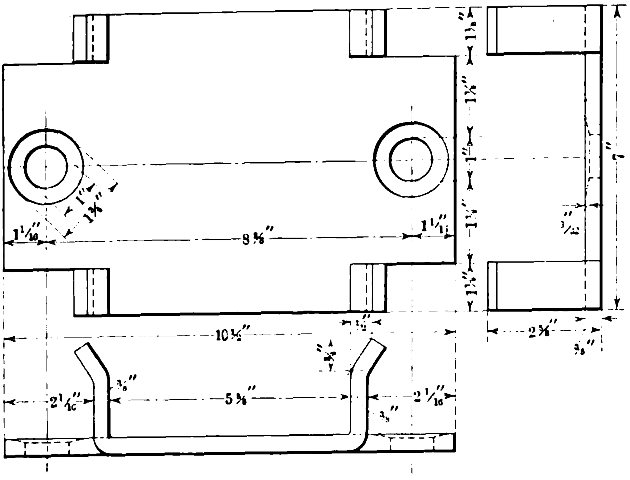
The Vaughn rail support, pictured herewith, is a device manufactured by the St. Louis Frog & Switch Company for serving at once as a tie plate and as a means of holding the rail to gage and alignment. It is made of open-hearth steel of special quality with a usual width of 7 in., thickness of 3/8 in., and length dependent on the size of rail base with which it is used.

The support is usually applied to wooden ties by means of two screw spikes, the ties having previously been bored to proper gage by mechanical means in the materials yard. In the field, therefore, it is necessary simply to screw in the spike. Another way of using the tie plates is to bore the ties and fasten the plates to them in the materials yard before sending them to the job. It is then claimed that the rail can be securely applied at less expense than spiking, by the cheapest class of labor, with the assurance to the engineer that his track will be properly gaged and supported. The bending over of the lips or projections on the plate firmly ties the rail base to the plate, so that this support not only holds the rail to gage, but also prevents creeping or rolling of the rail under traffic.

TIE PLATE BEFORE AND AFTER CLAMPING TO RAIL

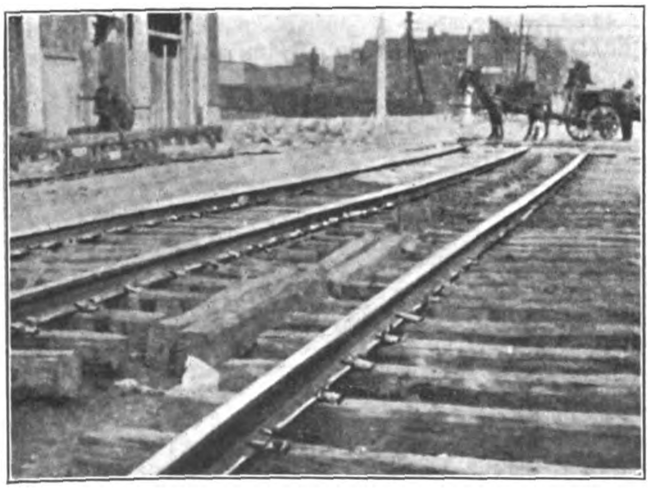
The Vaughn support has not been extensively used by the steam railroads, because it has been impossible to compete in price with the ordinary tie plate, but 500,000 have been manufactured for various electric railroads, principal among which is the United Railways of St.

Louis, Mo., which has installed several hundred thousand in the last five years. In 1912 this company used the Vaughn plate in laying about 2½ miles of 7-in., 103-lb. Lorain steel section No. 426 rail on oak ties, spaced 2-ft. centers, and about 5 miles of track with 100-lb. A. R. A. T-rail with oak ties, 2-ft. centers. Since the year 1912, the St. Louis company has laid approximately 30 miles of track with 100-lb. T-rail on oak ties and used these tie plates. C. L. Hawkins, engineer maintenance of way, reports that sections of this track have been opened up at a number of locations, but that no instance has been found where a tie plate had become loosened, or where there was any excessive vibration when the cars passed over the track.



DETAILS OF SPECIAL TIE PLATE

In the St. Louis construction the tie plates are fastened down with standard ⅞-in. x 6-in. screw spikes and the prongs hammered down over the rail base with a sledgehammer and afterwards flattened by a special tool. Little trouble has been experienced with the prongs breaking off when hammered down. A very low carbon steel, ranging from .10 to .20 carbon content is used in the manufacture of the plate and when properly cooled after forging, the steel bends without cracking. The tie plates cannot be taken out of the track and used over again, since the prongs will not stand the extra bending.

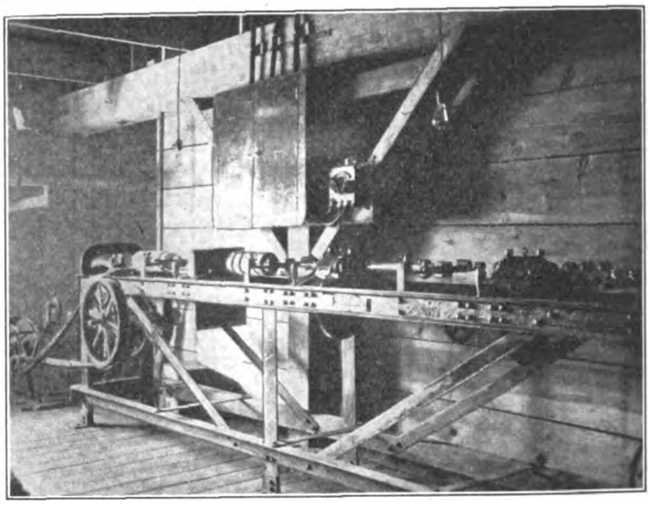


SPECIAL TIE PLATES IN ST. LOUIS TRACK

The above illustration shows an installation of these tie plates on a section of track under construction in St. Louis, Mo. In this case they were used with hewn ties.

Reinsulating Wire at Less Than One Cent Per Pound

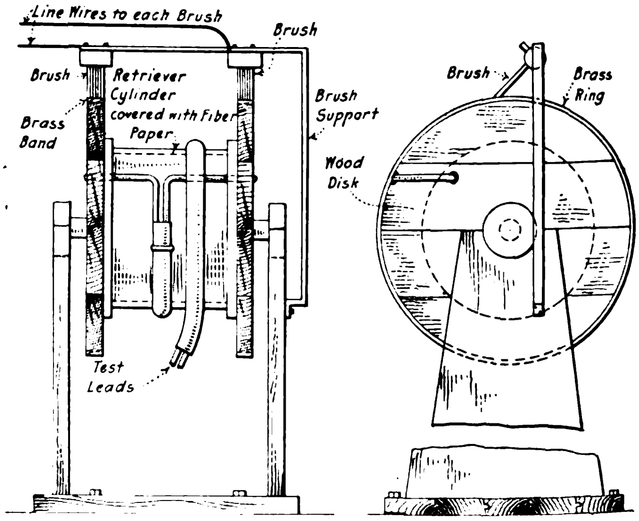
Shown in the accompanying illustration is a machine which is being used by the Washington Water Power Company, Spokane, Wash., for reinsulating wire. Since the purchase of this machine it is no longer necessary for this company to scrap any of its wire or other conductors on account of worn-out insulation. The machine straightens the wire and then winds it with a flat eighteen-strand cotton string. Before the advance in prices the company reinsulated its wire at a cost of less than 1 cent per pound and the original cost of the machine, approximately $500, was saved during the first year of its service.



MACHINE FOR REINSULATING WIRE

Old Trolley Retriever Used to Coil Up Test Leads

In testing motors and other electrical equipment in the shops the current is often taken from the switchboard by leads several feet in length. The Knoxville Railway & Light Company, Knoxville, Tenn., uses an old trolley retriever to keep such leads off the floor. Flexible leads are used and the current is supplied to them through two slip rings attached to the retriever. The leads reach 10 ft. when unwound, and when not in use the retriever promptly coils them on its drum.



OLD TROLLEY RETRIEVER MOUNTED TO COIL UP TEST LEADS

News of Electric Railways

Traffic and Transportation

Financial and Corporate | Personal Mention | Construction News

Chicago Men Reject Increase

President Busby of the Surface Lines, in Answer to Union Demands, Grants Two-Cent Wage Increase but Refuses Eight-Hour Day Basis—Negotiations to Continue

In a letter dated June 2 to William Quinlan, president of Division 241 of the Amalgamated Association of Street & Electric Railway Employees of America, Leonard A. Busby, president of the Chicago Surface Lines, made answer to the demands of the union which were given in detail in the ELECTRIC RAILWAY JOURNAL of May 12, page 887. These demands included two principal questions, the first being the substitution of an eight-hour day for the present ten-hour day, and the second, a wage increase to a maximum of 50 cents an hour, intended to cover the shorter working hours and the increased living costs. In answer to the first, President Busby's letter reads as follows:

MR. BUSBY'S ANSWER

"The average over-all time of our scheduled runs is now barely ten hours, and of this at least one hour is bonus time —that is, time for meals, and time for preparing for and closing the day's work—so that the actual time in operation of cars is nine hours or less, for which ten hours' time is paid. Our present working hours—an average day of ten hours, with a minimum of nine hours and a maximum of eleven hours—were fixed by mutual agreement in 1912 and again in 1915. There is no apparent reason at this time for the reduction of these hours, while on the other hand there is every reason why these hours should be maintained. We are engaged in raising an army of 2,000,000 men. A few days ago in this city at a public meeting the labor representatives of Great Britain stated that for every soldier at the front at least five additional men were required to supply him with arms, ammunition, food and clothing. An army of 2,000,000 men in the field means that upward of 10,000,000 others will be taken away from their actual work and employed in carrying on the war. The reduction of our working hours at a time when the country is mobilizing its full man power for the great conflict is, in our opinion, unwise and wholly unwarranted."

In taking up the matter of wage increase reference was made to the unprecedented wage increase which was granted to the trainmen in 1915. This was far in advance of later wage increases in other industries, brought out during the past year by war conditions. The present wages were shown to be higher than those paid to street railway employees in ten of the principal cities of the nation. The single exception to this is Detroit, where, owing to the concentration of the automobile industries, an unusual labor condition exists. On account of this the Detroit United Railway is unable to get enough men to handle its cars. President Busby said that the maximum wage of 40 cents an hour which has just been fixed in Detroit is by no means as advantageous to the employees from an earning standpoint, taking into account the working conditions and allowances for bonus time, as are the conditions under the present wage scale and contract in Chicago. Mr. Busby also called attention to the high rentals in Detroit and to the materially higher general living costs which prevail in Detroit as compared with Chicago. He said that owing to the combination of interurban rates of fare with city rates, the Detroit United Railway receives an average fare per passenger more than 15 per cent higher than the average fare in Chicago. Mr. Busby said further:

"The remedy in this situation is not in continuing to increase wages to meet inflated prices in food commodities, but in inducing the government to exercise its unquestioned power properly to administer food supplies to prevent speculation and abnormal profit taking. There is now and will continue to be plenty of food in this country for all. There is no warrant for our present food prices. They must and will be reduced. Public opinion is being aroused, and since you presented your contract two weeks ago there has been a marked decrease in prices. We have undoubtedly seen the worst of this situation, and should look forward with confidence to a decline of the present prices to some reasonable basis under governmental direction. Were we to attempt to meet this situation by constant wage increases, which frankly we cannot do, the relief for you would only be temporary, and for this company and all other companies similarly situated the result would be bankruptcy.

"On the other hand, with a fixed rate of fare, the company is obliged to meet a heavy increase in operating expenses due to the increased cost of operating material and supplies. This increase on some articles ranged from 100 per cent to more than 200 per cent during the last eighteen months. The total increase in operating expenses, due to increasing costs of material alone, will be approximately $500,000 and contract prices for next year are still higher.

"Last year, the best in our history, we had an increase of nearly 10 per cent in gross. Our operating material and supplies were purchased in advance at normal prices. We had a favorable year and earned 6½ per cent on our certified capital. This year the increase in our gross is less than half that of last year, and with the increased operating expenses mentioned, our net earnings are materially less than those of last year. These are facts which you can readily verify.

NOTHING TO WARRANT WAGE INCREASE

"There is nothing, therefore, in the present situation, from the standpoint of the company, to warrant a wage increase. We have, however, endeavored to meet a difficult situation in a spirit of utmost fairness, and have decided to offer the men in the train service an increase of 2 cents an hour, applied uniformly to each grade in the present scale. A similar increase is offered to employees in the mechanical departments working about shops and car stations, as shown by the following scales:

WAGE SCALES

Class	Present Rate per Hour	New Rate per Hour
Trainmen—Passenger Service:		
First three months	27 cents	29 cents
Second three months	29 cents	31 cents
Second six months	30 cents	32 cents
Second year	32 cents	34 cents
Third year	33 cents	35 cents
Fourth year	34 cents	36 cents
Fifth year	36 cents	38 cents
Motormen on sprinkler and supply cars	32 cents	34 cents
Trolley boys on sprinkler and supply cars	23 cents	25 cents
Snowplows and sweepers	36 cents	38 cents
Night cars	$3 for 8 hours or less	$3.20 for 8 hours or less
Car repairers, motor repairers, inspectors, dopers and body repairers:		
First year	$2.40 a day	$2.60 a day
Second year	$2.70 a day	$2.90 a day
Third year	$3.00 a day	$3.20 a day
Car placers:		
First year	$2.40 a day	$2.60 a day
Second year	$2.75 a day	$2.95 a day
Car cleaners, switchmen, terminal men, etc.:		
First year	$2.10 a day	$2.30 a day
Second year	$2.40 a day	$2.60 a day
Mechanics in west shops	2 cents an hour increase	

"This wage increase on the basis of the present hours will, when effective, show the following results to our trainmen:

"Regular trainmen, more than 7000 in number, will receive an average wage in excess of $1,150 a year. Extra trainmen, more than 2000 in number, will receive an average wage in excess of $950 a year. All trainmen, including regulars and extras, will receive an average wage in excess of $1,000 a year. These men average ten hours a day paid time and not to exceed twenty-six days a month.

"We submit that this showing is not equaled by the earnings of street railway trainmen in any other large city in the United States. It would naturally be expected that such a wage scale would cause the train service to be regarded as a highly desirable employment, and such is the fact, even under present conditions. The number of applicants for positions in our train service is at present far in excess of our requirements.

"In this connection we desire to call your attention to the fact that the proposed wage increase, together with the increased cost of operating material and supplies, will impose a burden of more than $1,250,000 a year upon the companies."

Mr. Busby's letter further states that any and all questions which either party may desire to submit to arbitration, provided this agreement is not accepted, will be arbitrated by the method provided under the present contract. The new contract submitted for the approval of the men is unchanged except for the wage scale. It will take effect as of June 1, 1917, and will run for a period of three years.

At a meeting on June 5 the union voted to reject Mr. Busby's offer and directed its committee to continue negotiations, but with instructions that nothing less than the original demands would be satisfactory to the union.

Washington Strike Inquiry

A Few of the Important Points Are Touched Upon That Have Been Covered by Recent Witnesses Before the Investigating Committee

William F. Ham, vice-president of the Washington Railway & Electric Company, Washington, D. C., was a witness on May 23 before the committee of the Senate which is inquiring into the recent strike of the employees of the company. Mr. Ham said that in the absence of anti-strike legislation or compulsory arbitration the company considered the individual contract the best preventive of strikes. He again made clear the distinction constantly drawn by the officials of the company between refusal to deal with committees of the Amalgamated Association and willingness to treat with committees of the employees. He reviewed some of the strike history of New York last fall and cited the breaking of contracts there by the Amalgamated Association as indicative of the irresponsibility of that organization.

COLLECTIVE BARGAINING DISCUSSED

Senator Pittman, chairman of the investigating committee, cross-examined Mr. Ham as to the attitude of the company toward any collective bargaining with the men. Mr. Ham protested against Senator Pittman's interpretation that when the letter of President King of the company was sent to the men on Feb. 27 the company had no idea of dealing with the men collectively. Mr. Ham said that if the men had advanced some proposition eliminating the union it might have been adopted. The only assurance that the company had received from the District Commissioners, who sought to bring the men and the company together, was that the men would accept a contract similar to that entered into with the Capital Traction Company. Mr. Ham also went at length into the workings of the relief association of the company.

At a subsequent hearing the committee inquired into the history of the drafting of the individual contract offered by the company. Among those who testified were S. R. Bowen, secretary of the company, and J. S. Barbour, its general counsel. Mr. Bowen said that his attention had been called to the individual contract by President King in the summer of 1916. He looked into the matter and passed a draft of it to Mr. Barbour. Mr. Barbour said that he had gone over the draft as presented to him by Mr. Bowen; that he had offered suggestions for changes, and that from that time on he had not seen the contract or discussed it with any of the officers of the company until it was presented to the men. Another feature taken up at this session was the question of representation of the public on the board of directors of the company. Mr. Barbour thought that the interests of the public were well cared for by the Public Utilities Commission.

Mr. Bowen was again a witness on May 26. He said that he could not advocate collective bargaining which recognized the right of the men to strike in a body. He considered that employees of a public utility had no more right to strike in a body than had government employees.

At the hearing on May 29, at which President King was a witness, Senator Pittman, chairman of the investigating committee, said that it seemed to him that the company was contending that it was willing to enter into a collective agreement with the men if the union could be eliminated and at the same time knew that the union dominated the situation and could not be eliminated. George P. Hoover, counsel for the company, insisted that Senator Pittman was drawing a wrong conclusion from the testimony. Mr. Hoover contended that the company had been ready to go forward in good faith under the agreement of 1916; that the union had violated the agreement in issuing the pamphlet in which it stated that the company had entered into an agreement with the union, when it had not done so, and that the union had attempted to force non-union men into the union. He insisted that there had been no deviation in the policy of the company.

PRESIDENT KING FAVORS STRIKE PREVENTION LEGISLATION

President King was a witness again on May 31. He was in hearty accord with the sentiment of Senator Pittman that it seemed desirable for Congress to take up the question of legislation calculated to prevent strikes in the future in the District. Mr. Vahey for the union read into the record the individual contract of the Indianapolis Traction & Terminal Company with its men. Mr. King admitted that it was substantially the same as that of the Washington Railway & Electric Company. He said that he knew about the Indianapolis situation and told Mr. Bowen, secretary of the company, to inquire into the matter.

There was no session of the committee on June 4. On June 5 Mr. Ham went into the matter of the re-employment of a motorman who had been in an accident, and employees of the company who had long been in its service reviewed the conditions under which they have worked.

Chicago Traction Bills Passed

Four Bills Before State Legislature Passed by the Senate and Now Before the House

The thirty-year franchise bill for Chicago, the bill permitting the merger of the surface and elevated lines, the home-rule bill and the bill giving the city the right to construct subways have all passed to the third reading in the State Senate. There was little discussion of these bills at the third reading either by the supporters or by the opposition, and in no case was the necessary vote of twenty-six registered in favor of the bills.

The test vote permitting the merger of the surface and elevated lines went through the third reading by a vote of twenty-four to four. A similar test vote during the consideration of the home-rule bill resulted in its approval by a vote of twenty-four to seven. This measure had previously been amended to apply to the transportation interests in Chicago only and thus leave the other utilities under State control.

Former Governor Dunne and a delegation from Chicago who were opposing the traction plans were questioned by Walter L. Fisher, special counsel for the Chicago local transportation committee. Mr. Fisher argued in favor of the bills as offering the most promising immediate solution of the Chicago traction congestion. Mr. Dunne charged that the purchase price of $70,000,000 fixed for the elevated roads by the Traction & Subway Commission was excessive by at least $7,000,000, on which amount the city would be required to guarantee 6 per cent interest under the consolidation plan.

All four Chicago traction bills were passed by the State Senate on June 6. The vote on the measures was as follows: Home rule, twenty-eight to six; franchise, twenty-seven to fourteen; merger, twenty-six to eleven; subway, forty to five. It was intended to report the bills to the House on the morning of June 7. If the measures are passed by the House negotiations will be resumed with the City Council. Considerable time will probably elapse before a final ordinance is agreed upon. The ordinance so drafted must then go to a referendum vote.

Bids Asked for Cascade Electrification

The electrification department of the Chicago, Milwaukee & St. Paul Railway at Seattle, Wash., recently sent out specifications for the electrical equipment, including locomotives, generators, etc., to be used in the electrification of the Cascade Mountain division, from Cle Elum west to Seattle and Tacoma. It is expected bids for this equipment will be in by July 1. In calling for bids the company specified that delivery must be made as early as possible, in order that the division may be completed and in operation by Oct. 1, 1918.

Seattle Bridge Conference Results

Some Recent Matters Up for Settlement Between Street Railway and City Reviewed Briefly

The City Council of Seattle, Wash., is considering an ordinance introduced by Councilman Oliver T. Erickson, fixing the rental to be charged the Puget Sound Traction, Light & Power Company for the use of bridges across Lake Washington Canal, at Fremont Avenue, Fifteenth Avenue, N. W., Tenth Avenue N. E., and across the West Waterway at West Spokane Street. The bill tentatively fixes the rental for the use of the Fremont Avenue bridge at $804 a month, plus the cost of current used for the operation of cars over the bridge at the rate of 1 cent a kilowatt-hour. A. H. Dimock, city engineer, and A. L. Valentine, superintendent of public utilities, in a recent report, recommended a rental of $7,586 a year, plus one-third of the cost of maintenance, or about $633 a month. Mr. Erickson's bill also provides that if another street railway or the city itself should use the bridge for street railway purposes a pro rata amount shall be paid by the new tenant of the bridge, based on the number of cars in service.

CITY ABANDONS FIGHT

The city's fight for common user rights on Third Avenue with the Puget Sound Traction, Light & Power Company was virtually abandoned with the submission to the Council of the report of the conference committee, headed by Councilman Erickson, and the reference of the recommendations of the conference committee to the franchise and city utilities committees. The report indicates that nothing was accomplished at the several conferences with the officials of the Puget Sound Traction, Light & Power Company. A. W. Leonard, president of the company, refused to consider any proposition that included common user rights for the city lines on Third Avenue. The recommendations made by the committee follow:

"The corporation counsel, after a careful study, is of the opinion that the city may tender a rental proposal for crossing the Fremont Bridge, but that it could not be enforced, notwithstanding the company has refused to pay any portion of the cost of the bridge. He suggests that two methods of procedure are open for consideration. One is to revoke the company's franchise for failure to comply with its provisions. The other is to formulate a demand for a fair lump sum proportion of the total cost and a monthly contribution for maintenance and operation based on the franchise, and to bring suit in the case of refusal. In order that the company may have a rental proposal to consider, an ordinance of that sort has been prepared for introduction.

"The revocation of the company's franchise has not been considered by your committee. Such action presents many angles. Although the company has refused to comply with nearly all of its obligations, revocation may not be the best method of proceeding. The matter of enforcing a lump sum contribution with monthly charges for maintenance and operation will be considered while the rental ordinance is pending.

"In the matter of securing running rights on Third Avenue, the corporation counsel advises that it may be done by condemnation. This method would be tedious and the terms to be secured are an unknown quantity. Furthermore, we have already secured such rights on Fourth Avenue and would therefore recommend that further negotiations with the company on this matter be dropped."

"Times" Tackles Toledo Traction

Paper Discusses Local Traction Muddle in Terms Uncomplimentary to City Officials

The Toledo (Ohio) *Times* continues to discuss the street railway situation in terms that are far from complimentary to the Street Railway Commission and Mayor Milroy. It urges that something can and should be done at once to settle the controversy and that the city cease to await the pleasure of the commission in making its report to the Mayor. The paper doubts the feasibility of the community plan which has been worked out by the commission and believes that a substantial business proposition of some kind should be presented to the city.

The commission has never made a report of its work to Mayor Milroy and has as yet fixed no time for giving him official information along this line. The *Times* considers this as discourtesy. It argues that both the Mayor and the people are entitled to official information as to what has been done and should not be forced to depend upon newspaper reports. Two members of the commission are, by the way, the heads of Toledo papers.

The *Times* says that excess fares are being collected through the suspension of the workmen's 3-cent hours. This means that $700 a day is being collected from workingmen and transferred to the company's treasury. Of this one-half goes to a fund for the purchase of cars and for improvements, while the other is absorbed in an increase in the wages of motormen and conductors. The *Times* estimates that this excess, since April 10, 1916, aggregates $287,700, or a return of 6 per cent on a capitalization of $4,250,000. The *Times* does not criticize the company, but it does argue that the business should be placed upon a substantial and permanent basis of some kind.

PAPER RAPS TOLEDO COMMISSION

In commenting recently on the Street Railway Commission and its work the *Times* published the following editorial:

"The hostile attitude exhibited by Johnson Thurston toward the Rail-Light is so utterly at variance with the attitude of his 'co-commissioners' that it is evident there is no longer harmony within the organization. The *Times* has suspected as much for some time.

"It is apparent now that the 'car commission' as constituted will never agree on an ordinance to be submitted to the people and, this being the real state of affairs, Mayor Milroy should promptly relieve it from further duty. Then, if he is still of the opinion he expressed just after his election, he should try again. If he has kept in close touch with the street car situation of Toledo he should know that conditions are even worse than they were when he first appointed the committee. The car riders are not getting any better service and they are paying more for it. What they want is improved service and lower fares. The Dotson ordinance provided both. It was defeated largely through the efforts of the men who, because they claimed to know how to draft a better ordinance, were called upon by the Mayor to do the work. They have been at it intermittently for seventy-nine weeks and have produced nothing. There is no visible evidence that they intend doing anything. Whether they have deadlocked with Henry or with one another is immaterial. They have been on the job quite long enough to prove that they are either inefficient or disloyal to the city.

"What are you going to do about it, Mr. Mayor?"

On the evening of May 28 the City Council adopted the resolution providing for an amendment to the city charter which will allow the issuance of bonds for the purchase of the street railway property. The plan contemplates an issue of $1,500,000 of bonds, from the proceeds of which a cash payment will be made. There will be another issue of similar amount which the company will be asked to accept. The amendment to the charter is to be voted on at the August primaries, while the question of issuing the bonds will be placed before the voters at the November election. In the meantime the city will be asked to furnish funds to provide for a valuation of the property.

Relief Opposed in Rhode Island

Thomas Walsh, chairman of the committee on railroads of the City Council of Providence, R. I., has announced that the committee will oppose any plan for the city to release the Rhode Island Company from any of its many financial obligations. His statement followed a meeting of the committee held on May 31. Mr. Walsh said:

"The committee has decided absolutely against any change in the financial conditions of the franchise of the Rhode Island Company. The decision is final. No report will be made to the City Council, for we have nothing to recommend."

The obligations from which the company asked to be excused call for the payment annually of approximately $200,000 into the city treasury. The records of the city auditor show the following payments for last year: franchise tax, 5 per cent of gross receipts, payable quarterly, $110,000 a year; annual payment for sixty years, of interest at 4½ per cent, on one-third of the cost of widening streets, $35,000 a year; maintaining parts of the streets between rails, $50,000 a year.

Storm Stops Interurban Service

In the recent tornado which swept southern Illinois and caused great ruin in Mattoon and Charleston, the city lines in Mattoon and the interurban railway connecting Mattoon and Charleston, both owned by the Central Illinois Public Service Company, were more or less damaged. Service was restored on the city line within a few hours after the storm had passed since only a small amount of overhead construction was damaged. Trees blown across the tracks had to be removed.

On the interurban line, however, nearly 50 per cent of the pole lines which carried the overhead construction and a three-phase transmission line connecting Charleston and Mattoon was blown down. A car which was on the line happened to be in a cut during the worst of the storm and received practically no damage. Service was restored over a portion of the interurban line on June 1, and through service between Charleston and Mattoon was begun on June 3.

The power house at Mattoon escaped injury. The station at Charleston was rather badly damaged. The walls and roof collapsed and the stack was blown over, but practically no damage was done to the station equipment. Service was restored in this plant on June 1.

Commission to Govern City Utilities

Cincinnati Rapid Transit Commission Seeks Jurisdiction Over All Utilities in the City

At a meeting of the Rapid Transit Commission of Cincinnati, Ohio, on June 1 a resolution was adopted requesting the New Charter Commission to include in the proposed city charter a provision clothing the Rapid Transit Commission with supervision of all public utilities. Chris Schott, who submitted the resolution, and E. H. Dornette were appointed as a committee to confer with City Solicitor Groom and Frederick S. Spiegel, counsel for the commission, as to the legality of such a provision. Should there be no legal obstacles, the committee will appear before the Charter Commission to recommend its adoption. While the Cincinnati Southern Railroad, which is owned by the city, is not mentioned in the resolution, it is understood that it will be included with other utilities as coming under the supervision of the commission, should the Charter Commission adopt the plan.

Chairman E. W. Edwards of the Rapid Transit Commission and Chris Schott constitute a committee which will urge delay in granting the Cincinnati, Newport & Covington Street Railway a franchise until it can be determined whether the proposed tracks on Walnut Street south of Third Street will interfere with the construction of the loop tracks.

Frank S. Krug, chief engineer of the commission, reports that he has a force of men making measurements of foundations of buildings on Walnut Street along the proposed subway route.

Arbitration in East St. Louis

This Method Adopted After Conferences Between Company Officials and Men Fail

A conference of the Mayors of several East Side cities, called by Mayor Mollman of East St. Louis for June 1, averted the threatened strike of 600 motormen and conductors of the East St. Louis & Suburban Railway, the employees of which had voted to walk out at 5 a. m. on June 2. The conference was held in the City Council Chamber, East St. Louis. It was attended by the officials of the railway, representatives of the car men's union, the Mayors of Alton, Edwardsville, Collinsville, Belleville and other East Side towns touched by the system. Both sides agreed to arbitrate the differences. Each side is bound to accept the finding of the committee. The committee is composed of Al Towers, representative of labor in Belleville, Ill., for the employees, and C. E. Smith, a civil engineer of St. Louis, for the officials. It was expected that a third arbitrator would be selected later.

The motormen and conductors wanted the flat rate system continued. This method of payment has been in effect since the lines of the East St. Louis & Suburban Railway were built. The officials of the company wanted to put a sliding scale into effect by which new men would receive less than veteran employees. The company contended that a man who had worked for years knew his run and his passengers and was worth more than a new man. The employees argued that if the old timers were paid the top wages they would be the first to go in case of a desire on the part of the company to reduce expenses. The question of wages is practically the only one for the committee to decide. At present all conductors and motormen on the local lines are paid 27 cents an hour and work between nine and ten hours. The men working on the interurban lines are paid 28 cents an hour. The local men are asking for 38 cents an hour and the interurban men for 48 cents an hour.

At the conference on June 1 Mayor Mollman of East St. Louis told the railway officials that the men were decidedly opposed to a sliding wage scale. He pleaded with the company because of the general industrial unrest on the East Side, not to delay a peaceful settlement by insisting on a sliding scale. After consultation the officials announced they would eliminate this feature from consideration. The representatives of the railway and of the motormen and conductors have been conferring for several weeks. A two-year working agreement between the company and car men expired on May 1. Heretofore this has been renewed within ten days.

C. E. Smith, selected by the officials of the railway as their representative on an arbitration committee, and Al Towers, chosen by the employees of the road to look after their interests, are holding daily conferences in an effort to settle the differences between the railroad officials and the employees. Up to June 7 the third member of the committee had not yet been named and no third party will be named if the differences can be adjusted without one. Thus far, however, there has been no indication of the possible outcome of the conferences between the two arbitrators. Meanwhile the operation of the railway line is being continued as usual.

Rapid Transit Progress in New York

The Interborough Rapid Transit Company contemplated the beginning of service on the West Farms connection between the Second and Third Avenue elevated lines and the West Farms branch of the first subway on June 1, but found it necessary to report to the Public Service Commission for the First District that this operation must be postponed for upward of a month. After an examination of the new line operating officials of the company informed the commission that they deemed it unwise to begin operation without a complete set of signals to govern the running of the Second Avenue express trains which in the morning and evening rush hours will use this connection.

The Public Service Commission for the First District recently directed that operation of a portion of the new Jerome Avenue elevated line in the Bronx should begin on June 2 at 2.30 p. m. The portion placed in service is part subway and part elevated railroad and extends from 149th Street and Mott Avenue north to Kingsbridge Road and Jerome Avenue. It is expected that the whole line will be placed in service in the fall in connection with the new Lexington Avenue subway, of which the Jerome Avenue branch is a part. The Lexington Avenue line forks in the vicinity of 135th Street and one branch extends to the eastward to Pelham Bay Park, while the other reaches north under Mott Avenue and other thoroughfares as a subway to 157th Street and thence extends as an elevated railroad over River and Jerome Avenues to Woodlawn Road and Van Cortlandt Park. It was arranged that regular passenger service should be begun immediately, passengers obtaining access to the line by way of the Mott Avenue station of the first subway, which is adjacent to the 149th Street station of the Jerome Avenue line.

Subway travel from the Pennsylvania Station to Times Square is possible now. A completed spur on the new Seventh Avenue line between those points was opened to the public on June 4. By use of the new spur the Grand Central Terminal and the Pennsylvania are brought nearer together, as passengers on one fare with little inconvenience can go from or to the old subway at the Times Square station, where a transfer station has been established.

The north headings of the new subway tunnel between Whitehall Street, Manhattan, and Montague Street, Brooklyn, were joined underneath the East River on June 2. The south headings will be "holed through" and joined within the next two or three weeks, according to reports made by engineers to the commission. This tunnel, which will eventually be operated as a part of the Broadway-Fourth Avenue subway system by the New York Consolidated Railroad, Brooklyn, has been under construction since 1914. A little less than a year more must elapse before the tunnel is completed and ready for operation. With the headings of the Whitehall-Montague Street tunnel joined, two of the four new rapid-transit tunnels under the East River being built as a part of the dual system of rapid transit will be well on the way to completion.

Conference Held in Philadelphia

The suggestion of Senator McNichol made at Harrisburg, Pa., on May 29 in regard to the pending transit bills for Philadelphia has been adopted. He recommended at that time that the representatives of the city and the Philadelphia Rapid Transit Company get together and confer further with respect to the differences between them. The first of these renewed conferences looking toward an agreement for the operation of the city-built high-speed lines was held on June 1. It was participated in by E. T. Stotesbury, Ellis Ames Ballard, and A. L. Drum for the company and Joseph Gaffney, chairman of the finance committee of the Councils; City Transit Director W. S. Twining and William Draper Lewis, the city's legal adviser, for the city. They engaged in what was said to be a "full, frank, free and friendly discussion" of the points at issue and the pending legislation. The result was announced to be "satisfactory progress for the city's interests."

Increase in Wages on Morristown Line.—The wages of all the employees of the Morris County Traction Company, Morristown, N. J., except the executive heads have been increased about 10 per cent.

Kansas Road to Purchase Power.—A contract has been closed by which the Union Traction Company, Coffeyville, Kan., will purchase energy from the Kansas Gas & Electric Company, which has power plants at Independence, Cherryvale and other points.

Increase in Wages in Davenport.—Employees of the Tri-City Railway, Davenport, Iowa, will soon receive an increase in wages of 1 cent an hour, effective on June 1. Under the new scale trainmen will receive 27 cents an hour the first year, 28 cents an hour the second year and 32 cents an hour the third year. For overtime the men receive the regular scale plus 7 cents an hour.

Seek a Voluntary Increase in Wages.—Officials of the local branch of the Amalgamated Association at Cleveland, Ohio, are preparing a table of price increases on foodstuffs since the contract of the men with the Cleveland Railway was signed in May, 1916, with the idea of showing the company why a voluntary increase in wages should be made. Under the contract the men received an increase of 1 cent an hour, beginning with May 1, this year.

Summer Engineering Courses at Wisconsin.—The nineteenth annual summer session of the College of Engineering of the University of Wisconsin will be held at Madison during the six weeks' period beginning June 25. Special courses will be given in chemistry and in electrical, steam and hydraulic engineering, gas engines, machine design, mechanical drawing, mechanics, shop work and surveying. All the courses are open to engineering students.

Electric Operation of Corvallis Line on July 1.—The work of completing the electrification of the 40 miles of line of the Southern Pacific Company between Whiteson and Corvallis, Ore., has been further delayed by inability of the manufacturers to deliver the electrical apparatus. According to J. H. Dyer, assistant general manager of the company, the line will be ready for electric service about July 1 unless some delay not now apparent should arise.

Preparing for Arbitration at Alliance.—Charles R. Morley, president of the Cleveland, Alliance & Mahoning Valley Railway and the Stark Electric Railway, has selected J. H. Alexander of the Cleveland (Ohio) Railway as arbitrator in the wage dispute which was one of the factors in the strike recently settled. The men demanded an increase of 5 cents an hour. President Morley offered an increase of 2 cents an hour to the men on the Cleveland, Alliance & Mahoning Valley Railway and 3 cents an hour on the Stark Electric Railway.

Increase in Wages in Phoenix.—Word was received at Phoenix, Ariz., on May 16, that the increase in wages of 5 cents an hour asked for by the employees of the Phoenix Railway has been granted by Gen. M. H. Sherman, president of the company, in Los Angeles, as a result of conferences with S. H. Mitchell, general manager. General Sherman is reported to have stated that while the resources of the company would not permit the increase, he would send his personal check to cover the increase for a period of three months, during which time it is hoped that a plan to make the advance permanent may be worked out.

Condemnation of Duluth Line Threatened.—Immediate steps for the condemnation of the Duluth (Minn.) Street Railway, under the exercise of the right of eminent domain, have been ordered by the Duluth City Commission. Frank Crasweller has been appointed a special attorney for the city to take whatever steps may be necessary to carry the commission's resolution into effect. The resolution provides for payment of "a fair price as a going concern." The action by the city in this connection is generally regarded as a counter move by the city in the so-called 10-cent fare case involving suburban lines, to which reference has been made previously in the ELECTRIC RAILWAY JOURNAL.

Rushing the Railroad Rate Hearing.—Testimony in the railroad rate hearing is proceeding before a special examiner, as well as before the full Interstate Commerce Committee, and the hearings on the petition of the railroads for a 15 per cent advance in freight rates are being rushed to allow all the parties to put in appearances before June 7, when the case against the carriers is to be closed. Next week representatives of shippers in diversified industries from several sections, as well as state railroad commissions, will present additional protests, and on Thursday and Friday the carriers will introduce testimony in rebuttal. Final arguments for all interests will be heard June 9, 11 and 12.

Further Seattle Bridge Conferences Probable.—As an alternative to a suit against the Puget Sound Traction, Light & Power Company, Seattle, Wash., the majority of the members of the City Council has agreed to a proposal that the company pay $1,000 a month for the use of the Fremont Avenue bridge. This included $804 a month as a rental equivalent to the company's share of construction and $196 for the cost of operation. It is possible that the new proposal will result in a renewal of conferences between the company, on one hand, and the Councilmen, Superintendent of Public Utilities A. L. Valentine, and Corporation Counsel Hugh M. Caldwell on the other. At the committee conferences Councilman R. H. Thomson alone dissented. He expressed doubt as to whether the company could in fairness be charged for the operation of the bridge.

Public Service Commission for Porto Rico.—Congress, by an act approved on March 2, 1917, provided for a public service commission in Porto Rico. A new Legislature and the public service commission for which provision has been made will be organized on Aug. 13, 1917. This public service commission will supersede the executive council and the committee on franchises and public service corporations in the granting of franchises, privileges and concessions, and will have jurisdiction over rates, rules and regulations, service and protection from competition. The public service commission will be formed by the following six heads of Porto Rican departments: Attorney general, treasurer, commissioner of the interior, commissioner of education, commissioner of health and commissioner of agriculture and labor, together with the auditor of Porto Rico, who under the law is not considered as a head of department, and two commissioners to be elected by the voters of Porto Rico, a total of nine. The commission will choose its own personnel.

Sixty-ninth Street Terminal, Philadelphia, to Be Improved.—Increased terminal facilities for West Philadelphia and a station almost twice the size of the present Sixty-ninth Street terminal are projected by the West Chester Traction Company and the Philadelphia Rapid Transit Company. A new station that will handle twice the number of persons, eight tracks for the West Chester Traction Company in place of the five now in use, expansion and extension of the Philadelphia Rapid Transit Company terminus and moving the West Chester turnpike 60 ft. to the south are some of the improvements contemplated to handle the increasing growth of traffic at the point where Delaware County adjoins the city. To increase the size of its terminal required the purchase of additional land to the south of West Chester turnpike. Some of the property holders demanded such a price for their land that the company was forced to begin condemnation proceedings. The Sixty-ninth Street station is one of the most important suburban electric railway terminals in the East.

Norfolk Franchise Conferences Resumed.—Several conferences have been held recently at Norfolk, Va., between representatives of the City Council and officers of the Virgina Railway & Power Company. The first of these was between officials of the company and members of the gas and electricity committee. Henry W. Anderson, counsel for the company, saw no hope for a readjustment of the light and power rates downward. He predicted an increase of $500,000 in operating costs to the company in Norfolk alone for the coming year. At a subsequent meeting with members of the franchise committee Mr. Anderson was asked to prepare a definite proposition that would embrace universal transfers, uniform paving obligations and a rerouting plan. The city, on the other hand, if members of the committee voiced the sentiments of the Council, would be willing to abandon its request for six tickets for a quarter, and would concede abolition of reduced fares. Partly to compensate for the expense of uniform transfers and the construction of new lines, regulation of jitneys was promised.

Program of Association Meeting

Central Electric Railway Accountants' Association

Under date of June 5 President O. A. Small of the Central Electric Railway Accountants' Association sent the following letter to members:

"After due consideration by the officers and executive committee the meeting scheduled to be held in Fort Wayne, Ind., on June 8 and 9 is hereby cancelled.

"In the cancelling of this meeting the officers and executive committee of the Central Electric Railway Accountants' Association do not intend that the organization will be of any less value to its members than it has been heretofore, but that the energy of the association will be devoted to the various problems which present conditions have presented before us."

Financial and Corporate

Annual Reports

Newport News & Hampton Railway, Gas & Electric Company

The income statement of the Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va., for the year ended Dec. 31, 1916, follows:

Railway revenue	$414,518
Gas revenue	142,779
Electric light and power revenue	253,891
Ice revenue	202.523
Total operating revenues	$1,013,711
Railway expenses	$229,824
Gas expenses	75.425
Electric light and power expenses	109.896
Ice expenses	143,397
Total operating expenses	$558.542
Net operating revenues	$455,169
Taxes	35.519
Operating income	$419,650
Non-operating income	3.273
Gross income	$422.923
Income deductions	234.491
Net income	$188,432

The total operating revenues of the company in 1916 showed an increase of $97,540 or 10.65 per cent over those of 1915, while the net operating revenues gained $63,503 or 16.21 per cent. The earnings in all departments showed increases because of good business conditions in the company's territory, owing to activity in shipbuilding and shipping. The revenues of the railway department increased $58,895 or 16.56 per cent in 1916, while the operating expenses rose $2,574. The gas revenues gained $9,860 or 7.42 per cent; the electric light and power revenues, $39,112 or 18.21 per cent, and ice revenues, $18,672 or 10.16 per cent.

The operating expenses of the combined departments rose $34,036 during the year, but the operating ratio fell from 57.25 per cent in 1915 to 55.09 per cent in 1916. The gross income gained $57,048 or 15.59 per cent, while income deductions decreased slightly on account of the retirement of bonds. As a result the net income showed a gain of $58,468 or 44.98 per cent. Of this $71,208 or 7.03 per cent of the gross revenues was credited to the reserve for depreciation, extraordinary renewals or purchase of bonds, as compared to $25,079 in 1915. The capital expenditures in 1916 were $151,671, of which $102,239 was for the railway.

North American Company

The comparative income statement of the North American Company, New York, N. Y., for the calendar years 1915 and 1916 follows:

	1916	1915
Interest received or accrued	$450.131	$488,804
Dividends received	1,824,278	1,438,028
Profits and compensation for services	29.920	28,671
Total	$2.304.329	$1,952,503
Salaries, legal expenses, net rentals and all other administrative expenses	$77.961	$77,780
Taxes	33,334	10,576
Interest paid or accrued	17,491	25.821
Sundry accounts written off and reserves	13,625	33,549
Total	$142,411	$147,726
Net income	$2,161,918	$1,804,777
Dividends paid and accrued during year	1,489.665	1,489,666
Balance carried to undivided profits account	$672,253	$315,111

The gross income of the North American Company from its holding of stocks and bonds of the various electric light and power and electric railway companies showed a good gain in 1916, and after providing for all expenses and interest charges, the company earned 7.25 per cent on its capital stock as compared with 6.05 per cent in 1915.

SIDE GUIDE & GRIPPER

Business conditions in the territories in which the company is interested showed a substantial improvement, but the subsidiaries had to bear increased expenses.

In the Wisconsin group the two companies of interest in the electric railway field are the Milwaukee Electric Railway & Light Company and the Milwaukee Light, Heat & Traction Company. The operating revenues of the Milwaukee Electric Railway & Light Company for 1916 amounted to $6,961,151, an increase of $989,436 or 16.57 per cent. The operating expenses, taxes and reserves increased $766,442 or 18.40 per cent, and interest charges decreased $34,176 or 4.31 per cent, so that the net income increased $305,021 or 29.25 per cent. The increase in operating revenues in the railway department was $700,455 or 17.91 per cent. Expenditures for construction during the year amounted to $1,005,631.

The operating revenues of the Milwaukee Light, Heat & Traction Company for 1916 amounted to $1,852,071, an increase of $371,446 or 25.09 per cent. Operating expenses, taxes and reserves increased $288,648 or 29.14 per cent, and the net income decreased $178,754 or 33.98 per cent. The increase in operating revenues in the railway department was $144,252 or 16.70 per cent. The expenditures for construction during the year were $286,482.

To take up the railway property in the Missouri group, the United Railways of St. Louis, it may be said that the operating revenues of this company for 1916 amounted to $12,641,293, an increase of $960,093 or 8.22 per cent. The operating expenses, including taxes and reserves, increased $376,933 or 4.23 per cent, and the interest charges rose $54,712 or 2.10 per cent, so that the net income increased $621,977 or 234.24 per cent. Expenditures for new construction during the year amounted to $283,420.

During the year the securities owned by the North American Company were revalued by a committee. The amount at which the 184,000 owned shares of common stock of the United Railways of St. Louis was carried on the holding company's books was reduced to $1. The net decrease in book value was $2,600,000, which was charged to the "contingent security depreciation reserve" created in 1914, leaving a balance of $50,000 to the credit of such reserve.

Canadian Earnings for 1916

According to the annual returns to the Comptroller of Statistics, the gross earnings from operation of Canadian electric railways for the year ended June 30, 1916, totaled $27,416,284. The gross in 1915 was $26,922,899, so that the last year showed a gain of $493,385 or 1.8 per cent. The 1916 result was still less than that of 1913 or 1914, but greater than that of any preceding year.

In 1915 the passenger earnings had decreased $2,301,639 or 10.9 per cent, and the freight earnings $141,869 or 12.6 per cent. This showing, however, was bettered in 1916, for the passenger earnings gained $57,639 or 0.3 per cent and the freight earnings $236,722 or 24.1 per cent. All the other earnings items showed increases with the exception of the rent of land and buildings and the sale of power. The latter dropped $44,866 to a total of $59,325.

The operating expenses for 1916 at $18,099,905 represented a decrease of $31,937 or less than 0.2 per cent. The operating ratio in 1916 was 67.24 per cent as compared to 67.40 per cent in 1915. The details of operating expenses were not received from certain corporations, items being lacking for $3,713,996 of the operating expenses in 1915 and $3,707,053 in 1916. With this in mind, it may be pointed out that in the last year maintenance of way and structures decreased $78,346 or 7 per cent; maintenance of equipment $186,662 or 12 per cent, and operation of cars $180,272 or 2.5 per cent. On the other hand, operation of power plant increased $73,662 or 2.5 per cent, and general expenses $346,624 or 19 per cent.

The net earnings from operation for 1916 at $9,316,379 showed a gain of more than 6 per cent. After adding $2,928,573 for miscellaneous income and making deductions of $7,358,283, the net income amounted to $4,886,669. Reserves took up $1,535,071 of this, and dividends $2,834,906, so that the surplus for the year totaled $516,690.

The number of fare passengers carried in 1916 was 580,094,167, as compared to 562,302,373 in 1915. The total of freight hauled was 1,936,674 tons, as compared to 1,433,602 tons in the preceding year. The paid-up capital for 2248.57 miles of single track in 1916 was $154,895,584, as compared to $150,585,342 for 2102.95 miles in 1915.

Report of Virginia Commission

The total transportation revenue of the nineteen electric railways under the supervision of the State Corporation Commission of Virginia amounted to $5,083,341 for the fiscal year ended June 30, 1915. This showing involved the following decreases: Passenger, $384,087 or 7.42 per cent; parlor, dining, special and baggage, $7,336 or 41.70 per cent; mail, express, milk, switching and miscellaneous, $16,629 or 24.87 per cent, and freight, $95,822 or 29.61 per cent. Revenue from other railway operations fell off $23,710 or 29.87 per cent, and the total revenue decreased $527,587 or 9.31 per cent.

The total operating expenses decreased $320,128 or 9.14 per cent to $3,181,576. Maintenance of way and structures dropped $51,535 or 10.04 per cent; maintenance of equipment, $85,607 or 21.13 per cent; conducting transportation, $539,619 or 28.35 per cent, and traffic, $14,493 or 28.69 per cent. The net income for the year at $1,164,671 showed a gain of $17,809 or 1.55 per cent. The total number of passengers carried was 113,194,803, the revenue passengers being 95,895,127. The average fare for all passengers was 4.016 cents, a decrease of 0.024 cent, while the average fare for revenue passengers was 4.741 cents, a decrease of 0.029 cent.

Maine Income Gains Slightly

The net income of the electric railways in Maine for the year ended June 30, 1916, showed a slight increase from $629,448 to $632,025. The dividends declared rose from $402,797 to $419,347, the percentage on capital stock increasing from 2.50 to 2.59 per cent. These figures are taken from the second annual report of the Maine Public Utilities Commission.

The operating revenues of all the companies totaled $3,102,357 in the last fiscal year, with operating expenses amounting to $2,033,587. The surplus increased from $849,334 in 1915 to $958,215 in 1916. Other comparative data regarding capitalization and income are presented in the accompanying table.

CAPITAL STOCK, INDEBTEDNESS, GROSS REVENUES LESS OPERATING EXPENSES (GROSS INCOME) AND DISPOSITION OF GROSS INCOME OF MAINE ELECTRIC RAILWAYS

Name	Capital Stock	Funded Debt	Other Interest-bearing Debt	Gross Income	Interest Deductions	Other Deductions Prior to Distribution to Stockholders	Net Income	Dividends Declared
Androscoggin Electric Company	$2,000,000	$3,140,500	......	$287,130	$156,357	$1,753	$129,019	$37,500
Aroostook Valley Railroad	256,400	887,432	......	43,303	46,888	......	*3,585	......
Atlantic Shore Railway	1,000,000	2,477,250	......	60,710	118,475	......	*57,764	......
Bangor Railway & Electric Company	3,499,936	2,599,000	......	358,223	129,873	89,961	138,388	144,997
Benton & Fairfield Railway Company	20,000	33,000	......	1,948	1,650	......	298	......
Biddeford & Saco Railroad	100,000	150,000	......	18,212	6,000	......	12,312	10,000
Calais Street Railway	100,000	100,000	......	10,131	5,000	......	5,131	5,000
Cumberland County Power & Light Company	4,996,800	5,339,000	......	932,589	254,180	413,546	264,861	138,000
Fairfield & Shawmut Railway	30,000	30,000	$1,000	1,660	1,560	......	100	300
Lewiston, Augusta & Waterville Street Railway	3,000,000	3,659,000	6,000	261,538	179,482	12,916	69,139	36,000
Oxford Electric Company	80,000	166,000	......	15,948	6,917	12	9,018	4,065
Rockland, South Thompson & St. George Railway	......	......	......	......	......	......	......	......
Rockland, Thomaston & Camden Street Railway	400,000	800,000	20,000	75,055	32,971	90	41,993	20,000
Somerset Traction Company	30,000	75,000	48,050	1,591	2,290	......	*698	......
Waterville, Fairfield & Oakland Railway	500,000	......	......	25,351	......	......	25,351	23,485

*Deficit.

Indiana Tax Figures

The State Tax Board of Indiana, which has just completed its first spring session, shows the total valuation of interurban railways of the State as $26,228,335, a decrease of $113,366 under the 1916 valuation. The interurban lines show a total loss of 17.47 miles of main track in 1917 over 1916 and a gain of 15.97 miles of second main track. A gain of 9.71 miles of side track was reported and a loss of 18.50 in rolling stock mileage. These figures resulted in money valuation gains and losses as follows: Main track, $243,038 loss; second main track, $102,080 gain; side track, $28,500 gain; rolling stock, $628 loss. The total improvements on right-of-way were valued by the board at a loss of $280 over last year's total. The total valuation of interurban improvements on right-of-way this year was $1,106,877. Only three interurban railways were raised in valuation on main track, the Hammond, Whiting & East Chicago Railway, the Interstate Public Service Company and the Southern Michigan Railway. The Indianapolis Traction & Terminal Company was valued at an increase of $85,338 over last year, due to natural increase in trackage. The Indianapolis Street Railway valuation showed a loss of $150,426, due to a rearrangement of tracks. The Terre Haute, Indianapolis & Eastern Traction Company was valued at $81,543 less than last year's total, due to a shortening of the tracks of the company.

Connecticut Returns for 1916

Total Revenues Increase $1,445,387 and Net Operating Revenue $811,324

The fifth annual report of the Connecticut Public Utilities Commission contains the following summary of operating revenues and expenses of electric railways in the State for the two years ended June 30, 1915 and 1916:

REVENUE	1915	1916	Increase
Passenger revenue	$14,063,141	$15,336,166	$1,273,024
Freight revenue	618,387	769,258	150,870
Express revenue	82,589	90,589	8,000
Other transportation revenue	93,419	90,527	•2,892
Station and car privileges	59,062	63,340	4,277
Rent of tracks and terminals	55,347	60,598	5,250
Power	86,178	93,263	7,084
Other operating revenue	40,444	40,217	•227
Total operating revenues	$15,098,572	$16,543,960	$1,445,387
EXPENSES			
Maintenance of way and structures	$1,986,638	$1,859,325	•$127,312
Maintenance of equipment	1,121,545	1,222,640	101,095
Traffic expenses	8,023	18,605	10,582
Conducting transportation expenses	5,615,749	6,189,924	574,175
General and miscellaneous expenses	1,336,427	1,411,951	75,524
Total operating expenses	$10,068,384	$10,702,447	$634,063
Net operating revenue	$5,030,188	$5,841,513	$811,324

•Decrease.

The total operating revenue increased $1,445,387 or 9.5 per cent during the year ended June 30, 1916. All classes of operating revenue showed increases except those from miscellaneous sources. Operating expenses rose $634,063 or 6.3 per cent. Of this increase $574,175 was on account of expenses of conducting transportation. All items in the operating expense group increased except maintenance of way and structures. The net operating revenue for the last fiscal year showed a gain of $811,323 or 16.1 per cent.

The amount paid for taxes of all kinds was $124,871 less than for the year previous, the total amount paid being $971,753. Interest charges on funded and floating debt increased $17,454. With other miscellaneous deductions from income the total deductions for the year were $4,937,704, leaving a net corporate income of $2,846,019. Against this was charged $62,755 for reserve and special charges and $1,355,804 for dividends. The surplus as of June 30, 1916, was $2,691,181, an increase of $491,029 over the surplus of the year before. On the same date the cost of road, equipment and general expenditures totaled $90,759,894, an increase of $286,225. The expenditures on account of leased lines totaled $15,794,327, this amount being an increase of $811,706.

Cleveland Costs Soar

The operating report of the Cleveland (Ohio) Railway for April shows an income of $827,079, an increase of 6.67 per cent over the same month last year. The cost of maintenance was $115,989, or $32,795 more than the allowance. However, a surplus of $5,384 is shown in the operating fund. An increase of 1 cent an hour in the wages of motormen and conductors took place on May 1 and the surplus in the operating fund will in all probability be more than taken up by this. Wages aggregated $28,000 more than in April, 1916.

The number of car-miles operated was 2,888,077, an increase of 7.64 per cent over April last year. The number of passengers carried was 32,499,228, an increase of 6.13 per cent over the corresponding month last year.

Some doubt as to the fate of the interest fund has been caused by the report. It shows a decrease of $9,871 as compared with the March figures and is in contrast with a surplus of $75,305 for April, 1916.

Employment of many inexperienced men is said to be one of the principal causes of the increase in accidents, as shown by the reports of the company for the past several months. Damage claims for April exceeded those of a year ago by $22,366, and for the first four months of the year there was an increase of approximately $80,000 over the same period in 1916.

Permits Railroad Merger

The Thompson bill permitting the merger of railroad corporations under certain conditions was signed by Governor Whitman of New York on June 7. It provides that a business corporation owning two-thirds or more of the capital stock of a railroad corporation or of each of two more railroad corporations, may become a railroad corporation with the consent of the holders of two-thirds or more of the capital stock, and may merge the railroad corporations. The bill also regulates the procedure and the rights of minority stockholders and creditors. The signing of the Thompson bill will permit the consolidation of the surface and elevated roads in Brooklyn and simplify the intercorporate relations between the Brooklyn Rapid Transit Company and its subsidiaries.

American Public Service Company, New York, N. Y.—Confirmation has been obtained of the reported sale of the American Public Service Company to the Insull interests of Chicago. The company controls a number of public utility properties in Texas and Oklahoma, among them the Marshall (Tex.) Traction Company.

Bay State Street Railway, Boston, Mass.—The Bay State Street Railway has been authorized by the Massachusetts Public Service Commission to issue $117,100 of first preferred stock at par, $91,000 of Boston & Northern Street Railway and $27,000 of Old Colony Street Railway 4 per cent bonds, the proceeds to be used to pay floating debt.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—The Illinois Public Utilities Commission has granted permission to the Chicago, North Shore & Milwaukee Railroad to issue $658,000 of first mortgage bonds.

Northern States Power Company, Chicago, Ill.—The Northern States Power Company has completed the purchase of the Northwest Light & Power Company, the Renville County Electric Company and the Minnesota Valley Power Company, all operating in southern Minnesota, communities having an aggregate population of 26,000. The total capacity of the various power stations of the three utilities aggregates 2400 kw. One of the plants is operated by water power, having a capacity of 400 kw., which is capable of being increased to 900 kw. The communities in which the companies operate are connected with the power plants by transmission lines aggregating 200 miles in length, and will be connected into the general transmission systems and large water powers of the Northern States Power Company. The gross earnings of the companies acquired for 1916 were $198,000 and the net earnings $89,000.

San Francisco-Oakland Terminal Railway, Oakland, Cal.—The San Francisco-Oakland Terminal Railway has announced that it has deposited funds with the Wells Fargo Nevada National Bank to pay the coupons due on July 2, 1916, on the general consolidated 5 per cent bonds of the company due Jan. 2, 1933, of the Oakland Traction Consolidated Company.

West Penn Railways, Pittsburgh, Pa.—The Pennsylvania Public Service Commission has ratified the consolidation of the West Penn Traction Company and all its subsidiaries, and the shareholders have been notified that they may now receive in exchange the certificates of the merger company. The capital stock of the new company consists of $10,000,000 of 6 per cent cumulative preferred stock and a like amount of common stock. The officers of the new company are: Samuel Insull, president; John F. Gilchrist, vice-president; Raymond B. Keating, vice-president and secretary; Williston Fish, vice-president; H. S. Swift, treasurer. The plan of consolidation was referred to in the ELECTRIC RAILWAY JOURNAL of May 5, page 845.

Dividends Declared

Arkansas Valley Railway, Light & Power Company, Pueblo, Col., quarterly, 1¾ per cent, preferred.

Brooklyn (N. Y.) Rapid Transit Company, quarterly, 1½ per cent.

Ironwood & Bessemer Railway & Light Company, Ironwood, Mich., quarterly, 1¾ per cent, preferred.

Memphis (Tenn.) Street Railway, 2½ per cent, preferred.

Tri-City Railway & Light Company, Davenport, Iowa, quarterly, 1½ per cent, preferred.

West Penn Traction & Water Power Company, Pittsburgh, Pa., 1½ per cent, preferred.

Electric Railway Monthly Earnings

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
AURORA, ELGIN & CHICAGO RAILROAD, AURORA, ILL.						
1m., Apr.,	'17	$163,746	*$116,957	$46,789	$35,642	$11,147
1 " "	'16	154,830	*106,269	48,561	36,528	12,033
4 " "	'17	633,263	*469,522	163,741	143,088	20,653
4 " "	'16	594,470	*407,546	186,924	146,225	40,699
BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.						
1m., Apr.,	'17	$85,496	*$73,224	$12,272	$27,716	†‡$15,373
1 " "	'16	78,445	*73,041	5,404	28,024	†‡22,447
4 " "	'17	330,978	*287,552	43,426	110,367	†‡66,581
4 " "	'16	290,842	*267,512	23,330	94,960	†‡70,854
CONNECTICUT COMPANY, NEW HAVEN, CONN.						
1m., Apr.,	'17	$776,809	*$622,600	$154,209	$95,965	‡$80,504
1 " "	'16	744,170	*546,678	197,492	98,009	‡122,525
4 " "	'17	3,090,911	*2,470,162	620,749	383,811	‡296,487
4 " "	'16	2,878,552	*2,050,194	828,358	391,911	‡527,290
FEDERAL LIGHT & TRACTION COMPANY, NEW YORK, N. Y.						
1m., Apr.,	'17	$219,531	*$148,232	$71,199	$49,574	$21,625
1 " "	'16	203,175	*135,086	68,089	48,723	19,366
4 " "	'17	932,456	*603,673	328,783	198,435	130,348
4 " "	'16	861,788	*574,841	286,947	195,396	91,551
HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.						
1m., Apr.,	'17	$524,053	*$244,504	$279,549	$217,880	$61,669
1 " "	'16	503,689	*209,981	293,708	214,117	79,591
4 " "	'17	2,107,514	*954,778	1,152,736	869,179	283,557
4 " "	'16	1,981,711	*857,506	1,124,205	853,982	270,223
NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.						
1m., Apr.,	'17	$27,447	*$25,821	$1,626	$7,982	†‡$6,294
1 " "	'16	27,135	*24,098	3,037	7,979	†‡4,903
4 " "	'17	104,758	*111,210	†6,452	31,943	†‡38,215
4 " "	'16	98,555	*92,297	6,258	31,940	†‡25,528
NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.						
1m., Apr.,	'17	$48,100	*$43,915	$4,185	§$6,139	†‡$1,167
1 " "	'16	44,833	*43,965	868	§4,759	†‡2,558
4 " "	'17	178,628	*185,234	†6,606	§29,002	†‡30,805
4 " "	'16	162,852	*215,087	†52,235	§26,930	†‡72,679
RHODE ISLAND COMPANY, PROVIDENCE, R. I.						
1m., Apr.,	'17	$459,618	*$423,993	$35,625	$119,610	†‡$57,459
1 " "	'16	444,826	*311,539	133,287	118,902	†‡41,338
4 " "	'17	1,827,938	*1,551,858	276,080	477,119	‡144,695
4 " "	'16	1,735,208	1,353,771	381,437	439,043	†‡1,272
WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.						
1m., Apr.,	'17	$20,254	*$23,573	†$3,319	$2,033	†‡$5,327
1 " "	'16	20,071	*21,151	†1,080	1,755	†‡2,813
4 " "	'17	70,666	*88,429	†17,763	8,088	†‡25,744
4 " "	'16	72,689	*82,369	†9,679	6,951	†‡16,531

*Includes taxes. †Deficit. ‡Includes non-operating income. §Includes interest on bonds, charged income and paid by the New York, New Haven & Hartford Railroad under guarantee; also interest on notes held by the New York, New Haven & Hartford Railroad, not credited to income of that company.

Traffic and Transportation

Washington Jitneys Without Bonds

Jitney Men Go to Supreme Court for Injunction Against Interference—Some Operate Cars for Contributions

Since the bonds issued by the Casualty Company of America were declared void the jitneys in the State of Washington have continued their fight for permission to operate until satisfactory bonds can be issued. This situation was referred to at some length in the ELECTRIC RAILWAY JOURNAL for May 26, page 980.

An appeal has been made to the Supreme Court from a recent decision of Judge Gilliam denying an injunction applied for by E. A. Hatfield, president of the Seattle Auto Drivers' Union, to prevent Prosecuting Attorney Lundin from prosecuting operators who were without a $2,500 bond as required by law. Hatfield petitioned for an injunction to stay the State's hand following the announcement of State Insurance Commissioner Fishback that the Mutual Union Insurance Company, formed by jitneymen to write surety bonds for the benefit of its members, would not be recognized until a cash security of $250,000 is posted at Olympia. Commissioner Fishback has been ordered by an alternative writ of mandate issued by Chief Justice Ellis to show cause why he does not issue a certificate to the Mutual Insurance Company. He refused to accept notes as assets for the required security. The petition sets forth that in a formal opinion Attorney-General Tanner has held that the members have insurable interest and that the surety bonds can be written if the law is complied with in other respects.

MEN OPERATE "FREE BUSES"

The Puget Sound Traction, Light & Power Company, Seattle, has obtained from Judge Everett Smith in the King County Superior Court, an order to restrain twenty-five jitney drivers from operating along streets included in the company's franchises. As a result of Judge Smith's order, twenty-five jitneys have been operating "free bus" cars for which no fare is solicited, but passengers are expected to "contribute." Inside the cars the following notice is posted: "Donations accepted for our fight with the traction company."

Counsel for the jitney men made an unsuccessful attempt to have Judge Smith dissolve the order. They contended that Judge Gilliam's action in permitting them to appeal to the Supreme Court was a stay to further proceedings. Judge Smith, however, ruled that the criminal proceeding did not bar a civil action and denied the motion. James B. Howe, counsel for the traction company, argued that the company, in bringing suit, was demanding protection of its franchise rights.

The "free bus" plan now used pending the hearing in the State Supreme Court was established as a precedent one year ago in West Seattle, when a jitney driver was arrested for operating without a bond. At a trial in Judge Frater's court, he was fined 1 cent, which Judge Frater announced he himself would pay.

Jitney operators in Spokane have been denied a temporary injunction against city and county officials to forbid the enforcement of the bonding law. In refusing the injunction, Judge Hurn in the Superior Court ruled that the city has authority to regulate street traffic, and that legislative enactment requiring that jitney bus owners give bond is not unconstitutional or prohibitive. The order will require that jitney buses in Spokane cease to operate when the last of the bonds expire in November, unless some means of furnishing bonds is found.

A number of jitney drivers in Everett have been arrested for operating without bonds. Drivers were released on bail. The jitney men in that city plan to join Seattle drivers to take the matter to the Supreme Court.

Portland Election Favorable

Jitney Legislation Most Important Feature of Constructive Program Put Through on Monday

The city of Portland, Ore., went on record decisively for a broad constructive program and sound business administration at the election there on June 4. Commissioner George L. Baker was elected Mayor over Commissioner W. H. Daly, the municipal ownership, union labor, "jitney" and Socialistic candidate. The ordinance requiring a $2,500 jitney bond was carried by 32,000 to 16,000. The charter amendment proposed by the jitney interests to permit free and unrestricted use of the streets by jitneys without franchise or bonds was defeated by practically the same vote as for the bond requirement.

The four so-called "Carver" jitney franchises calling for operation of regular motor-bus service with fixed routes, definite schedules, transfers, heavy bonds and other satisfactory regulations was carried by a heavy vote. These franchises will give the districts now without transportation facilities a service supplementary to, and not competitive with, the street railway lines. The defeat of Mr. Daly, together with the election of two substantial business men for city commissioners and the elimination of unregulated jitney service, which Mr. Daly, as commissioner, has made possible for the last two years, is taken to presage better times for Portland. The ordinance forbidding picketing was passed by a narrow margin.

Atlantic City Jitneys Lose

The jitney men of Atlantic City have continued an uphill fight against the City Commissioners and the Atlantic City & Shore Railway since they were compelled to cease operating on Atlantic Avenue some time ago. Vice-Chancellor Leaming, from whom S. Cameron Hinkle, counsel for the jitney association, obtained a rule to show cause why city authorities should not be restrained from enforcing ordinances excluding jitneys from Atlantic Avenue and raising the jitney license fee to $50 per annum, refused an injunction and dismissed the proceedings. The court's action sustains the contention of Joseph B. Perskie, assistant city solicitor, that the proper recourse for the jitney men is to review the constitutionality of the ordinances before the Supreme Court.

Application has been made by the jitney men to the Supreme Court for a writ of mandamus compelling the City Commissioners to receive the petitions, containing more than 4000 signatures, which call for submission of the ordinances to the people under the referendum clause of the commission government act. The city contends that the ordinances were not drawn under commission plan authorization and consequently are not subject to the referendum test.

New Automobile Law

Recent Legislation in Connecticut Affects Operation of All Motor Vehicles

Connecticut's new automobile law, most of the provisions of which became effective on June 1, is expected to prove helpful in regulating more satisfactorily auto and jitney traffic since it embodies many changes in the old laws. All jitney owners in the future, in addition to paying the regular motor vehicle fees, must obtain a special license at a fee of $2, and operators a special license at a fee of $5. Cities and towns are given the right to regulate jitney routes and public stands. The interior of all jitneys must be lighted at night and no passengers will be allowed to ride on the running boards.

A new rule is established whereby every driver of a motor vehicle must give way at street intersections to any vehicle approaching from the right. This replaces the old rule giving north and south traffic the right of way. Applicants for licenses in the future will have to submit to a road test. A speed of 20 m. p. h. through thickly settled portions, if continued for a quarter of a mile, shall be evidence of reckless driving and 25 miles an hour will be so considered on roads where the houses are less than 100 ft. apart.

All commercial vehicles are required to carry reflectors if their construction is such that a driver's view to the rear is obstructed, and a motor truck must make way for any vehicle approaching from the rear. The fees for trucks have been increased to $100 for each ton above 8 tons.

The new law deals severely with drunken drivers, the minimum penalty for a first offense being the suspension for a year of all licenses and registrations of the convicted party, while a second offense will mean suspension for five years. An automobile owner arrested for drunkenness, even when not operating a car, may lose his license, as the new law requires that courts report all convictions for drunkenness of men who own or drive cars. The law also includes regulations for headlights and other provisions of a minor nature.

Near-Side Stop Adopted.—The Columbus (Ga.) Railroad has abandoned the far-side stop. The company believes that near-side stop operation involves less danger to the public at crossings.

Universal Transfers in Bellingham.—The Puget Sound Traction, Light & Power Company, Bellingham, Wash., has introduced the universal transfer system. The destination point is punched instead of the receiving line.

Seattle W. C. T. U. Opposes Smoking in Cars.—The City Council of Seattle has received a petition from the Federated Women's Christian Temperance Union, representing the eighteen local unions of the city, to prohibit smoking on all public conveyances.

Electric Heaters for Cars in Waco.—The City Commissioners of Waco, Tex., have ordered an ordinance to be drafted requiring the Texas Electric Railway, which owns and operates the street car lines in Waco, to heat its cars with electric heaters instead of oil stoves.

"Have You Forgotten Anything?"—The San Francisco-Oakland Terminal Railway, Oakland, Cal., has found it worth while to equip all of its cars with a small sign reading, "Have You Forgotten Anything?" The idea resulted from the large volume of business which the lost article department has been handling. A check will be made to see whether the sign effects any decrease in the articles left in cars and boats.

Holyoke Street Railway Seeks Increased Revenue.—L. D. Pellissier, president of the Holyoke (Mass.) Street Railway, has petitioned the Public Service Commission of Massachusetts to grant higher fares on the road or else to approve a rearrangement of fare zones in which passengers will be required to ride shorter distances than the present fares permit. A hearing will be held at the offices of the board in Boston on June 19.

Traffic Committee Appointed in New Orleans.—An investigation of transportation facilities in New Orleans, La., with a view to recommending remedies for street car congestion and to lay plans for improvement in the service is to be made by a committee named from members of civic and commercial bodies of the city. A representative of the city government and one for the New Orleans Railway & Light Company will be on the committee, which will report within a few weeks.

New Transfers Used at Syracuse.—The New York State Railways, Syracuse Lines, began on June 1 the use of a new style of transfer. Heretofore a different transfer was used for the morning and afternoon of each day of the month, which meant that sixty-two forms were necessary for each line. The new style is designed so that only one form need be carried in stock for each line. The station master will punch the month and the day of the month as before and the conductor will indicate the time of issue and the receiving line.

C., M. & St. P. Issues Descriptive Booklet.—A small illustrated booklet descriptive of the electrified divisions of the Chicago, Milwaukee & St. Paul Railroad has just been published. Much interesting information of a technical nature is contained therein, so presented as to be of value to the layman. The facts relative to the work of the powerful locomotives and comforts of the service on the two trains, "The Olympian" and "The Columbian," are among those given to show that this electrification marks "the dawn of the electrical era in railroading."

Information Booklet for Milwaukee.—A handy little booklet has been issued by The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., entitled "A Street Railway of Milwaukee." It gives the location of parks, public buildings, depots, hotels, theaters, principal industries and other information in regard to the city. A map of the city street carlines is attached, with a key to street numbers arranged to indicate the shortest way of reaching any part of the city. The booklet is being distributed through hotels, business associations and other agencies and will no doubt fill a long-felt want.

Serious Accident at Kenosha.—What probably would have been a fatal accident on the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., on May 15, was avoided when one of the cars was derailed by a towerman on the Kenosha & Rockford Division of the Chicago & Northwestern Railway to prevent a collision with one of the steam trains. The accident occurred at the crossing of the two tracks near Prairie Avenue, Kenosha, Wis. The car tipped over on its side as it plunged into the ditch, and several of the thirty-two passengers aboard, together with its crew, were injured.

H. & F. Fares Increase.—In accordance with the new tariff filed with the Maryland Public Service Commission by the Hagerstown & Frederick Railway, Frederick, as reported in the ELECTRIC RAILWAY JOURNAL recently, the change in rates of fare became effective on May 30. The changes do not affect the fares in the local city lines in Hagerstown and Frederick except for the discontinuance of ticket books, the use of which represented only about one-quarter of the total fares collected. On the interurban lines the cash fare will be increased from 5 cents to 6 cents per zone and ticket books containing eighteen coupons will be sold for $1. No increase was made in commuters' rates.

Boise Valley Wants One-Man Cars.—The Boise Valley Traction Company, Boise, Idaho, has asked permission of the Public Utilities Commission of that State to operate one-man cars, claiming that a saving of $8,800 can be effected annually. It is proposed to remodel for one-man car operation the cars now being used on the city lines. In the application that was filed the company asked the commission to set a date for a hearing when the city authorities and others interested in the proposed change could be heard. A bill was introduced in the lower house of the Idaho Legislature at the last session which forbade street railway companies to operate cars with less than two men. The measure was not passed.

Jitneys Barred From Busy Corner.—The Selectmen of Greenfield, Mass., have made the following traffic rule as a measure of relief from the congestion of automobiles and jitneys at the corner of Main and Federal Streets: "No owner or driver of a vehicle engaged in carrying passengers from whom fare is collected shall stop or stand on Main, Federal, Clay Hill or High Streets, except for the purpose of receiving or discharging passengers, and then only at such places as may be designated by the Board of Selectmen and for such time as may be sufficient to enable the passengers to get off or on such vehicle." The Selectmen will designate the places at which jitneys may receive or discharge passengers.

Companies Ask to Discontinue Tickets.—Two petitions for the discontinuance of ticket books on the street railways centering in New Bedford, Mass., have been filed with the Public Service Commission of that State. The first asks for the discontinuance of a twenty-ride book which is sold at $1 on the New Bedford & Onset Street Railway. It is said that passengers riding from New Bedford to Onset have taken unfair advantage of the use of these tickets to obviate the necessity of paying a cash fare in each zone. The second petition, made by the Union Street Railway, asks for authority to discontinue the fifty-ride monthly ticket books which are sold for $8 for use between New Bedford and Fall River. The cash fare between the two cities is 20 cents.

Ferry Service to Relieve Seattle Congestion.—The Seattle Port Commission is negotiating with the Puget Sound Traction, Light & Power Company for an exchange of transfers, to provide ferry service between the foot of Marion Street and Harbor Island and the west side of the west waterway. The proposition presented by the commission was for the traction company to receive 3 cents out of each 5 cents. No agreement has yet been reached. The object of the proposed ferry is to relieve the congestion in traffic on West Spokane Avenue, where 15,000 men employed in the shipyards and manufacturing plants on Harbor Island must be transported. The commission will make the same proposal to the City Council or to the public utilities department for transfer privileges with the city's Lake Burien line.

Play Safely with the New Man.—As a safety-first suggestion W. H. Parr, an employee of the Louisville (Ky.) Railway, recently submitted the following: "Remember the new man. So many employees are at work in our shop that every man must be careful in his work at all times. The carhouse foreman cannot do it all. The inspector cannot do it all. Careful work is the surest safeguard. Just be careful and remember the new man. You know the unsafe places and the unsafe ways, but he does not. Your first duty to the company is to prevent accidents. A few words of advice in time may save some one from a painful injury. Do your share. We are all paid to observe the rules. Is there any excuse for not obeying them? Carelessness is one crime where punishment is quick and sure. So it is up to you first, last and always."

Pacific Electric Lowers Fare.—Upon the request of the Railroad Commission of California, the city of Pasadena has dismissed its suit to require the Pacific Electric Railway to lower its fare from 10 cents to 5 cents for points along the East Orange Grove Avenue line between the old and new city limits of Pasadena. The company agreed to the change in its fares after it had received assurance from the commission that the act would not establish a precedent and force the acknowledgment that the addition of territory necessitates extending the 5-cent fare to that territory. It stated that lowering the rate in this case would make no appreciable difference in revenues because most of the people in the new territory had walked to the 5-cent fare limit and because there is little likelihood of an extension of the line on account of the nature of the territory served.

Automobile Traffic Puzzles Louisville.—Officials of the Automobile Club of Louisville, Ky., have become aroused by the failure of the city officials to enforce the traffic laws and are taking the initiative in the matter. An invitation to the club from the Board of Public Safety to assist in framing revised regulations has been received with interest and representatives of the club are resuming the study of traffic regulations. Except in the center of the city when the traffic police are on duty there is a general disregard for the provision that requires automobiles and other vehicles trailing street cars to stop when the cars stop to take on or let off passengers. Glaring headlights are used without molestation. Cars are parked freely on the forbidden side of the streets, while slowly-moving vehicles disregard the provision requiring them to hug the curb and invariably ride the rails.

Consolidated Will Not Ask Increase.—The Worcester (Mass.) Consolidated Street Railway, according to a statement given out by General Manager Page, will not ask the Public Service Commission for authority to increase its fare to 6 cents in accordance with the general movement for more revenue. He said that in Springfield, where it has been decided to ask for the 1-cent increase, the transportation conditions are quite different. Mr. Page expressed the attitude of the company as follows: "I have confidence that we have seen the worst of the high cost of living and of materials. The investigation of conditions being conducted by the federal government will, I expect and hope, bring relief from the burden to the public. The Consolidated officials are sitting tight on the lid, keeping down expenses as much as possible, and hope to be able to continue giving the public satisfactory service until the turn for the better comes in business conditions and we can go into the market for improved equipment."

Street Cars Versus Autos.—The following letter was received by the Pine Bluff (Ark.) Company from an auto driver who adores trafficless autoing, so says *Public Service*, that company's publication: "Gents: It occurs to me 'and while I'm talking my opinions good' that to facilitate the proper kind of auto traffic you should use an advance guard in the operation of your street cars, the duties of this man should be to walk along, say 50 ft. ahead of each street car, and as autos approach the car track for this guard to signal the motorman to stop—you might install a wireless set on each guard and car so these signals can be transmitted quickly in order not to delay auto traffic. I'm working on a patent 'hurdler' for street cars so they can hurdle autos as an important time saver. As each street car carries, say ten to twenty passengers, and each automobile the large number of 'one' to 'five' you can readily see auto traffic must not be interfered with by street cars."

Accidents on Increase in New York.—Forty persons were killed in New York City by motor vehicles during the month of May as compared with twenty-seven for the corresponding month in 1916, according to the monthly traffic accident report of the National Highways Protective Association. The total number of deaths from traffic accidents was forty-seven, three of which were caused by trolleys and four by wagons as against four by trolleys and ten by wagons in May, 1916. In the State outside of New York City twenty-six persons were killed by automobiles, two by trolleys and one by wagon. Of those killed in the city twenty-five were children and in the State eight. Eight were killed at highway railroad grade crossings in the State during the past month. Regarding the increase in the number of deaths by automobile accidents, Colonel Edward S. Cornell, secretary of the association, said: "There is only one way to put a check on this slaughter, and that is by a law requiring all who drive automobiles to have a license, based on qualification, instead of limiting this requirement to chauffeurs, as is done at present."

Commission Discusses Grade Crossing Order.—A hearing was held on June 6 by the Public Service Commission of New York, First District, to consider the proposal of the commission to order railroad crossing gates on the lines within its jurisdiction to be kept closed constantly between midnight and 5 a. m. Reports were received covering inspections of the operation of crossing gates which were conducted by the commission. The problem seems to lie in the failure of gatemen to keep awake at night to attend to duty properly. Keeping the gates normally down except when raised to permit the passage of vehicles would be virtually prohibitive on highways having a heavy vehicular traffic. Among alternative measures recommended were the use of a clock-punching system, irregular inspections of the men on duty supplemented by discipline, and the use of semaphores interlocked with the gates to give a stop indication when the gates are up. The commission will co-operate with the police department in making a more thorough study of the crossings to determine how generally it would be practicable to operate the gates normally down as proposed.

Rerouting Complaint Dismissed.—The Public Service Commission of Pennsylvania has announced that it has dismissed the complaint of the Central Germantown Avenue Business Association against the Philadelphia Rapid Transit Company relative to the rerouting of cars operating on routes known as 23 and 55. The complaint was directed particularly against the rerouting so that the cars do not now, as formerly, pass along portions of Germantown Avenue between Glenwood and York Streets. Commissioner Ryan dissented, it was said, when the decision of the other members was made known, but his reasons are not given. The contentions of the complainants were based on the fact that the cars on routes 23 and 55 in going northward did not pass their places of business and that on account of this fact business had been diverted elsewhere. It was also claimed that the rerouting was illegal in that the charters fix the routes. The commission holds that it cannot be said that the increasing or decreasing facilities on certain streets as long as service is maintained is in violation of the charter obligations of the respondent company and its underlying concerns.

Personal Mention

Phillip Matter has been elected a vice-president of the Union Traction Company of Indiana, Anderson, Ind.

Elihu S. Rowley, heretofore day dispatcher at the Light Street carhouse of the United Railways & Electric Company, Baltimore, Md., has been promoted to the position of instructor of conductors.

A. J. Davis has been engaged by the Kansas City (Mo.) Railways to manage a new express department. The company expects to be prepared to give express service on its lines in the near future.

F. D. Burpee, superintendent of the Ottawa (Ont.) Electric Railway, has obtained leave of absence for military service. He is now a major in the 207th Battalion, which was recruited in Ottawa and is now overseas.

H. W. Huston, general foreman of the Elyria shops of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, has resigned to take a similar position in the Erie shops of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y.

Paul A. Zinsheimer, head of the stock and bond department of the Railroad Commission of California for five years, has resigned to accept a position with the Union Trust Company, San Francisco, Cal., as assistant to I. W. Hellman, the president.

Allen G. Hoyt of the National City Company, New York, N. Y., which is affiliated with the National City Bank of that city, has been elected a vice-president and a director of the Washington Railway & Electric Company, Washington, D. C. Mr. Hoyt was formerly president of the American Public Service Company, New York, before that company was acquired by the Insull interests of Chicago.

H. E. Brandli, the new general manager of the Meridian Light & Railway Company, Meridian, Miss., has led a movement among the employees of that company to form a mutual get-together club. At the organization meeting held recently a committee was named to draft a set of by-laws and a constitution. The motto selected for the organization is "Public Service—the Best That Can Be Given."

Darwin R. Cafferty, instructor of motormen for the elevated lines of the Interborough Rapid Transit Company, New York, N. Y., has received an indefinite leave of absence on account of ill health. Mr. Cafferty began his service with the company forty years ago as a locomotive operator on the Third Avenue "L." Before his departure he was the guest at a banquet attended by fifty-six of his fellow workers.

Melvin H. Fowler, line foreman of the Bay State Street Railway, Boston, Mass., stationed at Chelsea, has the distinction of being the first man enlisted as an officer in the federal merchant marine service. Mr. Fowler was appointed after a large number of applications had been rejected by the United States Shipping Board. Until he is assigned to duty he will attend training school at Harvard University under government officers.

N. B. Rhoads, superintendent of the electric and railway departments of the Jackson Light & Traction Company, Jackson, Miss., has been ordered to report at New Orleans for service in the navy as assistant paymaster. He will rank as lieutenant, junior grade. Mr. Rhoads was in naval service for three years and has since been on the reserve list. Will Brown, manager of the gas department, will assume charge of Mr. Rhoads' departments.

C. C. Collins accepted a position recently as traffic manager of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio. Mr. Collins' career as a railway man was begun in 1890 and has been largely concerned with traffic problems. In that year he became chief clerk in the traffic department of the Columbus & Eastern Railroad. This road was later merged with the Columbus, Sandusky & Hocking Railway upon its completion and Mr. Collins was made division freight agent at Toledo. When the road was sold to the Pennsylvania lines in 1898, Mr. Collins engaged in business in Porto Rico. Upon his return to Ohio and following a short connection with the Detroit, Toledo & Ironton Railroad he was appointed general express and passenger agent of the Columbus, London & Springfield Railway, Springfield, Ohio, the position he held until 1907. At that time he entered the service of the Western Ohio Railroad, Lima, Ohio, and a year later was made traffic manager of the system. He resigned this position in 1911 to take a similar one with the Lehigh Valley Transit Company, Allentown, Pa. Mr. Collins was one of the organizers of the Central Electric Railway Association and has displayed an active interest in its affairs.

J. P. W. BROWN

J. P. W. Brown, superintendent of the lighting and power departments of the Nashville Railway & Light Company, Nashville, Tenn., has been advanced to the position of assistant general superintendent, a position newly created by the company. Mr. Brown started his career with the Cumberland Electric Light & Power Company about twenty years ago. When this company was absorbed by the Nashville Railway & Light Company, two years later, he was made superintendent of light and power. While the departments have been under his direction the number of customers served has increased from 300 to 16,000. These years of successful service with the company have paved the way for his recent well-deserved promotion. Mr. Brown is a native of Nashville and a graduate of the engineering department of Vanderbilt University. He has for many years been prominently identified with civic affairs of his community and is a member of the Commercial and Hermitage clubs and other local organizations.

Obituary

Augustus Wolff, superintendent of motive power of the United Railways & Electric Company, Baltimore, Md., died on May 17 at his summer home at Kensington Road, Ten Hills. His death was due to a stroke of paralysis which he suffered about three weeks previously. Mr. Wolff began his railway career as a helper to the engineers on the old Brooklyn, Bath & West End Railroad. He later became master mechanic for the Atlantic Avenue Railroad, and when these lines were merged into the Brooklyn (N. Y.) Rapid Transit Company became chief construction engineer. In 1903 he went to San Francisco, Cal., to accept a position as superintendent of motive power for the United Railroads of that city. Mr. Wolff went to Baltimore to act in a similar capacity for the United Railways & Electric Company in 1908, after having renewed his connection with the Brooklyn Rapid Transit Company for a short period. He has been the head of the United Railways & Electric Company motive power department continuously since that time and was regarded as one of the most valuable and loyal members of the organization.

The car men's safety committee of the San Diego Electric Railway, San Diego, Cal., recently issued a statement enumerating the benefits of the mutual safety plan used by that company to reduce to a minimum street car accidents. The safety-first movement was inaugurated by William Clayton, vice-president and managing director of the company, and judging from the salient features of his plan, it is obviously far-reaching in its effect. Three per cent of the gross earnings of the company, which was the amount formerly used to cover all accident claims, is turned over to the car men. Out of this amount the men pay all accident claims and the balance left at the end of the year is divided among them. This naturally makes the men more careful to avoid accidents, which tends to safeguard the company's property and insure greater comfort and safety to the public.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Henryetta-Dewar-Kusa Traction Company, Henryetta, Okla.**—Incorporated to construct and operate an electric railway between Henryetta, Dewar and Kusa. Capital stock, $350,000. Incorporators: Barclay Morgan, G. W. Burnett, J. J. Harrison, H. R. Christopher, L. E. Drummond of Dewar, and Morton Henderson, Kusa.

FRANCHISES

Rialto, Cal.—The Railroad Commission of California has authorized the Pacific Electric Railway to construct spur tracks and sidings at grade between Riverside and Date Streets, Rialto.

New Orleans, La.—An ordinance has been introduced into the Council to amend the franchise of the Orleans-Kenner Electric Railway so as to permit freight to be hauled over the road in Jefferson Parish. The purpose is said to be to permit the line to haul material for reconstruction and repairs to its road.

Gardner, Mass.—The Northern Massachusetts Street Railway has asked the Board of Selectmen of Gardner for permission to relocate its track on Lake Street to conform with the grade and alteration of the street.

Woburn, Mass.—The Bay State Street Railway has received a franchise from the City Council of Woburn for the reconstruction and extension of its double track on Main Street.

Passaic, N. J.—The Public Service Railway has asked the Board of Commissioners for permission to construct an extension of its line through East Main Avenue from Park Place to Central Avenue.

South Amboy, N. J.—The Jersey Central Traction Company has received a franchise from the City Council to construct and operate an electric railway in South Amboy.

Brooklyn, N. Y.—The Brooklyn Rapid Transit Company has applied to the Board of Estimate for a franchise to construct a line on Van Wyck Avenue, the dividing line between Richmond Hill and Jamaica, from Fulton Street south to Rockaway Boulevard.

Ithaca, N. Y.—The Ithaca Traction Company has asked the Public Service Commission for the Second District of New York for its approval of franchises recently granted by the Common Council to that company and the Central New York Southern Railroad for extensions in Ithaca.

Youngstown, Ohio.—The Mahoning & Shenango Railway & Light Company has refused the proposition of the City Council relative to an ordinance giving the company a franchise in Poland Avenue and East Woodland Avenue to connect with the present Poland Avenue line via the South Avenue viaduct. The company states that, owing to present conditions resulting from the war, it will be unable to make any extensions not already authorized.

Portland, Ore.—The Portland Railway, Light & Power Company has received a twenty-five-year franchise from the County Commissioners to construct and operate a transmission line along the Columbia Highway.

Woonsocket, R. I.—The Rhode Island Company has received a franchise from the City Council to construct tracks on Page Street between Clinton and Social Streets.

Pleasant Valley, W. Va.—The West Virginia Traction & Electric Company of Morgantown has applied to the Town Council of Pleasant Valley to construct and operate an electric lighting system for a period of fifty years. The company has also applied for a fifty-year franchise to construct and operate a waterworks system in the town of Edgewood.

TRACK AND ROADWAY

Pacific Electric Railway, Los Angeles, Cal.—It is reported that an extension of the Victoria Avenue line may be built in Riverside to the Arlington Heights district.

San Francisco, Napa & Calistoga Electric Railway, Napa, Cal.—It is reported that this company will change its present line near Suscol. The change will eliminate a sharp curve ½ mile southeast of Suscol. Grading has been done and rails will be laid shortly.

Wilmington, Del.—Surveys of the proposed electric railway from Wilmington to Dover have been begun by Emory & Eisenbrey of Philadelphia. DeArmond Lindes, Philadelphia, is interested. [May 26, '17.]

Chicago (Ill.) City Railway.—It is reported that the Chicago City Railway will soon extend the Devon Avenue line from Western Avenue to Kedzie Avenue.

Kankakee & Urbana Traction Company, Urbana, Ill.—An extension about 1 mile long will be built by the Kankakee & Urbana Traction Company across one side of the new aviation field which the government has located adjacent to the company's right-of-way near Rantoul.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.—Work will soon be begun by this company removing its bridge over the canal feeder at the Centlivre brewery. The north track will be taken out and a temporary passageway made until the work of removing the bridge has been finished. Several cars of cinders have been dumped into the old canal bed and as soon as it has settled sufficiently the city will pave it. This action will eliminate a dangerous bridge.

Kansas City-Western Railway, Kansas City, Kan.—The Kansas City-Western Railway has begun the work of improving its lines in Leavenworth.

St. Louis-Kansas City Electric Railway, Kansas City, Mo.—A bill in equity asking that a receiver be appointed for the St. Louis-Kansas City Electric Railway has been filed in the Circuit Court by H. B. Cochrane and Ira G. Hedrick, engineers. The company was organized in 1909 with a capital stock of $15,000,000 and only 1 mile of double track near Independence has been built.

Great Falls (Mont.) Street Railway.—The Montana Power Company, operating the Great Falls Street Railway, in a communication addressed to the City Commissioners, has gone on record as being unwilling to expend a large amount of money in the construction of a bridge at First Avenue North unless the city is also willing to build a similar structure at Fifteenth Street. The present bridge at Fifteenth Street will have to be replaced and the First Avenue North bridge is entirely inadequate for traffic. Should the city build only the First Avenue North bridge, the company would be compelled, in the near future, to build a private structure at Fifteenth Street to provide service for the north and west sides. The company estimates that the bridges could be constructed for about $200,000 each. The company would be willing to participate in their construction to the extent of $50,000 providing the city will construct both bridges and grant the railway rights over both for a reasonable term of years. The company is willing to extend its lines to the west side, although they would have to be operated at a loss for some time, but only on the conditions set forth.

Atlantic Coast Electric Railway, Asbury Park, N. J.—This company will reconstruct its tracks on F Street, Belmar, to conform to the new grade.

Salem & Pennsgrove Traction Company, Salem, N. J.—Plans are being made by the Salem & Pennsgrove Traction Company for the erection of a drawbridge at Salem.

Interborough Rapid Transit Company, New York, N. Y.—A portion of the new Jerome Avenue line of the Interborough Rapid Transit Company extending from 149th Street and Mott Avenue north to Kingsbridge Road and Jerome Avenue was placed in operation on June 2. Operation has also been begun on a portion of the Seventh Avenue subway from Thirty-fourth Street to Forty-second Street, where transfer can be made to the old subway. The new line also provides a rapid transit route by transfer between the Grand Central and the Pennsylvania Railroad stations.

Shelby Northern Railway, Shelby, N. C.—This company has awarded a contract to the Cleveland Construction Company of Shelby for the construction of its line from Shelby to Casar, via Fallston, 22 miles. Three frame trestles, total length 700 ft., will be erected in connection with the line. J. A. Vandegrift, Shelby, general manager. [Dec. 19, '14.]

Scioto Valley Traction Company, Columbus, Ohio.—Arrangements are being made by the Scioto Valley Traction Company to rebuild the light and power distributing system in Kingston. Material for the work, it is understood, has been purchased.

Mansfield Public Service & Utility Company, Mansfield, Ohio.—It is reported that improvements will probably be made on this company's lines in the near future.

Brantford (Ont.) Municipal Railway.—A committee has been appointed by the City Council of Brantford to interview the commission in charge of the Brantford Municipal Railway in connection with the proposed extension of the line into the Terrace Hill district.

Port Arthur (Ont.) Civic Railway.—An order has been placed by the Port Arthur Civic Railway for 250 pairs of continuous rail joints for 80-lb. A. S. C. E. section, to replace the present straight angle bars on its line on Main Street from Arthur Street to Bay Street.

Toronto (Ont.) Railway.—The Board of Control recently adopted the report of Commissioner Harris recommending the city to pay $10,000 toward the new car line to be built at Ashbridge's Bay, east of Cherry Street. The new line is for the benefit of the employees of the Imperial Munitions Board in the new plant which is being erected at Ashbridge's Bay. The total cost of the line will be $185,000, the bulk of which will be borne by the railway company and the Harbor Board. It is expected that the road will be ready for operation by July 15.

Southern Pennsylvania Traction Company, Chester, Pa.—Work has been begun by the Brubaker Paving Company, Huntington, W. Va., on the reconstruction of the tracks of the Southern Pennsylvania Traction Company from Saville Avenue, Chester, to Darby.

Conestoga Traction Company, Lancaster, Pa.—Plans are being made for extensions and improvements to this company's property at Lancaster.

Montreal (Que.) Tramways.—It is reported that the Mayor has approved the construction of a line to the top of Mount Royal. Plans will be prepared by the city engineer.

Dallas Northwestern Traction Company, Dallas, Tex.—Grading will be begun at once by the Standard Utilities Construction Company on this company's proposed line from Dallas to Slidell, via Denton. The right-of-way has been surveyed from Dallas to Slidell. [May 12, '17.]

SHOPS AND BUILDINGS

City Light & Traction Company, Sedalia, Mo.—This company has completed a 1200-ton storage plant in connection with its ice-making plant.

Piedmont & Northern Railway, Charlotte, N. C.—A contract has been awarded by the Piedmont & Northern Railway to the Fiske-Carter Construction Company, Greenville, for repairing its freight station at Greenville, recently damaged by fire.

Northwestern Pennsylvania Railway, Meadville, Pa.—The carhouse of the Northwestern Pennsylvania Railway at Meadville, containing fifteen cars, was recently destroyed by fire. The loss is estimated at $80,000.

POWER HOUSES AND SUBSTATIONS

Fort Wayne & Decatur Traction Company, Decatur, Ind.—Plans have been prepared by the Fort Wayne & Decatur Traction Company for the erection of a substation, 23 ft. x 60 ft., in Decatur.

Columbus, Delaware & Marion Railway, Cincinnati, Ohio.—This company plans to make additions to its power plant, doubling its capacity.

Eastern Texas Electric Company, Beaumont, Tex.—An addition is being built to the Port Arthur power station by the Eastern Texas Electric Company. A new 4000-kw. turbo-generator will be installed.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Reducing the Selling Cost

Accessory Manufacturer Seldom Comes in Contact with Purchasing Agent—Mechanical Department Should Keep Manufacturers' Literature

BY L. W. HORNE
General Manager Horne Manufacturing Company, Brooklyn, N. Y.

With reference to an article which was published in the April 14 issue, page 720, giving my views on selling costs, I have noted with interest the comments pertaining to this subject by W. V. C. Buckeley, purchasing agent of the Columbus Railway, Power & Light Company, and E. C. Johnston, purchasing agent of the East St. Louis & Suburban Railway.

It is evident from the articles of the two officials above mentioned, which appeared in the issues of May 5 and May 12 respectively, that purchasing agents in general are paying more attention to the art of purchasing than officials of the mechanical department. This is only natural, as they make a specialty of this phase of the railway company's business. The writer and other representatives of this company seldom come in contact with the purchasing agents, and it was therefore my primary intention to direct my original remarks to the officials in charge of the mechanical department.

The majority of the devices manufactured by this company are specialties, generally purchased in conjunction with new cars. It is in connection with specifications on new cars that we find our selling expense to be high, and it is difficult to say whether any real remedy will ever be found. For instance, a road is reported to be ready to purchase new equipment. We try not to bother the company until details of car bodies, trucks, motors and air brakes, which constitute the vital items, have been decided upon. We then call their attention to our specialties. This subject is handled by the master mechanic if the road is a large one, or by the general manager if the road is small. Frequently, after the specifications are decided upon the purchase of the cars is postponed for many months, and in some cases more than a year. When the railway company is ready to place the order for cars it is necessary for the manufacturer to go over the entire subject again with the railway official in charge. After the car builder has been selected the supply house must then concentrate a third effort on the car builder in order to obtain the order for the material specified as quickly as possible, as competitors will naturally continue to work with the railway company in order to get the specifications changed, during the period that the car builders are making ready to construct the cars.

In regard to renewals or repair parts for our specialties, we find that our bulletins are often mislaid in the master mechanic's office, because this official frequently has not proper facilities for filing. As all of these special parts are specified by the mechanical department, the purchasing agents must rely upon that department for information as to the manufacturer, part numbers, etc. There is a device that we manufacture which has been on the market for the past eighteen years. A certain company desired repair parts for this device but was unable to locate the manufacturer. It then made up pattern equipment at a cost of $50, and made a few castings from the pattern in order to keep its cars in service. These parts could have been purchased from us for $3 each.

It is possible that I have been too frank in discussing this subject, but I am trying to obtain better recognition for the manufacturer of railway specialties, and am urging that more attention be paid to catalogs and other printed matter sent for the information of officials of the mechanical department.

Not All the Fault Lies with the Manufacturer

Railroads Should Be Accurate and Specific When Placing Orders—Packing and Shipping Instructions Important

Charles Christopher, storekeeper of the San Francisco-Oakland Terminal Railways, is not inclined to place all of the blame for misunderstood orders, misrouted shipments and delayed deliveries upon the shoulders of the manufacturer. The adage that "The customer is always right" really is unjust, he says, in many instances.

Despite the long distance to Oakland from most of its supply companies and despite a badly unsettled market, Mr. Christopher has few complaints to make about service or deliveries. Of 15,000 items kept in stock, he was short only eighty-six when interviewed on April 30. Even these items were not needed for thirty or sixty days, as they had been put down on the "short" list when the requisition for the last pieces in stock had been filled. So satisfactory a condition could be due only to a most careful watch of demands upon the stockroom.

Mr. Christopher said that if railways wanted prompt service they should make it a point to order things by the manufacturers' catalog numbers and use the manufacturers' names for the articles desired. Further, they should give precise packing, rating and routing instructions. For example, if castings are ordered sent in barrels or boxes, the rate will be less than if they are sent wired together; and, again, the weight of the shipment often is a deciding factor as to whether freight or express transportation should be chosen. It is unfair to the manufacturer to order blindly and then hold him at fault for errors. The fundamental trouble is that many railways look upon the storekeeper and his assistants as mere counters, weighers and checkers. A good stock man can save his company thousands of dollars annually because of his specialized knowledge of markets and transportation, and this entitles him to a position above that of a simple clerkship.

Incidentally, it may be added that a surprise visit to the storerooms of the San Francisco-Oakland Terminal Railway revealed one of the best-kept plants in the country. Even such minor parts as bolts and nuts are neatly stacked instead of being thrown into the bins. A framed typewritten card over each compartment gives an entirely adequate description of the contents.

Don't Set Your Own Standards

Middle Western Purchasing Agent Questions Big Companies Suggesting Their Own Particular Size of a Catalog as a Standard

BY S. S. DUNBAR
Purchasing Agent Union Traction Company of Indiana,
Anderson, Ind.

The article by Mr. Rice of the General Electric Company, appearing in the issue of April 28, page 808, and the facts given in the issue of May 5, page 854, from various companies regarding the so-called standard sizes of catalogs, are illuminating, if anything can be illuminating which indicates such dark prospects in the way of the adoption of standard sizes of catalogs. Mr. Rice takes the very general attitude of many individuals in practically stating that the General Electric Company is in favor of a standard size of catalog, provided its standard size is adopted; and the same idea is voiced in the extracts from the expressions quoted from other advertising managers for large companies. It might be suggested that the Technical Publicity Association line up some of the larger members.

Mr. Rice indicates that the paper manufacturers should make sizes satisfactory to the standards of the buyer, but it is desirable that smaller manufacturers use standard sizes as well as the big fellows, and the small manufacturer certainly cannot order printing in large enough quantities to have the paper made to order. The 8½-in. x 11-in. catalog page will cut from an existing standard size adopted by the paper mills. The great majority of people use this size, and it is convenient and of good appearnce. If the size is reduced ½ in. each way, *i.e.*, to 8 in. x 10½ in., and the same margin is retained (and often a large margin is used with the smaller size sheet), there is less writing space on the smaller sheet by a great deal more than the 10 per cent which Mr. Rice points out as being saved in using the 8-in. x 10½-in. size in place of the 8½-in. x 11-in. size.

It has not been the idea of the writer to argue for the 8½-in. x 11-in. size particularly, but if every man says a standard is all right so long as you adopt "mine," we shall not get any standard. It is hoped that this matter will be kept alive until some results are obtained.

Westinghouse Gross and Net Increase

Completion of Munition Orders Contributed Largely to Result, but Sales Billed and Net Income for Regular Products Showed Big Increases

The income statement of the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., for the year ended March 31, 1917, follows:

Gross earnings sales billed	$89,539,442
Cost of sales	72,077,751
Net manufacturing profit	$17,461,690
Other income	1,386,546
Gross income from all sources	$18,848,237
Deductions from income	768,348
Net income available for dividends and other purposes	$18,079,888

The gross earnings and net income for the year were greatly in excess of any previous year in the history of the company. The completion of large orders for munitions contributed largely to the results for the year, although sales billed and net income for the regular products showed large increases over any preceding year. The amount of taxes—federal, state and county—paid or accrued during the year was in excess of $2,000,000. The value of unfilled orders on March 31, 1917, for the regular products was $39,776,739, as compared with $22,097,995 on the same date of last year.

The net income for the year was $18,079,888.83, thereby increasing the surplus of $9,246,707.03 as of March 31, 1916, to a gross surplus of $27,326,595.86. Dividends were declared for the full year at the rate of 7 per cent per annum upon the preferred stock and upon the common stock at the rate of 6 per cent for the first and second quarters and at the rate of 7 per cent for the third and fourth quarters. For the purpose of increasing the reserve account, the sum of $5,000,000 was appropriated from surplus. The net surplus as of March 31, 1917, was $18,105,298 as compared with $9,246,707 on March 31, 1916.

The property and plant account showed a net increase during the year of $1,499,805. Depreciation of buildings and equipment and expenditures for extensions, renewals and betterments of plant and equipment was written off during the year to the amount of $6,473,066. Investments in other companies increased during the year $2,493,825, which chiefly represents additional shares of the Electric Properties Corporation and Canadian Westinghouse Company acquired during the year.

By the sale in February, 1917, of $15,000,000 additional common capital stock and the conversion of over $3,000,000 of bonds, the total outstanding capital stock was increased during the year to $74,812,650. The balance, $2,247,000 of the convertible sinking fund 5 per cent gold bonds issued in 1915, outstanding on Oct. 1, 1916, were called for redemption on Jan. 1, 1917. All but $71,000 face value of these bonds were converted into common stock, par for par, before the redemption date.

The annual report states that with the exception of the contracts with the British Government for the manufacture of Russian military rifles which are being carried out by the New England Westinghouse Company under a modified contract, the company has no uncompleted munitions contracts for foreign governments on its books, all such contracts having been completed or canceled.

Handling Sales in the Orient

American Salesman After Long Trip Recommends Foreign Sales Be Handled Through Export Houses

James G. Drought, Chicago sales manager of the U. S. Graphite Company, has just returned from an eight months' trip through the Orient, where he visited Japan, China, the Philippines, Russia and Hawaii for the purpose of promoting the sale of his company's motor and generator brushes. When interviewed as to suggestions which might be of interest to other manufacturers who received inquiries from traction properties in the far East, Mr. Drought made the definite statement that the best mehod of handling individual sales would be through some of the large special organizations which make a business of importing supplies for the Oriental trade. There are large distributors, some with offices in New York, who are well equipped with staffs of engineers and salesmen in the far East. The problem for the American manufacturer, particularly the one with a limited foreign trade, is greatly simplified after he has made working relations with one of these well-established organizations. Most of these organizations have branches or correspondents in New York, and the American manufacturer can lay the goods down in New York and receive his money without the work, worry and risk of making foreign deliveries.

Effect of War on Carbolineum Business

American Manufacturers of Carbolineum Grades of Wood Preservers Fulfill Trade Requirements

By E. E. Pershall

General Superintendent Kettle River Company, Minneapolis, Minn.

One of the largest benefits gained by American industry from the world war is the enforced development of the manufacture of certain commodities heretofore not produced in a large way in this country. Carbolineum grades of wood-preserver oil offer a notable example. Until three years ago the manufacture of these oils for wood preservation was confined largely to Germany, and German oils dominated the American market. However, the cessation of German exportation with the beginning of the English blockade gave the American users prospects of a German carbolineum oil famine. But the American manufacturers, recognizing the opportunity which the situation afforded, immediately commenced the production of the carbolineum grades of creosote oil, and to-day the American oils fulfill the requirements of the trade both as to quality and quantity.

One of the reasons why the German oil was so well established in America was its alleged secret process of manufacture. The oil was said to include chemicals compounded by secret processes known only to the Germans. Americans then engaged in the wood-preserving business found it more profitable to act as local representatives for German agents than to attempt to compete.

Exposing the German Claims

The German claims were known to our chemists to be part of clever sales schemes. The United States government tests had proved the perfect wood preserver to be the high boiling creosote oil distilling above 300 deg. C., providing that the oil was a pure coal-tar distillate. There was nothing mysterious or unusual about either the formula or the coal. Experts knew that America had the proper coal.

The foreign-trade conditions in 1914 gave us a chance to find a market for American oil. All shipment of German carbolineum wood-preserving oil to this country had been stopped. This was our opportunity, and we at once erected stills and other machinery used in the production of the German carbolineum grade of wood-preserving oil. Since 1914 carbolineum grades of oil have been manufactured which pass the specifications prescribed by the United States Signal Service and the United States Navy.

THE AMERICAN OIL

We have had no trouble in finding a market, and if we had not been able to manufacture this oil the American trade would have found itself facing a wood-preserver famine. Instead of embarrassment because of a lack of oils fair deliveries for three years have been given by a well-organized sales department. Our trade-marked oil is known as "K-R-Wood Preserver." I do not think that German oils will ever again be able to compete seriously in the American market.

British Westinghouse to Be Controlled in England

By resolution of stockholders the control of the British Westinghouse Electric & Manufacturing Company is to pass from America to a group of capitalists in Birmingham, England. This change is made as the result of the policy of British industry to become independent of foreign capital control. The American interests, it is said, have no desire to part with their holdings, but they appreciate the reasons for the change. They will retain a minority interest in the British company.

The control will pass under an option given last December. Since under British law a company cannot buy its own shares, a holding company is being formed to buy the shares and debenture stock held in America, the price to be paid being approximately £1,250,000 in first lien 5 per cent bonds and £100,000 in ordinary shares for an original investment said to be £1,820,000. The ordinary-share provision gives the American interests half the profits of the holding company beyond 6 per cent. The return to them under the new plan, it is reported, will be the same as at present. Through purchase of securities of the British company by the new holding company, about £750,000 of new capital is to be secured by the former.

NEW YORK METAL MARKET PRICES

	May 3	June 9
Prime Lake, cents per lb	31	32½
Electrolytic, cents per lb	31	32½
Copper wire base, cents per lb	36	36
Lead, cents per lb	9⅞	11½
Nickel, cents per lb	50	50
Spelter, cents per lb	9½	9¾
Tin, Straits, cents per lb	58½	60¼
Aluminum, 98 to 99 per cent, cents per lb	60	63

OLD METAL PRICES

	May 3	June 9
Heavy copper, cents per lb	24½	28
Light copper, cents per lb	21½	25½
Red brass, cents per lb	18½	19½
Yellow brass, cents per lb	17½	18
Lead, heavy, cents per lb	7¾	8¾
Zinc, cents per lb	7	7
Steel car axles, Chicago, per net ton	$41.50	$42.50
Iron car wheels, Chicago, per gross ton	$24.00	$34.00
Steel rail (scrap), Chicago, per gross ton	$31.50	$37.50
Steel rail (relaying), Chicago, per gross ton	$39.00	$42.50
Machine shop turnings, Chicago, per net ton	$11.00	$15.50

CURRENT PRICES FOR MATERIALS

	May 3	June 9
Rubber-covered wire base, New York, cents per lb.	36½	36½
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable stranded, New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40.00	$40.00
Rails, heavy Bessemer, Pittsburgh, per gross ton.	$38.00	$38.00
Wire nails, Pittsburgh, per 100 lb	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb	$3.85	$4.00
Steel bars, Pittsburgh, per 100 lb	$4.00	$4.25
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$6.35	$6.90
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$7.55	$8.55
I-beams over 15 in., Pittsburgh, cents per lb	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$4.15	$4.15
Cement (carload lots), New York, per bbl	$2.12	$2.40
Cement (carload lots), Chicago, per bbl	$2.16	$2.31
Cement (carload lots), Seattle, per bbl	$2.60	$2.60
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.21	$1.21
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.22	$1.22
White lead (100 lb. keg), New York, cents per lb.	10¾	11¾
Turpentine (bbl. lots), New York, cents per gal.	52	44

ROLLING STOCK

Wisconsin Electric Railway, Oshkosh, Wis., is reported to be in the market for ten city cars.

Union Street Railway, New Bedford, Mass., is reported to be in the market for six cars.

Gary & Interurban Railroad, Gary, Ind., through Ford, Bacon & Davis, has purchased two motor and four trail cars from the McGuire-Cummings Company.

Terre Haute (Ind.) Electric Traction Company on May 21 had one car completely destroyed by a fire which started in its local carhouse.

Cincinnati (Ohio) Traction Company is reported to have placed an order with the Cincinnati Car Company for 100 cars.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, is reported to have purchased four cars from the Cincinnati Car Company.

Trenton & Mercer County Traction Company, Trenton, N. J., has received permission from the Public Utility Commission to sell twenty old summer cars.

Nipissing Central Railroad, North Cobalt (Ont.), Canada, has purchased three second-hand cars from the East St. Louis, Columbia & Waterloo Railway, East St. Louis, Ill. These are 50-ft. interurban cars and will be used until new equipment can be ordered and built.

Saskatoon Municipal Railway, Saskatchewan, Canada, is in the market for three single-truck double-end cars. The cars desired are 33 ft. long over all with a seating capacity of thirty-two passengers. The equipment per car wanted includes two 40-hp. motors, controllers, hand brakes, center aisle reversible cane seats, forced-draft heaters, etc. The weight of each car should not exceed 35,000 lb.

Worcester (Mass.) Consolidated Street Railway, noted in the May 5 issue as being in the market for a number of cars, has specified the following details on seven box express cars:

Number of cars ordered,	4 Motor, 3 Trailer
Date order was placed,	May 19, 1917
Date of delivery	Nov. 15, 1917
Builder	Osgood-Bradley
Type	Box express
Weight (total)	28 tons
Bolster centers, length,	26 ft. 6 in.
Length over bumpers	45 ft. 0 in.
Length express compartment,	35 ft. 8½ in.
Width over all	8 ft. 4⅞ in.
Rail to trolley base,	11 ft. 7¾ in.
Body	Semi-steel
Interior trim	Sheathed inside
Roof	Arch
Air brakes,	G.E. straight and automatic
Axles	Forged Steel
Bumpers	Rico anti-climbers
Control, type	K-35-G-2
Designation signs,	Ill., "Freight"
Couplers	Tomlinson MCB
Fenders or wheelguards	Pfingst
Gears and pinions,	Forged steel, heat-treated
Hand brakes,	Horne double acting (Motor) Blackall vertical staff, (Trailer)
Heaters	Electric
Headlights,	Crouse-Hinds "Melobeam"
Journal boxes	Symington
Lightning arresters,	Westinghouse
Motors	Four West. No. 306-CV, inside hung
Enamel	Sipes' Enameloil
Sanders	Murphy
Retrievers	Wilson No. 2
Trolley base	U. S. No. 13
Trolley wheels,	Railway standard
Trucks	Wason, arch-bar
Ventilators	None
Wheels	33-in. cast iron

Northern Ohio Traction & Light Company, Canton, Ohio, which is having twenty-five vestibuled pay-within cars built for it by the St. Louis Car Company, has specified the following details:

Number	25
Builder	St. Louis Car
Type	Vestibuled pay-within
Seating capacity	40
Weight (total)	36,840 lb.
Truck centers, length	19 ft. 0 in.
Length over bumpers	41 ft. 4 in.
Length over vestibule	40 ft. 4 in.
Width over posts	8 ft. 2 in.
Height, floor to ceiling,	7 ft. 6 in.
Height, sill to trolley base,	8 ft. 5¼ in.
Body	Steel sides with wooden superstructure
Interior trim,	Honduras mahogany
Headlining	3/16-in. Agasote
Roof	Turtle-deck
Underframe	Steel
Air brakes	Westinghouse
Axles	St. Louis Car
Bumpers	Rico anti-climbers
Car trimmings	Bronze
Cables	St. Louis Car
Conduits	St. Louis Car
Control, type	GE. K-35
Couplers,	St. Louis Car, Hovey type
Curtain fixtures	Forsyth No. 88
Curtain material,	Pantasote No. 77
Designation signs,	Illuminated, St. Louis Car E. S. S. Co. mechanism
Door mechanism,	Hand-operated, St. Louis Car
Fenders	Railway company's, standard
Gongs	12-in., bronze pneumatic
Hand brakes	Ackley
Hand straps,	Rico sanitary straps
Heaters	Peter Smith No. P-S
Headlights	Crouse-Hinds
Journal boxes	St. Louis Car
Motors	Two GE. 204—outside hung
Paint	Murphy A B C
Registers	International R-5
Sand-box	with Reliance sand trap valve
Sash fixtures	O. M. Edwards
Seats	Cross and longitudinal. Hale & Kilburn
Seating material	Rattan
Springs	Pittsburgh Steel Spg.
Step treads	Mason
Trucks	St. Louis Car 106A maximum traction
Ventilators	Automatic
Wheels	33-in. driver, 21-in. pony
Special devices	Faraday buzzers

PROFESSIONAL NOTE

John A. Beeler, consulting engineer, who has been located for the past year at 60 State Street, Boston, has moved his headquarters to the Vanderbilt Concourse Building, 52 Vanderbilt Avenue, New York City. While in Massachusetts he was engaged upon a number of important investigations and reports for the Bay State Street Railway and other companies. Mr. Beeler was formerly vice-president and general manager of the Denver Tramway System, and while with this company he demonstrated his ability to instill enthusiasm and develop the loyalty of his employees to a remarkable extent. Although there was a large number of men on the property, no strikes or labor troubles arose during his management of twenty-five years. The employees were made to realize that their prosperity was dependent upon the success and prosperity of the company. The result was a most courteous, polite and painstaking lot of men who by their bearing and treatment of the patrons established a friendly relation between the public and the company, much to the latter's benefit in every way. Mr. Beeler's experience as a constructing engineer and successful manager especially qualifies him to render valuable service where a practical solution of operating problems and difficulties are involved.

TRADE NOTES

A. M. Collins has been appointed sales manager of the Detroit office of the Western Electric Company.

Draeger Oxygen Apparatus Company, Pittsburgh, Pa., has moved from Pittsburgh to Penn Avenue and Hay Street, Wilkinsburg, Pa.

Ollard Trolley Wheel Company, Tacoma, Wash., has been incorporated with a capital of $20,000. The company will manufacture trolley wheels.

Van Dorn & Dutton Company, Cleveland, Ohio, has opened a branch office at 524 Wells Building, Milwaukee, under the management of James Gibbons, formerly manager of the Baltimore branch.

United States Electrical Manufacturing Company, Los Angeles, Cal., is putting out a new electric grinding motor, fully inclosed and provided with ball bearings. It can be supplied for bench mounting or with a special pedestal.

H. W. Johns-Manville Company, New York, has moved its Pittsburgh showrooms and sales offices to the ground floor of the Westinghouse Building, corner of Ninth Street and Pennsylvania Avenue.

Walter A. Zelnicker Supply Company, St. Louis, Mo., announces that it has secured the services of Charles H. Trapp. Mr. Trapp was formerly associated with James Stewart & Company of St. Louis and also with Terrell Croft, consulting electrical engineer, St. Louis.

Wagner Electric Manufacturing Company, St. Louis, Mo., announces the appointment of F. T. Coup, formerly connected with its Chicago office, to take charge of its Milwaukee office in its new location, the First National Bank Building.

George W. Goethals announces his association with Charles C. Jamieson, Robert E. Graham, George H. Houston, John C. Jay, Jr., and George M. Wells, consulting engineers, 40 Wall Street, New York. The name of the company will be Goethals, Jamieson, Houston & Jay, Jr.

E. C. Woodbury, for a number of years with the Standard Underground Cable Company as assistant to the manager, has resigned from that company to manage the Southwestern business of the Belden Manufacturing Company of Chicago.

Ohio Brass Company, Mansfield, Ohio, has received an order through a New York export house for overhead materials amounting to approximately $10,000. The materials will be used in rehabilitating the properties of the Mexico Tramways, Mexico City, Mexico.

Asbestos Protected Metal Company, Pittsburgh, Pa., announces the temporary closing of its Atlanta and St. Louis offices. This has been made necessary because J. R. Nichols, Atlanta manager, entered the Officers' Reserve Corps at Fort McPherson and F. C. Easterby, St. Louis manager, entered the Officers' Reserve Corps at Fort Riley, Kan.

Underwriters' Laboratories, Chicago, Ill., announce as additions to their casualty council the following: Col. Lewis T. Bryant, Commissioner of Labor of the State of New Jersey, Trenton, N. J.; Lew R. Palmer, Department of Labor and Industry, Harrisburg, Pa., and A. H. Young, director of the American Museum of Safety, New York.

Bridgeport (Conn.) Brass Company has extended to its employees a liberal plan for the purchase of Liberty bonds. It will carry the subscription of any individual in its employ for fifty months, that is, the employee may pay for his bond in instalments of 2 per cent per month of the value of his subscription. In addition the company has made a large subscription in its own ame.

Monitor Controller Company, Baltimore, Md., manufacturer of automatic starters and controllers for all kinds of motor-driven machinery, announces the opening of a new office in Buffalo, N. Y., at 718 Ellicott Square, under the direction of William G. Merowit. This office will have charge of business in the western New York territory, also Canadian territory adjacent to Toronto and Hamilton.

Railway Safety Device & Manufacturing Company, Parsons, W. Va., has been incorporated with $100,000 capital to manufacture locomotive spark arresters, safety mail cranes, and other railway specialties. The corporation was formed by Frank M. Glenn and Otis A. Miller of Parsons, Robert E. Jackson and Everett G. Livesay of Princeton, and J. A. Visquesney. The corporation has purchased 10 acres of land as a site for a foundry.

Sangamo Electric Company, Springfield, Ill., announces the opening of a San Francisco office at 37 Stephenson Street, in charge of L. A. Nott, district manager. This office will represent the Sangamo company in northern California and that part of southern California not handled by the Sangamo company's Los Angeles office. Mr. Nott is well known to the electrical fraternity on the Pacific Coast, having been connected with the Standard Underground Cable Company for many years and later with the K. P. F. Electrical Company, which association he will continue. The Sangamo company will now carry a complete stock of meters, repair parts, etc., in San Francisco, and will be prepared to service its meters in this territory. The Los Angeles and southern California district office in the San Fernando Building, Los Angeles, will continue under the direction of J. C. Monahan, district manager.

ADVERTISING LITERATURE

Van Dorn & Dutton Company, Cleveland, Ohio: A folder. "Three Trumps," referring particularly to its gears, electric tools and weldless wire chains.

Dayton (Ohio) Manufacturing Company: Catalog No. 213, describing and illustrating the latest patterns of washstands, water coolers and water and dry closets.

National Tube Company, Pittsburgh, Pa.: Classification and list adopted on June 1 on the cost of black and of galvanized malleable iron fittings made by this company.

Pennsylvania Metallic Tubing Company, Chicago, Ill.: A thirty-two-page bulletin describing and illustrating the various uses of Penflex metal hose. Contains tables giving data on vacuum tubing, fireproof tubing for light pressures and tubing for high pressures.

Crouse-Hinds Company, Syracuse, N. Y.: Catalog No. 201, 116 pages. Includes ten different types of Imperial luminous arc headlights and eleven Imperial carbon-arc headlights for electric traction service, headlights for harbor and river service, headlights for electric mine locomotives and wiring equipment, supply parts and wiring diagrams for all of the above-named headlights. Also catalog No. 202 on Imperial incandescent headlights for railway and mining service, including six types each with regular filament Mazda lamps for city service, eight types for city and interurban service and seven types for high-speed interurban service. Wiring diagrams, wiring equipment parts, and numerous catalog number indexes for all the above headlights are given.

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AIR SUPREMACY CHEAP AT HALF A BILLION

The rapid advance which the airplane has made mechanically within the last two years is ample warrant for the recent proposal at Washington to appropriate $500,000,000 for the immediate construction of an overwhelming number of machines. This is the first move in developing a gigantic American air service. Aeronauts are the eyes of an army and the principal means by which its artillery fire can be efficiently directed. If the Allies can win the mastery of the air by a vast preponderance of airplanes and flyers, not only can they greatly diminish the effectiveness of the enemy's artillery, but they can attack strategic points at a considerable distance in his rear. The construction of an airplane engine differs considerably from that of an automobile, as lightness for the horsepower developed is a prime necessity, and airplane engines must be capable of developing their maximum power continuously over long periods as well as operate successfully at greatly varying altitudes. Nevertheless, with the resources for manufacturing automobile engines possessed by this country, the construction of 50,000 airplanes, which is the number being considered, ought not to be a great task. A number of our readers are gas-engine specialists, and we commend their support to this movement. In fact, we can conceive nothing more important than that the Sheppard-Hulbert bill will pass Congress, and pass at once. It is one of the most practical means for hastening the end of the war that has yet been put forward.

TAKING ADVANTAGE OF ECONOMY KINKS

One of our superintendent-of-rolling-stock readers insists that the mechanical men over the country are losing thousands of dollars a year for their companies because they do not take advantage of the ideas presented in our columns for effecting economies in the maintenance of equipment. He never hesitates, he says, to put into use anyone's kink which will fit his conditions and make for reduced operating costs in the mechanical department. He watches the "Equipment and Its Maintenance" department of the JOURNAL as he would the stock quotations if he had a thousand shares of Bethlehem steel. The fact that someone else conceived an idea does not cause him to hesitate to take advantage of it, for if it will reduce his department costs that will be a feather in his cap sufficiently bright to offset some sacrifice in personal pride because the idea originated with another. This is why we are making every effort to supply the industry with all the kinks which are developed, and any master mechanic who fails to note these carefully and to size them up for application in his own shop is missing a good thing, and is not doing himself justice or giving his best to his company. When opportunities of this sort are laid on a man's desk every week, should he not be alert to his responsibilities in these days of high operating costs and "grab" every economy kink? Many mechanical men do, but some, we fear, fail to see this very practical opportunity.

DISPLACING THE ISOLATED PLANT

The old saying about it being an ill wind that blows no one good appears to be applicable to the present fuel situation, at least as far as some of the railways who sell power are concerned. While the high cost of fuel has been a serious burden to the large consumer it has been an even more serious one to the small consumer. The former, by reason of his greater purchases and better fuel handling and storage facilities, has been able to secure better rates and a larger percentage of his fuel at the old contract prices. Further, as the large consumer ordinarily is better located with respect to transportation systems, he is having less trouble in getting prompt shipments than is the small consumer. Altogether, the way of the small plant during these strenuous days is not a path of roses by any means, and municipalities and other owners of small isolated plants are evincing far more interest in the matter of purchased power than they did in former days. It would seem, therefore, that, for those railway companies which have an assured fuel supply and a schedule of power rates which permits a profit with the present cost of producing energy, now is a most opportune time to build up the power load.

SLACK IN SCHEDULES AND ENERGY INPUT

On another page of this issue there is advanced, in an article by C. H. Koehler, a novel plan for investigating schedules without necessity for any reference to traffic conditions. The basic idea is that, with reasonably satisfactory equipment and operation, the input of energy may be made to measure the "slack" in any schedule by means of a so-called "service-characteristic" diagram. This may appear somewhat formidable because of its inclusion of an interesting paradox to the effect that, when schedules contain no slack, the energy consumption will go down as the speed goes up. The reason for this apparent reversal of the laws of train resistance is plainly that, for city schedules without slack time, the whole of the energy input goes for acceleration, and the only thing that can change the energy input is a change in the number of accelerations (or the number of stops) per mile. Acceptance of this hypothesis leads directly to the important feature of the theory involved, which is that a certain schedule speed for a certain equipment means a certain practical maximum energy consumption, this maximum being at the point where no slack, or spare time for coasting, is provided. No more power can then be used unless the motorman does absurd things with his controller and brake. If less energy than this is found to be consumed in actual service the difference between the two figures serves as a definite measure of the margin (or slack) between the actual and maximum schedule speeds. Therefore, to determine whether a schedule is too high or too low, it is unnecessary to make an exhaustive investigation of the number of stops and their duration. Instead, only a knowledge of the actual energy input per car-mile is required. Thus there is eliminated at one stroke that bugbear of all transportation problems—the indeterminate and highly elusive factor of stops per mile. It will be interesting to see the proposed new method applied in practice to a congested railway system.

SAVING FUEL IS A PATRIOTIC DUTY

In the issue of this paper for June 2 we directed attention to the magnitude of the possible saving in coal which could be made by careful attention to the matter all along the line from coal pile to brakeshoe. Our estimate of the coal consumption in electric railway power plants at about 9,000,000 tons per annum has been confirmed for us by estimates made since the publication of that editorial by the director of the United States Geological Survey, Dr. George O. Smith. Dr. Smith says, "Your figure seems to be as fair as any which could be worked out from statistics now available." The electric railways, which are large producers and still larger consumers of electrical energy, should lead the way in practising all possible economy without prejudice to good service.

The pressing need of the government and the country in general for fuel, combined with the high prices of steam coal, furnish together an extraordinary incentive for economy. Of timely interest, therefore, is the suggestion of Secretary Franklin K. Lane of the Department of the Interior that water power be utilized to the maximum possible extent in electric power plants. While it is probable that, in the interest of ordinary economy, electric railways depending in part upon water power for their energy supply are utilizing this to the maximum extent, there may still be some possibilities of fuel saving in this direction. Co-operation in a given locality, for example, might result in tying together a number of plants normally independent and thus enabling them to utilize more fully the total water power in the combined system.

At the time of the preparation of the latest available census report the capacity of water-power units in electric railway power plants was about 13 per cent of the total, and it was then increasing. The recent rapid development of the steam turbine, however, has reduced the attractiveness of water power, so that we do not look for any great increase in this percentage. We are glad, however, to pass along Secretary Lane's suggestion in the hope that the use of available water power may be to some extent increased at this time, even if this is not the most economical procedure when judged by ordinary engineering standards.

CAR DEPRECIATION

What is the life of an electric car? This question comes to the foreground almost every time the matter of fixed charges on rolling stock is being discussed. And the fixed charges question should come up every time it is proposed either to buy new rolling stock or remodel old. The interest in car life, of course, is due to the fact that of the fixed charges, depreciation constitutes a most important item. The life question also presents itself in property valuations whether they are for rate adjustment, taxation or fixing a fair selling price. The question is complicated by the fact that the different portions of the car equipment do not depreciate at the same rate. It is at present deemed good practice, when the depreciation of rolling stock is being considered, to treat the electrical equipment as separate from the remainder of the car. Our present discussion is limited to this remainder.

The physical life of a car is conditioned by a number of factors, among which may be mentioned type of construction, materials of construction, class and severity of service. The effective life is limited not only by physical deterioration, but also by such other factors as adequacy and obsolescence. As far as actual physical life is concerned, well-maintained rolling stock will last a long while. As noted in our issue for March 3 relative to the Chicago Elevated valuation, the lives, physical presumably, assigned to wooden, composite and steel cars were forty, forty-five and fifty years respectively. The figure for wooden cars would correspond to a straight line depreciation rate of 2.5 per cent since the salvage value of a wooden car is nil. The physical depreciation of steel cars is, of course, less than for wooden ones. But it is not physical deterioration alone that fixes the life of a car. To realize this one has only to pry around a bit in the forgotten and grass-grown nooks of our street railway systems which constitute the "graveyards" of the cars of yesterday. True it is not hard to find twenty-five-year-old cars still doing duty, but an inspection of the cars on our larger urban lines discloses that most of them, to the initiated observer at least, carry the "Built since 1910" sign. Progress in the art of car construction has been so rapid during recent years that the cars formerly operated on these lines have been forced into the remodeling shop, the second-hand market or the "graveyard."

With the above in mind it is interesting to note that the average of eight estimates on car depreciation gleaned at random from utility commission, consulting engineers and operating company reports is 6.8 per cent. This corresponds to a life of approximately fifteen years. As the art of car construction is still far from being in a quiescent state, we wonder if the matters of adequacy and obsolescence are receiving as much weight as they should in estimates of depreciation and rates.

A MESSAGE FROM THE OTHER SIDE

One feature that stands out above all others in several letters and reports which have been received in this office from British sources of highest authority, but which, unfortunately, may not be published as they stand, is the message that we in America must conserve our man-power for military purposes by every possible means. Our ally across the Atlantic has learned this lesson through bitter experience and at a cost that is beyond reckoning. Every British industry, not least among which appears the tramways, has been caught in the maelstrom of reorganization necessitated when whole nations go under arms. Only those who have been through this can realize what it means and what inevitably comes in its wake.

To quote from one of our friends in London, "the great thing for you to bear in mind is that if America organizes an army of millions to make munitions as well as fight in self-defense (or whatever this war may develop into as far as America is concerned) there will be in your country, just as in our country, a great depletion of labor in all industrial circles, including the tramways. Keeping solely to the tramway business and leaving aside all other industries, the one thing that should enter into your calculations is the education of women to fill almost every job now occupied by men. You will have to educate your women first of all to be conductors and then drivers, to be car cleaners and switchboard attendants and operatives of all kinds around the power houses and car sheds. There is practically nothing that men did in the past, in connection with our tramways, that women are not doing now with, perhaps, the single exception of stoking furnaces —and women may even be trained for that before the war is finished. Remember, it takes time to do this, and though you are not suffering from a depletion of men at present, it is possible that you will be in a year's time. If you have no trained women to fill these vacant positions, then the industry must get into trouble. Doubtless the innovation of working women will be opposed as it has been in this country, but you must be prepared for that and must start on a broad campaign of education covering the situation that your country faces. Unless that is done—and done very thoroughly—there will be much obstruction, augmented in your particular case, I have no doubt, by hostile and pacifist elements."

American electric railway companies want to be fully prepared to supply the service which will be needed of them during the war, but the conditions now prevailing are unparalleled in our history. There is nothing in the past of our own country to guide managers in what they should do, because during the Civil War both armies and railways were far smaller than they are in these days. But the message conveyed by the words just quoted is clear enough. Railway companies can well listen to the voice of practical experience from abroad and act promptly upon the advice given.

HIGHER-FARE PROBLEM INHERENTLY SIMPLE

The greater revenue agitation and campaign by the electric railways of the State of New York are gaining momentum under the persistent accelerating force which is being exerted by the committee of ten. One of the things which the campaign is bringing out is the inherent simplicity of the whole proposition, once it is divested of frills and furbelows. If the 5-cent fare was reasonable ten years ago, it should require no argument to prove that it is unreasonable to-day, and this for two reasons. In the first place the service rendered is greater, and in the second place the purchasing power of the nickel is less. That is all there is to it. If the fare could be adjusted in accordance with the law of supply and demand, the railways would have no one to blame but themselves if they could not make ends meet. But as the public controls the situation and, with perfect right, supplants the law of supply and demand with its own sweet will, it is up to the public to be at least as reasonable as that inexorable and ancient law. And it is not a matter of sentiment either. Transportation is a necessity which cannot be had without capital. Now capital is free to obey the law of supply and demand. There is plenty of capital, but it is naturally going where the best combined return and security can be had. Is this in the railway business? Well, no, not under present conditions.

Professor Conway's article this week on the New York situation explains very clearly why this is so. Owing to the neglect of the companies to make a proper depreciation allowance, the present capital is gradually wasting away. Nevertheless, as Professor Conway says, the United States Supreme Court has declared that the maintenance of an adequate depreciation fund is a duty which every public utility owes to its stockholders, its bondholders and to the public. The Public Service Commission of New York, Second District, has adopted a like attitude in at least two cases which have come before it for adjudication, and a similar position has been taken by other commissions. But without adequate income how can a company make this allowance, which the federal court and the state commission declare is part of its obligation to the public?

In Next Week's Issue:

Ivy L. Lee will discuss the necessity
for higher fares on Electric Railways

Several articles on Track Construction and related matters will also appear

Typical Car-Yard Improvements at Rochester, N. Y.

Simplicity, Reasonable Cost, Ample Fire Protection and Complete Utilization of Site Are Features of New Shop and Revised Storage Track Layout at New York State Railways' Portland Avenue Yard

By D. J. GRAHAM
Chief Draftsman Building Department New York State Railways, Rochester, N. Y.

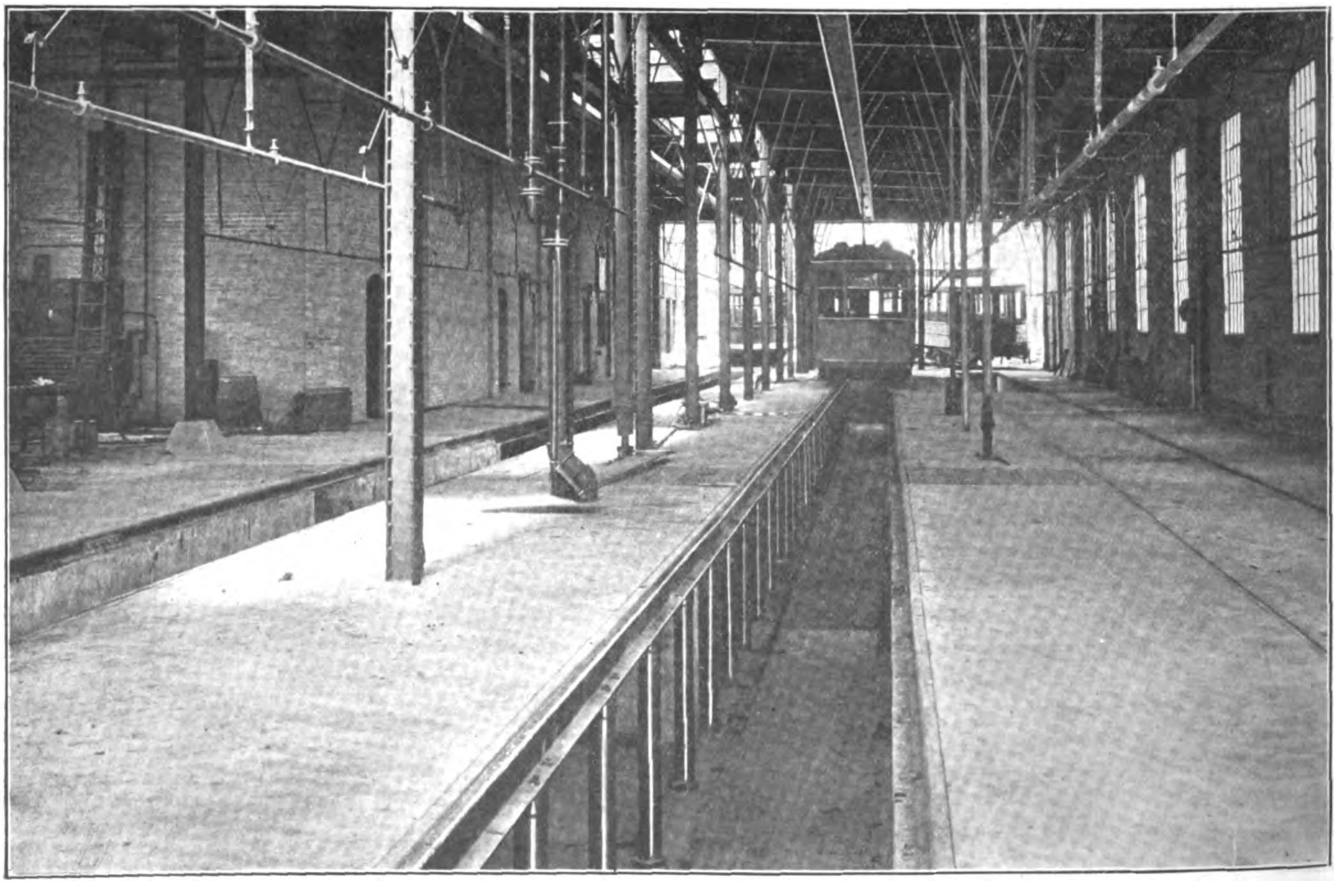
ELECTRIC railways generally are giving a great deal of attention to the layout of yards and shops to facilitate handling of cars into and out of storage, periodical inspection and light repairs. An illustration of this fact was given in the article on car-yard layout in Detroit published in the issue of the ELECTRIC RAILWAY JOURNAL for March 24, 1917. In Rochester we have just completed a part of the contemplated improvements at the Portland Avenue yard. These include a new building for car washing, inspection and ordinary repairs, the addition of more tracks in the yard, and the enlargement and rearrangement of the yard sprinkler system more completely to protect the cars stored in the yard. Typical drawings and photographs have been selected to indicate the details of the improvements. The general layout plan shows also, in broken lines, the outline of a future administration building. The front of this along Draper Street will be of tapestry brick and from the architectural standpoint it will round out the general scheme.

The general layout is designed to minimize the movement of the cars as they are operated through the yard, and the general plan for doing this can be seen in the layout drawing on page 1084. Pull-in cars come into the yard from Portland Avenue and distribute to the several tracks as they are assigned by the car placer. Pull-out cars pull onto the ladder tracks parallel with Concord Street, taking curves either east or west on Draper Street.

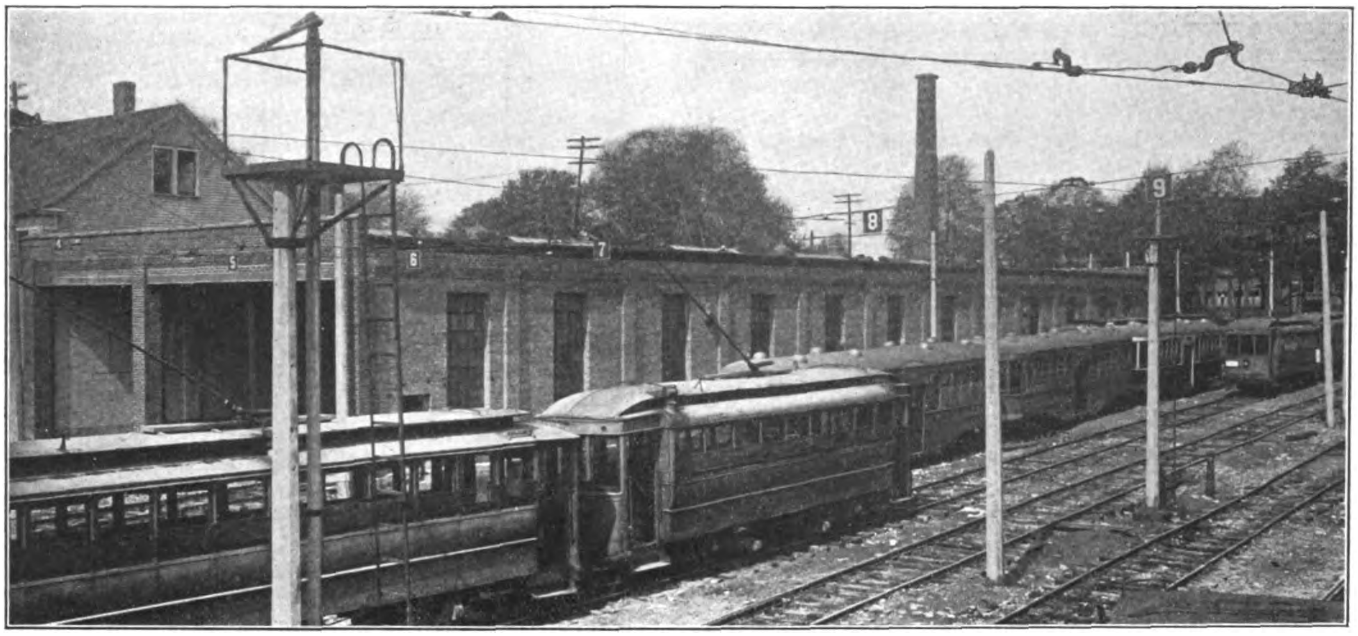
The new repair shop is so located in the layout that there is no interference between yard operation and car repairs. Cars pulling in from the road for repairs take the tracks off Portland Avenue, pulling onto track No. 3 over the inspection pit located at the west end of the shop. After inspection, cars are placed over the pit on track No. 2 for wheel, truck and axle repairs or changes, or over the pit on track No. 1 for motor repairs or changes. The shop accommodates twelve cars over repair pits and wash track.

SPRINKLER NOZZLES COMMAND ENTIRE YARD AREA

The most prominent feature of the yard is the group of monitor nozzles supported on reinforced concrete



ROCHESTER CAR-YARD IMPROVEMENTS—INTERIOR VIEW IN NEW SHOP, SHOWING PIT AND GENERAL BUILDING CONSTRUCTION, AND SPRINKLER SYSTEM



ROCHESTER CAR-YARD IMPROVEMENTS—VIEW IN YARD WITH MONITOR NOZZLE SPRINKLER POLE IN FOREGROUND

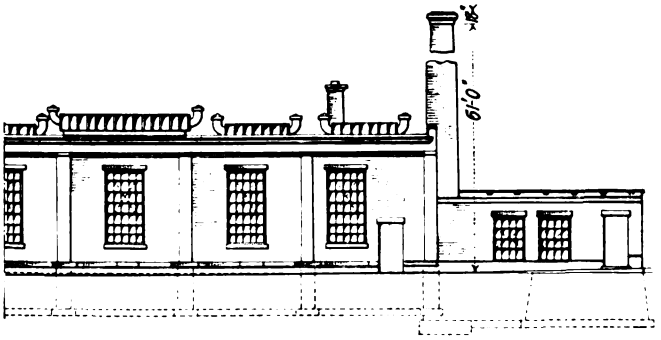
poles 27 ft. long. These are set in concrete foundations 7 ft. deep. These nozzles have 1⅛-in. apertures and of them five were installed in the new part of the yard and three on the north end of the old yard during the present improvements. The complete piping system is shown on the general layout drawing, where the diameters of principal pipes and locations of nozzles and valves are shown. The photograph above shows clearly the nozzle and supporting structure.

Readers who are familiar with the old Portland Avenue yard will note from the drawing that considerable additional property adjacent to it had to be acquired. From this thirteen frame dwelling houses had to be removed, as well as 6570 cu. yd. of sandy loam in connection with the grading.

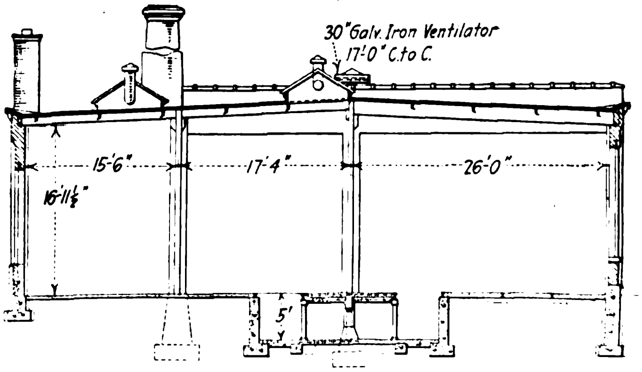
EXCELLENT LIGHTING IS CONSPICUOUS IN THE SHOP

Supplementing the information regarding the shop which can be gathered from the drawings and photographs, attention is directed to the liberal supply of light throughout the shop. Skylights are distributed liberally over the roof. These are of the David Lupton type with rolled steel bars, copper caps and curb aprons of 16-oz. copper. Numerous windows, with Kawneer factory type steel sash, are also provided in the side walls.

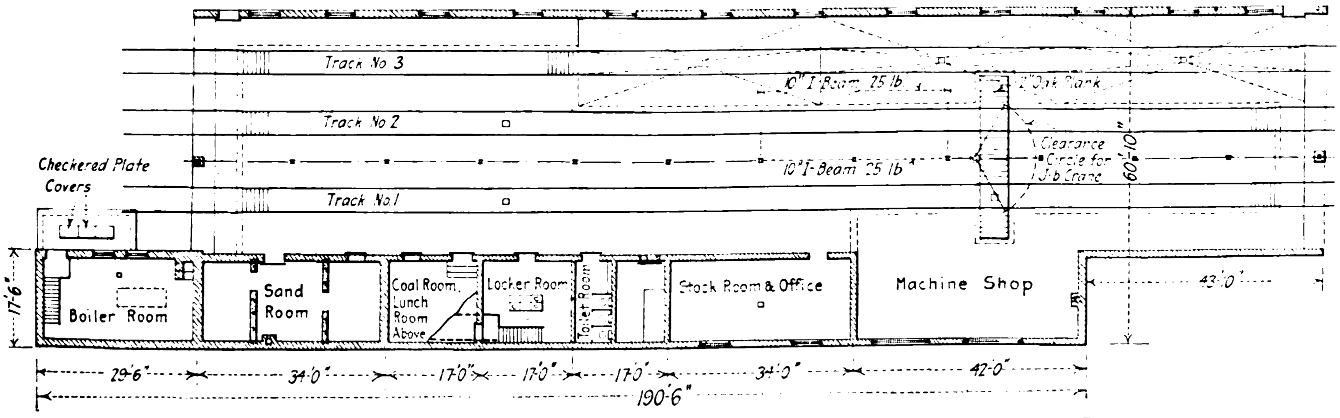
All foundation walls, footings, piers, pit walls and re-



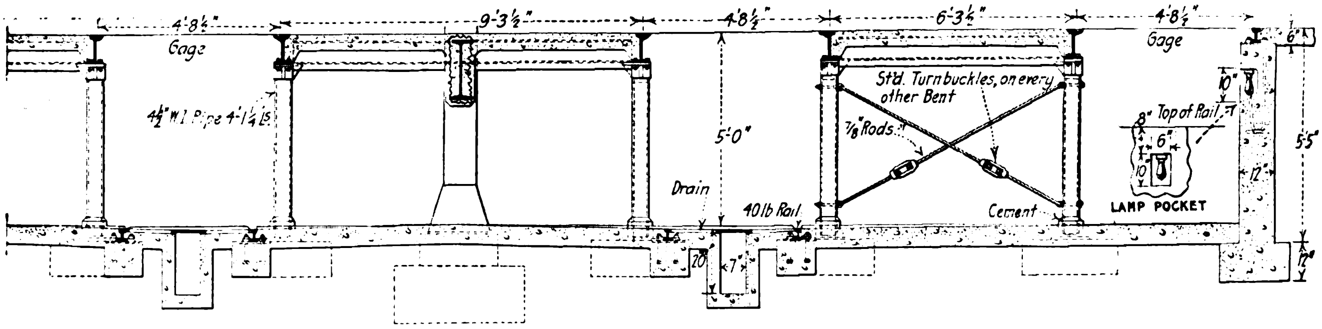
ROCHESTER CAR-YARD IMPROVEMENTS—PARTIAL SIDE ELEVATION OF SHOP


30" Galv. Iron Ventilator
17'-0" C. to C.
15'-6"
17'-4"
26'-0"
16'-11½"
5'

ROCHESTER CAR-YARD IMPROVEMENTS—CROSS-SECTION OF SHOP BUILDING, SHOWING GENERAL STRUCTURAL FEATURES


Track No 3
10" I-Beam 25 lb
2" Oak Plank
Track No 2
Checkered Plate Covers
10" I-Beam 25 lb
Clearance Circle for Jib Crane
60'-10"
Track No 1
17'-6"
Boiler Room
Sand Room
Coal Room, Lunch Room Above
Locker Room
Toilet Room
Stock Room & Office
Machine Shop
43'-0"
29'-6"
34'-0"
17'-0"
17'-0"
17'-0"
34'-0"
42'-0"
190'-6"

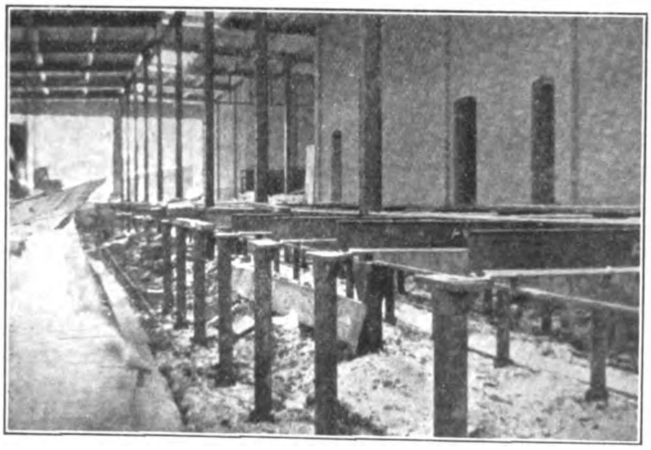
ROCHESTER CAR-YARD IMPROVEMENTS—FLOOR PLAN OF PORTLAND AVENUE SHOP


4'8½" Gage
9'3½"
4'8½"
6'3½"
4'8½" Gage
4½" W.I. Pipe 4'-1¼" Lg.
5'0"
Drain
40 lb Rail
Std. Turnbuckles, on every other Bent
7/8" Rods
Cement
Top of Rail
LAMP POCKET
6"
10"
5'5"
12"
20
7"

ROCHESTER CAR-YARD IMPROVEMENTS—CROSS-SECTION THROUGH PITS

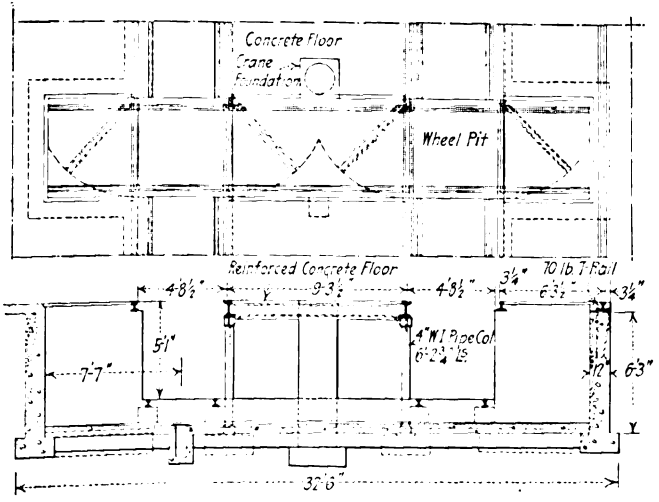
taining walls are of 1:2:5 gravel concrete, which was poured in forms in 12-in. layers and thoroughly puddled. The exterior walls are of selected hard-burned common red brick except on the street side where tapestry brick facing was used. The interior walls are of sand-lime brick. All brick was laid in sand, lime and cement mortar with ⅜-in. struck joints for common and sand-lime brick, and ⅜-in. raked joints for tapestry brick.

The roof framing is of steel I-beams and channel purlins, the beams being supported on channel and plate columns in the center and pilasters in the wall. Over the steel are 1¾-in. Georgia pine matched roofers, spiked to nailing strips bolted to the channel purlins. Over the wood is a five-ply felt and slag covering, the felt being mopped together with coal-tar pitch and the slag imbedded in this while hot.



ROCHESTER CAR-YARD IMPROVEMENTS—CONSTRUCTION VIEW, SHOWING PIT COLUMNS AND FLOOR BEAMS

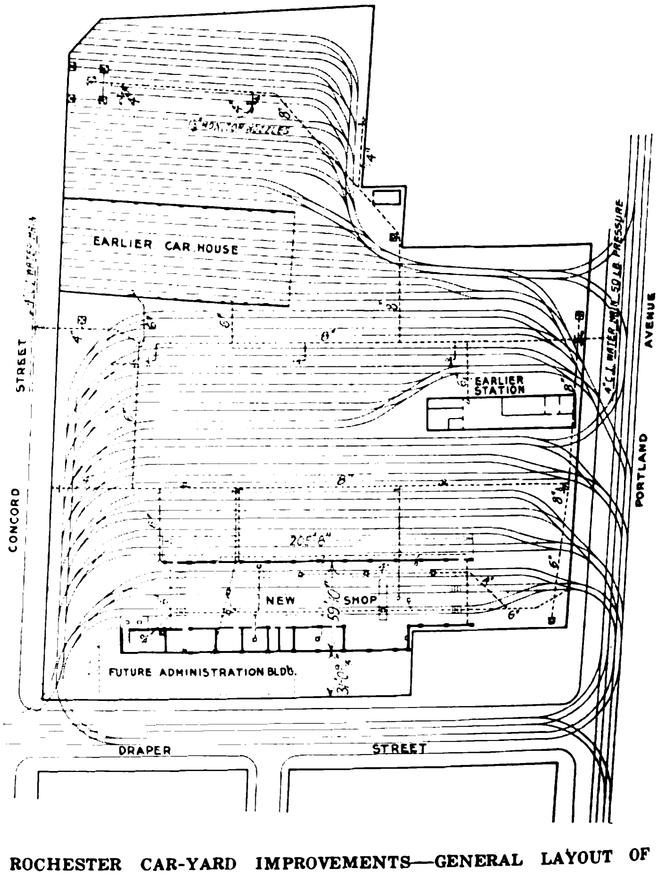
In the reinforced-concrete floors ½-in. reinforcing bars, spaced 5½ in. center to center, were placed in 1:2:4 crushed stone concrete. The surface of all floors was hardened with Trus-Con floor hardener, placed on the surface coat of 1:2 sharp sand and cement. Toncan metal was used in roof saddles, cornice and gutters. Steel rolling doors are located at the east and west ends of the shop. They are of the Kinnear type with chain operators. The shop is liberally provided with sprinkler heads, of which there are 126 on the aisle lines and 234 on the roof lines. The equipment is of the Grinnell type and it was installed by the General Fire Extinguisher Company. Two 6-in. straight-away dry pipe valves control the roof and aisle sprinklers.


Concrete Floor
Crane Foundation
Wheel Pit
Reinforced Concrete Floor
4'8½"
9'3½"
4'8½"
3¼"
70 lb. T-Rail
6'3½"
3¼"
4" W.I. Pipe Col. 6'2¼" Lg.
5'1"
7'7"
12"
6'3"
32'6"

ROCHESTER CAR-YARD IMPROVEMENTS—PLAN AND VERTICAL SECTION OF WHEEL PIT

For heating purposes the vacuum system is used in this carhouse. The steam is supplied from a nine-section No. 34 Mills boiler at 2 lb. per square inch steam pressure, while an automatic electrically-driven pump is used to maintain a vacuum of about 10 in. An equipment of this kind permits adjustment of the temperature of the steam so that fuel can be economized in moderate weather.

The arrangement of small rooms along the side of the building presents few novel features, but the pro-


EARLIER CAR HOUSE
EARLIER STATION
NEW SHOP
FUTURE ADMINISTRATION BLDG.
205'6"
8"
6"
4' C.I. WATER MAIN 50 LB PRESSURE
CONCORD STREET
DRAPER STREET
PORTLAND AVENUE

ROCHESTER CAR-YARD IMPROVEMENTS—GENERAL LAYOUT OF PORTLAND AVENUE YARD vision of a lunchroom for the men is one which we think will be greatly appreciated.

Facilities for Making Repairs

Over the pits the reinforced-concrete floor is supported on 6-in. pipe standards set in iron sockets. These pipe columns are cross-braced to give the floor the necessary rigidity. The pits are lighted by means of lamps located in pockets in the side walls.

Opposite the machine shop is a wheel pit equipped with swing rails for the removal of wheels. By means of a transfer table and a wheel jack carriage very rapid wheel changes can be made. A gib crane is mounted close to the wheel pit for use in handling parts to and from the machine shop, and chain hoists are also installed for use in lifting cars off the trucks.

The tool outfit in the machine shop comprises only those tools which are necessary for light repairs. It comprises a lathe, a drill press, a forge, a grinder and sundry smaller tools.

The cost of the new shop was $35,840, excluding track work and electrical work installed by the company. In addition the sprinkler system cost $6,630 for the monitor nozzles and underground pipe work, and $3,420 for the shop sprinklers. About five and one-half months were required for the whole job. The plans for this building were prepared by G. M. Cameron, engineer in charge of buildings and new equipment, and the track changes were carried out in accordance with plans made by D. P. Falconer, engineer maintenance of way. The contract for the shop construction was let to a local contractor.

Selling "Public Service" to a Whole State

The Methods and Means by Which New Jerseyites Have Been Led to Become Acquainted with the Manifold Activities of the Great Utility in That State

"JOINING Jersey's busy cities and thriving towns to nature's heart 'mid vales and wooded hills," run the tracks of the Public Service Corporation of New Jersey. For such a system—big in size and in the number and the variety of affiliated utility services—the problem of establishing better public relations is practically of Statewide importance. Yet such work in this case is mainly characterized by its simplicity, for the company just tells the public what it is doing. How this policy has been developed and carried out is a story that should interest the industry.

HANDY GUIDE TO GOOD ROADS IN NEW JERSEY

DIRECT CONNECTION WITH GREATER NEW YORK BY 130TH ST. FERRY TO EDGEWATER

P. S. C. PUBLICITY — ROAD GUIDE ISSUED TO 15,000 NEW YORK CITY MOTORISTS

Why the Work Was First Started

During the first few years after the Public Service Corporation was formed in 1903, the officials were busy with the rebuilding and the rehabilitation of the various consolidated properties. Then they had no time to talk, but by 1909 the feeling had grown up that the public ought to know what had been accomplished. It was not a question of answering public criticism or correcting public misinformation, but merely of providing a means whereby the public might become fully acquainted with every phase of the corporation's work.

With such an end in mind, the company in 1909 took J. L. O'Toole from the city editor's desk of the Newark *Evening News* and made him the mouthpiece for all company activities. At first his title was "publicity agent" (recently it was changed to "assistant to the president"). At the beginning President Thomas N. McCarter issued a general notice to the heads of departments that all talking to the public was to be done by Mr. O'Toole. This did not apply to the president and the vice-presidents, but even in their cases an effort was to be made to have their statements go through the publicity department, in order that all information might seem to emanate from one source. In order that Mr. O'Toole might have first-hand information on important matters, he was made a member of the executive committee of the three operating subsidiaries—railway, gas and electric.

Preparing Real Newspaper Copy

Mr. O'Toole knew from his editorial experience that writing quires of paper for the newspapers would not secure publicity worth anything. The mortality rate on newspaper copy is very high, especially on material written only to serve the purposes of the author. So Mr. O'Toole from the very first laid down the policy of turning in only such stories as he himself as city editor would have sent for if he had known they were available.

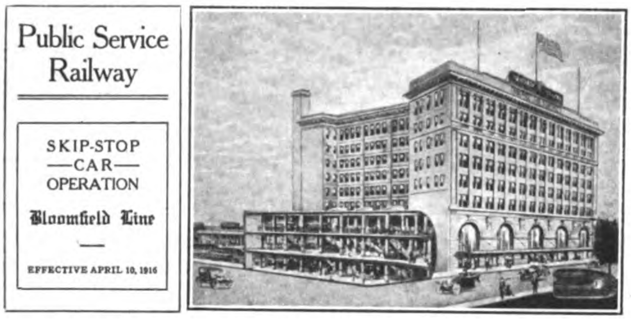
For example, the publicity department has sent out stories concerning the awarding of contracts for construction material and machinery; the formulation of welfare plans for employees; the monthly and the annual earnings of the company; definite action taken at directors' monthly meetings; extensions; service additions; rerouting and changes in headway, etc. Each story is based on an accomplishment, not a promise; on a fact, not a rumor or prediction. The telling is matter-of-fact, and no exaggeration is used to play up ordinary affairs.

Handling the Newspapers

From the beginning, Mr. O'Toole has tried to make the 115 newspapers in the company's territory feel that he is practically a staff member subject to call. His office in Newark is covered daily by the local papers, and he gets in touch with the outside papers by mail or wire.

In sending out stories, the character and the location of the newspapers are considered. Weekly papers receive shorter versions than those sent to dailies, and the same general story for papers in different parts of the State is handled in each case so as to emphasize local conditions. In all cases overwriting is shunned, for it is felt that this is a sure way of wearing out the company's welcome.

In addition to the information that is volunteered to the newspapers, the publicity department of course furnishes much material upon request. The company endeavors to make quick replies to newspaper queries. To this end the publicity department receives a daily "flash" of car delays, detailed reports of serious accidents (head-on collisions, etc.), notices of schedule changes and copies of all operating bulletins issued by the general superintendent or general manager. The department is in possession of much general information on account of Mr. O'Toole's membership on the executive committee, and any specific information along technical and other lines can, if subject to release, readily be secured from the department concerned.



Public Service Railway

SKIP-STOP
—CAR—
OPERATION

Bloomfield Line

EFFECTIVE APRIL 10, 1916

P. S. C. PUBLICITY—SPECIMEN OF CAR PAMPHLET ISSUED OCCASIONALLY; SOUVENIR POST CARD SHOWING NEW NEWARK TERMINAL

A special class of article now and then furnished to the papers—and one of considerable importance—is the long news story for the magazine section of the Sunday issues. The publicity department is glad to supply the necessary information, including photographs, maps or drawings. Along this line articles have been supplied, with illustrations, on such topics as "Building Cars in Newark Shops," "Accident Poster Series," "Training Schools for Car Crews" and "The P. S. C. Private Telephone System—Largest in the World in Miles of Wire."

When a newspaper is flagrantly wrong or unjust in its statements, the publicity department sends to it a courteous letter setting forth the facts. The purpose is not to start a controversy but to put the editor in possession of correct information so as to prevent if possible a repetition of the offense. It is rare that such a letter does not receive acknowledgment in the form of a letter or else in the guise of subsequent items worded correctly.

HOW NEWSPAPER ADS ARE USED

The company from the beginning has realized that newspaper editors have a right to exercise their judgment as to what should be printed as news, and that they are justified in editing all news copy so as to make it conform to their style. When the company, therefore, wishes to say something in exactly its own way, it does not try to restrict the freedom of the editors but buys advertising space. In this way criticism is prevented except on the part of those carping fanatics who deny to corporations the right of presenting their case in any manner.

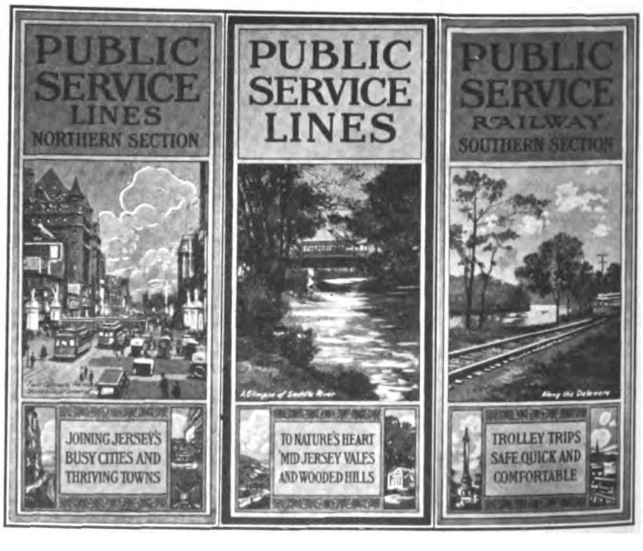
During the first six months after the publicity work was begun in 1909, the company carried on a campaign to show what had been accomplished in the preceding years of regeneration. Since then, with the exception of regular commercial advertisements to aid the marketing of gas and electric appliances and of several short campaigns against municipal ownership, the company has done no organized advertising, but has raised its official voice only from time to time as necessity demanded.

For example, last November, in answer to the malicious charges of campaign speakers about a corrupt company lobby at Trenton, President McCarter wrote a straightforward advertisement stating that the corporation, like any ordinary citizen, had the right to send its representatives to the Capitol in the light of day to express support of or opposition to proposed legislation. Moreover, in January the company told the public how service had been greatly increased in 1916 without any increase in price, but asked them to ponder what must happen if operating costs and taxes continued to mount. Such official messages are infrequent; but when they do appear they are explicit, straightforward and forcible—therefore they are doubly effective.

USING OTHER PUBLICITY MEDIA

Besides working through the newspapers, the company uses other publicity means to reach men of certain classes and patrons on particular lines, or to present a story in greater detail than would the newspapers. It has, for instance, developed a line of communication with the business and the professional men of the various communities through the readiness of the publicity representative to make speeches before chambers of commerce, boards of trade, improvement associations, men's club in churches, etc. Periodic meetings of these bodies, or special meetings called to discuss extensions or other transportation questions, afford Mr. O'Toole an opportunity to present interesting facts about the company. On special occasions President McCarter accepts invitations to address public gatherings.

Publicity is also secured through the use of car pamphlets, cards and posters. The pamphlets are used only occasionally to explain, more fully than would a news story, an operating change or proposal, such as the suggested adoption of the skip stop on a particular line in April, 1916, and a general rerouting put into effect about that time. In such cases the pamphlets, it is thought, cause a wider public understanding of the points involved. One of the pamphlets mentioned (2⅞ x 4¾ in.) is shown in the accompanying illustration.

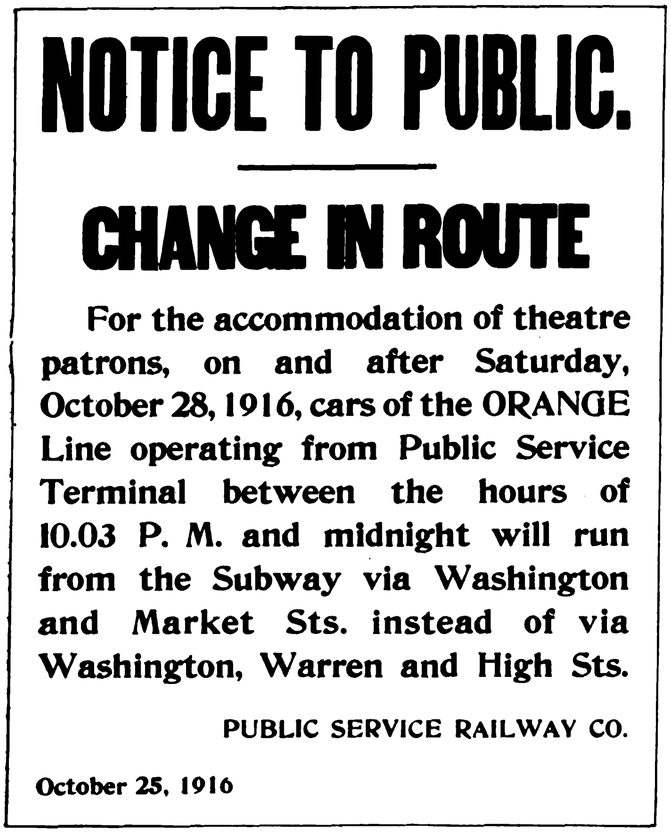

PUBLIC SERVICE LINES NORTHERN SECTION
JOINING JERSEY'S BUSY CITIES AND THRIVING TOWNS
PUBLIC SERVICE LINES
A Glimpse of Saddle River
TO NATURE'S HEART 'MID JERSEY VALES AND WOODED HILLS
PUBLIC SERVICE RAILWAY SOUTHERN SECTION
Along the Delaware
TROLLEY TRIPS SAFE QUICK AND COMFORTABLE

P. S. C. PUBLICITY—FOLDERS DESCRIBING THE COMPANY'S TERRITORY AND SERVICE

The advertising space in the cars is not controlled by the company, but it is now buying back some of the space mostly for advertising gas and electric appliances, this work being handled through the publicity department.

Though such space is available for other advertising of importance, car cards have been used as a rule only for safety work and then in a special rack suspended from the center of the car roof near the front. In this way the company used a series of twelve lithographed cards showing different types of accidents, and it is now running a series of twelve black and white admonitory messages. The safety work of the company is all handled by a special department, but the publicity bureau co-operates and writes or edits the safety advertisements.

Car cards were used in the advertising space to call attention to the opening of the fast Trenton line, but in general announcements of reroutings, excursions and other operating matters are made by posters pasted on the car windows. Judgment has been used in issuing such posters. As a result, when the car rider catches a glimpse of one, he knows that the company has an important message for him, undoubtedly with some such beneficial end in view as that evidenced by the accompanying specimen poster.



NOTICE TO PUBLIC.

CHANGE IN ROUTE

For the accommodation of theatre patrons, on and after Saturday, October 28, 1916, cars of the ORANGE Line operating from Public Service Terminal between the hours of 10.03 P. M. and midnight will run from the Subway via Washington and Market Sts. instead of via Washington, Warren and High Sts.

PUBLIC SERVICE RAILWAY CO.

October 25, 1916

P. S. C. PUBLICITY—SAMPLE CAR POSTER CONTAINING NOTICE OF REROUTING

The illustrations on pages 1085-6 show additional miscellaneous aids in publicity. Besides the usual pamphlet time-tables for its high-speed lines and lines having not less than a fifteen-minute headway, the company places in stations and commercial offices finely printed and illustrated booklets describing its system and the historic and otherwise interesting points reached. These booklets include a general one for the whole system, and separate ones for the northern and southern sections. It is stated in the newspapers that these can be secured upon request.

When the company not long ago opened its magnificent new terminal in Newark, it secured extra publicity without cost by giving a post card company the right to use the picture, as shown on the preceding page.

To help the motorist who dreads running through the congested streets of downtown New York to reach New Jersey by the lower ferries, the company prepared a handy guide showing the connection of its 130th Street ferry with good roads west of the Hudson. This guide, the front cover of which appears on page 1085, was mailed to a selected list of 15,000 motorists in upper New York City. It was greeted as a commendable sign of corporate consideration for the public.

COMPLAINTS AND CLIPPINGS

All complaints sent to the company are acknowledged at once by the publicity department. The operating official concerned is then asked for a report, and upon the receipt of this the complainant is advised of the disposition of the case. No form letters are used. A card index of correspondents is kept in the publicity office, and the letters are filed in groups of ten, the groups being numbered consecutively.

Besides a stenographer and also an assistant, who handles the publication of two company magazines devoted entirely to employee matters, there is in the publicity department a newspaper clipper. The company subscribes to all the papers in its territory, and all items relating to its activities are clipped and routed through the proper channels to the officials interested. In this way the company secures much information about local conditions and many tips about public sentiment in general.

POLICY HAS BEEN REWARDED

In carrying out its policy of letting the people know, the company has never issued a statement that would depreciate in any way later. As a result, after the first skepticism wore off, the newspapers have shown a tendency to accept the company's news as true. The papers get what they want, if such is at all possible, and they appreciate the company's co-operation.

Through the news stories in the press, and through such other means as the company, out of respect for newspaper practices and the dictates of efficiency, utilizes by itself, the inhabitants of New Jersey have been brought to a greater realization of what "Public Service" is doing for the State. Giving service and talking about it—that is the Jersey company's code—and it pleases the public.

High Cost of Railroad Material

Railroad officials are viewing with alarm the ever-increasing cost of material and equipment. To keep pace with the tremendous demand of the nation in this crisis the railroads must increase their facilities immediately, and they are doing it. Just what it is costing the railroads to live is shown by figures given out by R. J. Clancy of the Southern Pacific Company, who finds that in two years costs in some cases have advanced as much as 488 per cent. A few of the increases in cost follow: Locomotives, 75 per cent; passenger cars, 50 per cent; freight cars, 60 to 80 per cent; spikes, 130 per cent; boiler steel, 301 per cent; white lead, 353 per cent; manganese, 488 per cent; nails, 103 per cent; rivets, 200 per cent; boiler flues, 169 per cent; couplers, 112 per cent; cast-iron pipe, 173 per cent; axles, 227 per cent; steel tires, 133 per cent; bolts, 120 per cent; firebox steel, 231 per cent; journal bearings, 121 per cent; and bar brass, 165 per cent.

According to a statement which was recently issued by the National Coal Board, Council of National Defense, daylight saving reduced coal consumption in England by 300,000 tons in a single year.

Determining the "Slack" in a Schedule

The Author Offers a Novel "Service-Characteristic" Diagram as a Means of Showing at a Glance the Character of the Performance of Any Given Class of Car Equipment Regardless of Variations in Operating Conditions

By C. H. KOEHLER
Sangamo Electric Company

ALTHOUGH the motor equipment for rolling stock is generally designed for some one particular class of service, the cars are operated, in practice, almost always under widely varying conditions. On any city system, for example, a totally different character of service may be required for each of the different lines, but the same type of car may be used on all of them. Even on any one line the density of traffic may decrease or increase materially from month to month, or from hour to hour throughout the day.

During the rush hours 50 per cent more stops per mile may be made than during the off-peak hours, although no corresponding change can be made in the motors on the cars nor in the gear ratio. Consequently, if the equipment is to be adapted even approximately to the varying conditions, it is necessary to vary schedule speed. If a schedule is arbitrarily fixed, and calls for a higher speed than the motors can provide, operation will become disorganized. If the schedule is set low enough to take care of the most severe conditions, a serious, although avoidable loss will occur when operating conditions are relatively easy. In general, the setting of schedules by individual test runs is made difficult by the numerous changeable factors involved, which require the taking of averages of many results for accurate work. However, a simple means exists for definitely determining the amount of "slack" in any schedule regardless of the traffic density, and it is with the idea of calling attention to this fact that this article is written.

THE "SERVICE-CHARACTERISTIC" DIAGRAM

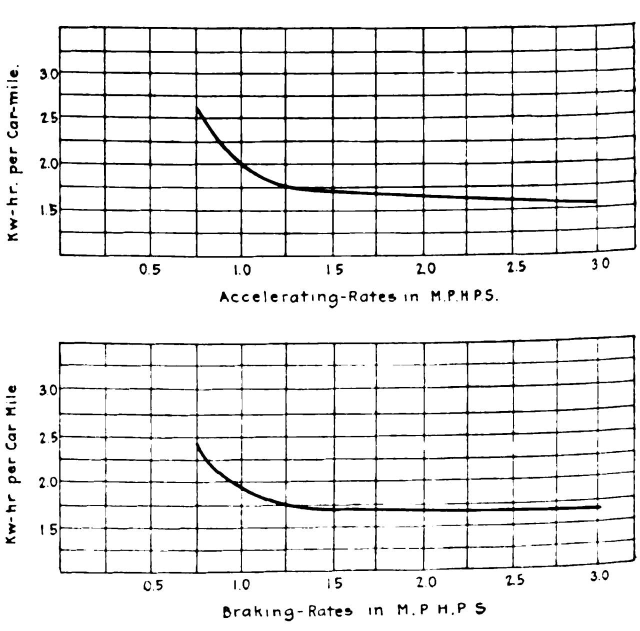
With a given equipment, a given line voltage and given gradients and curvatures, together with reasonably efficient operation, the maximum possible schedule speed on any line is established directly by the length of and number of stops per mile. When the two latter factors have fixed values the maximum schedule speed of the given equipment is definitely limited, and nothing can be done to increase the speed beyond this point. No more power can be absorbed by the motors, and in consequence, the energy input is also fixed. Grossly inefficient acceleration or braking will, of course, increase the energy consumption, but since it is safe to assume that 1.25 m.p.h.p.s. is the minimum rate that could be used by reasonably well-trained motormen with modern equipment, and since the decrease in energy consumption effected by higher rates than this is negligible, as shown in Fig. 1, it may be said safely that both the energy consumption and the maximum schedule speed are established by the length and number of stops per mile.

There is, therefore, a relation between energy input and maximum possible schedule speed for any given equipment, the two quantities varying inversely as the dominating factor of stops per mile changes in value. Only by decreasing the number of or length of the stops can the maximum possible schedule speed be increased, and when this is done the less frequent accelerations produce a corresponding decrease in energy consumption.

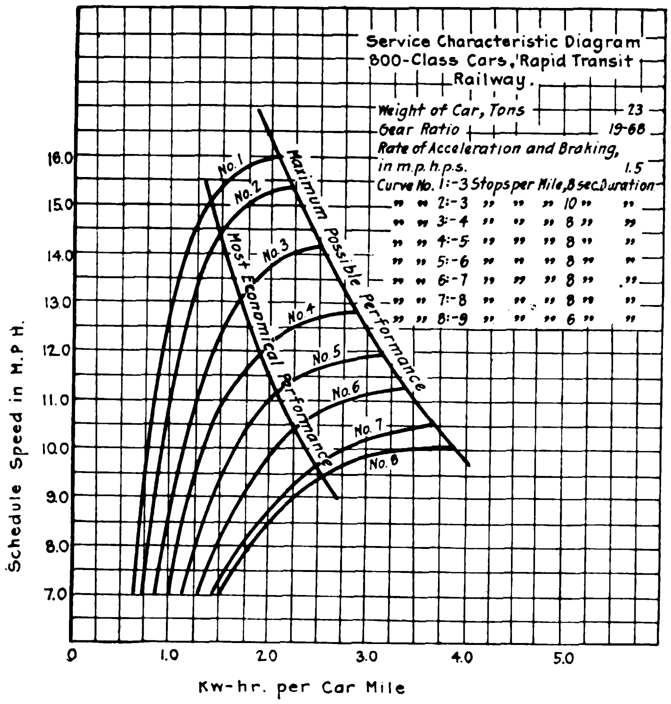
The foregoing paragraphs have considered only the maximum schedule speeds that may be obtained with the given equipment. However, the best service is not rendered with an average schedule speed that too closely approaches the maximum speed possible under the given operating conditions. Rather, the best service is represented by an average schedule speed that is slightly less than the possible maximum, thus providing a reserve or "slack." With this reserve there is afforded sufficient time for making up usual every-day delays so that the cars can hold steadily to schedule time except under extraordinary circumstances. A certain amount of "slack" is desirable and is commonly provided in every schedule, although of course the amount should be minimized.

For any given schedule speed, the use of this slack directly affects the energy input at the car. Thus, energy consumption increases as the slack is used in making up lost time or rendering heavier service. Similarly, the energy consumption decreases as easier operating conditions enable the operator to use slack time in coasting.

From the foregoing consideration it appears that data on energy input and schedule speed might be plotted in some manner to indicate readily the actual slack and its use, when operating with a given equipment in various services. Such a graph, or "service-characteristic" diagram, as it might well be called, is shown in Fig. 2. The numbered curves making up this diagram are easily derived from data on the calculated energy consumption



SLACK IN SCHEDULES—FIG. 1—DIAGRAM SHOWING NEGLIGIBLE EFFECT ON ENERGY CONSUMPTION OF CHANGES IN ACCELERATING AND BRAKING RATES ABOVE 1.25 M.P.H.P.S.



SLACK IN SCHEDULES—FIG. 2—SERVICE-CHARACTERISTIC DIAGRAM SHOWING PERFORMANCE CURVES AND EIGHT EQUIVALENT-SERVICE CURVES FROM WHICH THEY ARE DERIVED

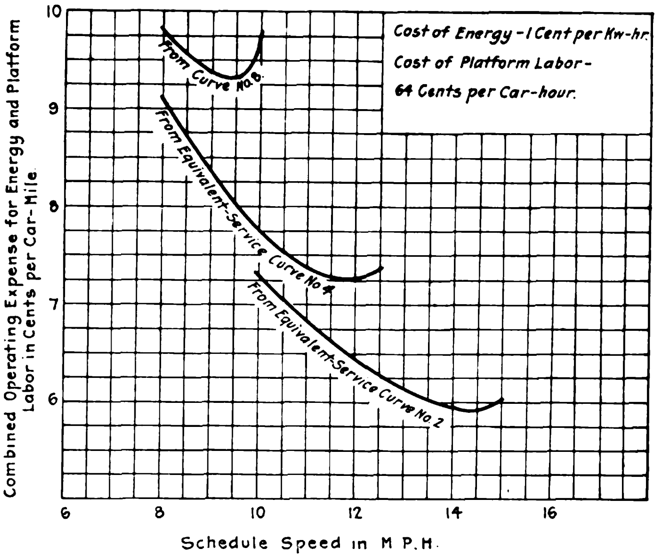
and schedule speeds of a given car making stops of various lengths and frequencies per mile. These curves lose their identity in combination and may be referred to merely as equivalent-service curves. The area included by the outermost curves represents values for all combinations of number and length of stops with the given equipment, or for every possible kind of service demand on the equipment.

All of the equivalent-service curves have the same characteristics and do not cross each other. The same curve will represent different combinations of number and length of stops per mile, but as any such series of combinations represents the same "equivalent-service" demand on the equipment, it becomes possible to neglect altogether consideration of the relative weight of the factors, number and length of stops, if the area covered by the diagram is considered rather than individual curves.

The point of tangency with the horizontal for each "equivalent-service" curve represents the maximum possible schedule speed that can be made, when rendering that particular equivalent service, together with the corresponding energy input. Connecting the points of tangency with the horizontal for the various "equivalent-service" curves produces the curve marked "Maximum Possible Performance."

This curve really defines the limit of operation with the given equipment under various conditions. Points beyond this line, or outside of the diagram, represent impossible schedule speeds for the co-ordinate energy input, with the equipment for which the diagram was developed.

By determining the various values of the two major items in the direct cost of operation (platform expense per mile plus cost of energy per car-mile) at several schedule speeds for one of the "equivalent-service" curves, a series of approximations of the direct cost of transportation may be obtained and the minimum cost ascertained. By plotting such results graphically, as shown in Fig. 3, the most economical schedule speed for this particular service can be readily determined. Repeating this procedure for several of the "equivalent-service" curves gives sufficient points with which to locate the curve "Most Economical Performance," as shown in Fig. 2. This curves locates approximately the most economical schedule speed for every possible kind of service that can be rendered with the given equipment. It also defines the limits for the amount of slack on the schedule that is necessary for good service.



SLACK IN SCHEDULES—FIG. 3— GRAPHICAL METHOD OF DETERMINING MINIMUM VALUE FOR SUM OF ENERGY COST AND PLATFORM COST FOR THREE OF THE EQUIVALENT SERVICES SHOWN IN FIG. 2

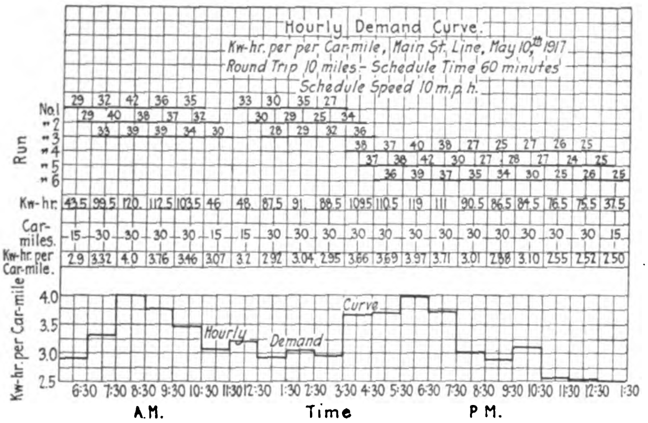
The curve "Maximum Possible Performance" defines the line of zero slack, or schedules that have not any reserve time with which to make up ordinary delays. To the left of this curve the slack gradually increases, till at the curve "Most Economical Performance" it approximates a condition of maximum efficiency. Beyond the curve of most economical performance the slack increases in a proportion that is greater than necessary for good service, and this waste of time means largely increased total operating expense, even though small amounts of power may be saved.

USE OF "SERVICE-CHARACTERISTIC" DIAGRAM

Summing up, it would appear that this diagram might be valuable for analyzing traffic conditions, were it possible to determine the particular service conditions. To this end one co-ordinate—schedule speed—is always obtainable. The number and length of stops varies through wide limits even on a single run, and this factor is difficult to obtain. However, the kilowatt-hours per car-mile may be very easily determined by meter readings. This value of energy input, together with the known value for schedule speed, definitely locates a point on some one of the "equivalent-service" curves. In other words, for a given schedule and any particular set of operating conditions a given equipment consumes a fixed amount of energy if there is no slack. If slack is present the energy consumption will be proportionately less and the difference between the maximum and actual figures for energy consumption serves as a measure of the slack.

By means of meters installed on the cars and read every trip, the exact number of kilowatt-hours per car-mile for any hour of the day may be obtained, and when this figure is used in conjunction with the schedule speed, the exact "equivalent-service" demand may be read directly from the diagram. Thus the slack is definitely determined without calculating or even estimating the number of or length of stops per mile!

To put the data obtained from wattmeters, which are in the form of trip readings in kilowatt-hours, into shape for the proper analysis, it is advisable to determine in hourly increments the average service demand of all cars on the line under investigation. Such an hourly demand for a selected case is shown in Fig. 4. In this the different runs are plotted in horizontal graphs, and the kilowatt-hours per trip are recorded on each section that represents one trip on the graphs. The hourly demand in kilowatt-hours is obtained by estimating the value in kilowatt-hours of the graphs in each hourly section. The mileage is calculated likewise, and from these two figures the average of kilowatt-hours per car-mile is plotted.



SLACK IN SCHEDULES—FIG. 4—HOURLY DEMAND GRAPH FOR PARTICULAR CASE AND DATA FOR ITS DETERMINATION

From Fig. 4 it may be seen that, between the hours of 7.30 a. m. and 8.30 a. m. the energy consumption is 4 kw.-hr. per car-mile. This energy consumption, together with the known schedule speed of 10 m.p.h, which applies in the case of the records shown on Fig. 4, establishes a point on the "service-characteristic" diagram of Fig. 2. It will be found, however, that this point falls above or to the right of the curve "Maximum Possible Performance," and at first glance it might appear that the readings of kilowatt-hours per car-mile must have been in error. However, this is in the rush-hour period. The men all ran behind time! They could not make the required schedule speed of 10 m.p.h. but they operated as best they could, or with zero slack. The line of zero slack crosses the 4 kw.-hr. per car-mile value at a schedule speed of 9.8 m.p.h., and because of heavy traffic conditions, including slow-downs as well as stops for passengers, the men could only average 9.8 m.p.h. throughout this period, making up this lost time in the succeeding hour.

If it is desired to approximate the most economical schedule speed for this particular "equivalent-service" demand, trace a curve of the same trend as curve No. 8 from the point on the diagram that indicates 4 kw.-hr. and 9.8 m.p.h. It will be found to cross the line of most economical performance at a point corresponding to 9.3 m.p.h. This latter speed will provide approximately the most economical operation, as well as plenty of reserve slack with which to prevent the kind of service that is being rendered when a 10 m.p.h. schedule speed is called for and not maintained. It is also to be noted that the 7 per cent decrease in schedule between 10 m.p.h. and 9.3 m.p.h. speed effects a 35 per cent decrease in energy consumption during the hour in question. Coming as it does in the peak-load period, such a saving would go far to offset the increase in other operating expenses that might be expected from the slightly slower movement of the cars.

Similarly, the actual efficiency of transportation, and the actual amount of slack, can be determined for this given line for any hour of the day and the effect of proposed changes in schedules approximately determined. The simplicity of the scheme lies in the fact that the superintendent of transportation can supply himself with a set of service-characteristic diagrams made up from calculated speed-time curves by the engineering department, and by using data on schedule speeds and kilowatt-hours per car-mile, can analyze his traffic conditions and correct his schedule without himself ever even giving a thought to the intricacies of the speed-time curve or making complicated traffic tests.

Handling Complaints from Patrons*

No Complaint Should Be Neglected—Proper Handling Means Better Public Relations—How the Detroit United Complaint Department Works

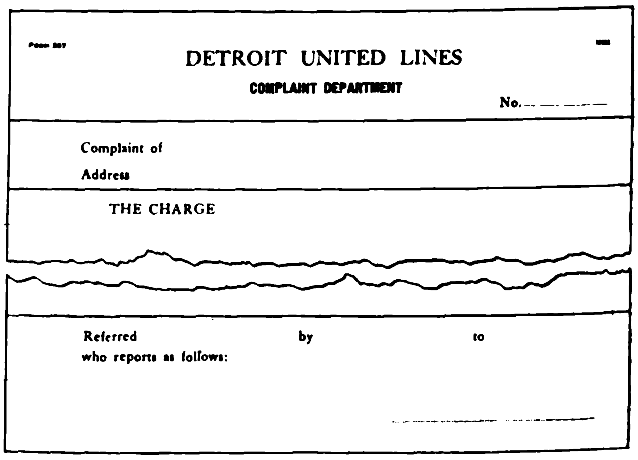
BY A. D. B. VAN ZANDT
Publicity Agent Detroit (Mich.) United Railway

IN friendships and dollars it does not pay any public utility to play ostrich and hide its head against complaints. In my opinion, no complaint is so trivial that a company can afford to treat it with neglect. It is true that each complaint takes up time which, on occasions, we believe might better be devoted to other things. This appears a waste of valuable minutes, but is it?

In considering any complaint we must keep in mind constantly that the complainant is matching his time against ours. He most likely and with reason thinks that his minutes are as valuable to him as our time is to us. In truth, we should be gratified that our patrons think enough of us to spend their time in order that we may know of the things they think have gone wrong.

Have you ever considered that absence of complaints is any evidence that you are free from fault? If that is your self-satisfied viewpoint, it would be well to get it out of your system. Abolish it just as fast as you can, and you may find some things in your organization in need of bracing.

If you are not receiving complaints, the odds are that your patrons have come to the conclusion that you pay no attention to them and that there is no use of them wasting their time. I venture the suggestion, too, that if you are not receiving complaints, you are not receiving any great number of commendations.


DETROIT UNITED LINES
COMPLAINT DEPARTMENT
No.

Complaint of
Address

THE CHARGE

Referred by to
who reports as follows:

HANDLING COMPLAINTS—FORM 1—TRIPLICATE FORM USED FOR TYPING COMPLAINTS

How Complaints Can Help to Better Public Relations

No complaint is so small or so large that it cannot be turned to excellent account in strengthening public relations. In this respect a complaint, properly handled, is second only to good service. Complaints, too, often let you know of the misconceptions in the public mind which you can in many cases correct. Not infrequently, too, complaints give you a better line upon your force than you frequently obtain through your system of inspection.

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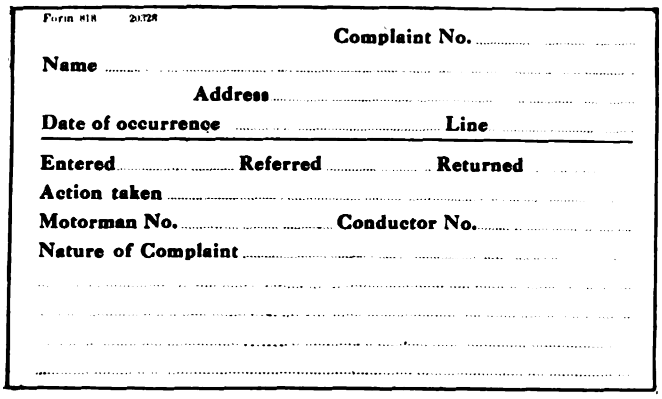
*Abstract of paper read before Canadian Electric Railway Association on June 5, 1917.

Is it not a good thing for your organization when you learn through an accumulation of complaints that Jones is a surly, snarling, offensive conductor; that Smith operates his motor and brakes in a manner that does neither the car nor the passengers any good? Surely. Through a willingness to listen respectfully to complaints you get this and other important information worthy of investigation. You will find any number of patrons willing and glad to be of assistance when they find the management is striving hard toward the goal of perfection. This is one form of publicity you need. It is uplifting.

Is it not equally good for you when you have convinced Mr. Black that your reason for not issuing transfers at a certain point is based upon sensible ground: when you have explained to Mr. Green that a delay in the service was not your deliberate act but was caused by a truck stalling in the track, pointing out to him that any delay is costly to you? Assuredly so. You are educating these men to the point that when the next thing goes wrong they will pause before rushing into print or denouncing your company and its stockholders. This is another form of publicity you need in these days when so many newspapers endeavor to fatten themselves at your expense.



Form 818 20,728

Complaint No.

Name

Address

Date of occurrence **Line**

Entered **Referred** **Returned**

Action taken

Motorman No. **Conductor No.**

Nature of Complaint

HANDLING COMPLAINTS—FORM 2—CARD INDEX RECORD OF COMPLAINT DATA

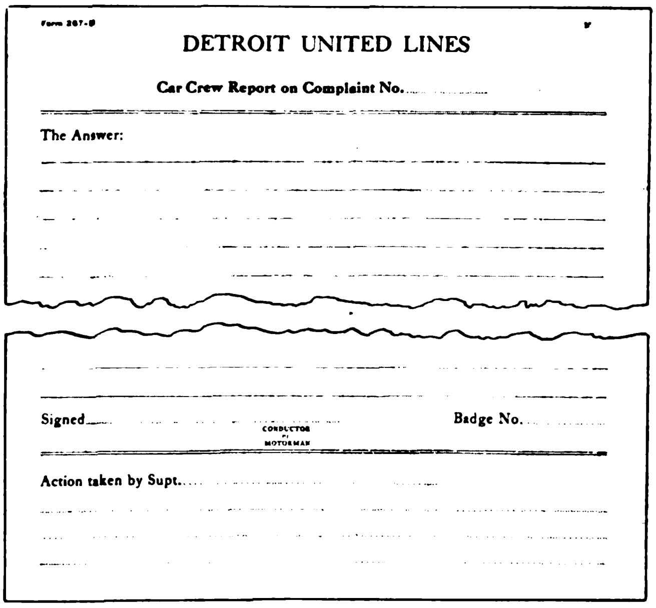
The square treatment of complaints tends greatly toward bettering your relationship with the people who pay you for transportation service. It helps them to know that your people are as human as themselves. It goes far toward counteracting the efforts of political blatherskites who seek to ride into public office by knocking, knocking, knocking.

Prompt, proper and decisive action on complaints does not mean that you should assume a humble, submissive air and admit as right claims that you know are wrong. It is a clear-cut business matter. Nor are you going to convince all the complainants that you are right. You will find many who will fail to come over to your side, for "a man convinced against his will is of the same opinion still."

THE DETROIT UNITED COMPLAINT DEPARTMENT

These, in brief, are the reasons we have for organizing a complaint department on a systematic basis and keeping an accurate record of the handling of complaints from first to last. The Detroit United Railway combines its complaint department with its publicity department. Our complaint department is entirely different from the claims department. The latter, of course, handles possible monetary considerations. It occasionally happens that on completing a complaint investigation there may appear to us the possibility of some one seeking financial damages. In such cases the entire file is forwarded to the claims department for such use as may be deemed necessary. We, however, retain our card index (which will be explained later), making thereon the proper notice of reference.

Complaints which are not immediately closed are typed in triplicate on the record shown in Form 1. This form consists of two white sheets and a blue sheet, each 8 in. x 10¾ in. The blue copy is retained temporarily in the files of the complaint department, until such time as the complaint has been investigated and reported back. In the meantime acknowledgment has been made of the complaint, if it has come through the mails.



Form 207-B

DETROIT UNITED LINES

Car Crew Report on Complaint No.

The Answer:

Signed CONDUCTOR MOTORMAN Badge No.

Action taken by Supt.

HANDLING COMPLAINTS—FORM 3—FORM FOR SECURING STATEMENT OF EMPLOYEE CONCERNED IN COMPLAINT

After the complaint has been prepared and before it is forwarded for action, the case is entered upon the card index (Form 2), the name and number corresponding for purposes of ready reference. This having been done, the two white copies of Form 1 are forwarded to the disciplinary officer. This official detaches one of these for his checking purposes, and the other he notes and forwards to the superintendent of the line on which the alleged offense occurred.

The superintendent then makes an investigation and secures in writing on Form 3 the statement of the employee concerned. This is a yellow form (8 in. x 10¾ in.) printed on both sides. Thus it may be used by both motorman and conductor if a double statement is called for in the investigation. The superintendent makes a note of his action on the employee's statement, and Form 1, with Form 3 attached, is then returned to the disciplinary officer, who forwards these with his check copy to the complaint department. Here the action taken is marked upon the index card. The blue check copy is then destroyed, the completed file taking its place. At the same time, if deemed necessary, a communication is again sent to the complainant.

This system, it should be noted, allows the superintendent to have a handy reference concerning the record

of the employees. For instance, should proof be obtained of an offense that should be entered upon the written record of the employee, notice of this is sent in brief form to the record keeper in the employment department. There a notation giving the complaint number is entered. If the record should at any time be under investigation, the complete case, showing the name of the complainant and all the testimony, is available.

Up-State New York Lines Need Relief—II

The Analysis of Their Condition Begun by the Author Last Week Is Continued by a Consideration of the Allowance Being Made for Depreciation — A Serious Condition Is Disclosed

By THOMAS CONWAY, Jr., Ph.D.
Professor of Finance, University of Pennsylvania, Philadelphia, Pa.

THERE is unmistakable evidence of the growing financial difficulties of the electric railways that operate under the jurisdiction of the Public Service Commission, Second District, of New York. This evidence is furnished by a few comparisons. It will be remembered that, in spite of an increase of some $4,000,000 in gross operating revenue during the five years from 1911 to 1915 inclusive, the net income remaining after the payment of interest and rental charges decreased from $4,294,000 to $933,000. As a natural consequence of this decline in net income, the dividend record of the up-State companies during these years has been progressively more unfavorable. Twenty-six companies paid dividends in 1911; in 1912 the number of dividend-paying companies was reduced to twenty-five; in 1913 it fell to seventeen, while in 1914 and 1915 eighteen companies paid dividends upon one or more classes of stock.

Even more significant is a comparison of the record of the companies which were not only unable to earn dividends but which actually operated at a deficit after meeting interest payments and other fixed charges. The record is graphically presented in Fig. 1, the figures being for the calendar year in each case, that being also the fiscal year of the commission.

In brief, thirty-two companies, or approximately one-half of the total number comprised within the Second District, were operating at a deficit in the year 1915. The increase in the number of companies so operating at a deficit during the last two years, as shown in Fig. 1—or in other words, since the outbreak of the European War—is especially significant. It is, of course, due to the continuous increase in the cost of living of these corporations, which has not yet reached a culmination and which is certain to be higher in the future months than it has been at any time during this period.

UNITED STATES SUPREME COURT HAS DECLARED DEPRECIATION ALLOWANCE A DUTY

Judged solely from the standpoint of the returns paid to security holders, the above record is sufficiently unsatisfactory to warrant efforts for relief. Unfortunately such a comparison does not, in any sense, reveal the dire extremities to which the electric railways are reduced. The worst feature of the current situation is the inability to make adequate provision for depreciation. The public service law of the State of New York provides that "In determining rates of common carriers, railroad and street railroad corporations, the commission shall give due regard, among other things, to a reasonable average return upon the value of the property actually used in the public service and to the necessity of making reservation out of income for surplus and contingencies." The phrase "surplus and contingencies" as here used has been construed by the commissions as including a depreciation requirement.

That such a requirement is constitutional is beyond doubt. The Supreme Court of the United States, in the so-called Knoxville case, decided in 1909, laid down a rule which not only supports the right of the state to require a corporation to make provision for depreciation, but jeopardizes the position of a corporation which does not make such provision. The court said:

"Before coming to the question of profit at all, the company is entitled to earn a sufficient sum annually to provide, not only for current repairs, but for making good the depreciation and replacing the parts of the property when they come to the end of their life. The company is not bound to see its property gradually waste, without making provision out of earnings for its replacement. It is entitled to see that from earnings the value of the property invested is kept unimpaired, so that at the end of any given term of years the original investment remains as it was at the beginning. *It is not only the right of the company to make such a provision, but it is its duty to its bond and stockholders, and, in case of a public service corporation at least, its plain duty to the public.*[*] If a different course were pursued, the only method of providing for replacement of property which has ceased to be useful would be the investment of new capital and the issue of new bonds or stocks. This course would lead to a constantly increasing variance between present value and bond and stock capitalization—a tendency which would inevitably lead to disaster, either to the stockholders or to the public, or both. If, however, a company fails to perform this plain duty and to exact sufficient returns to keep the investment unimpaired, whether this is the result of unwarranted dividends upon over-issues of securities, or of omission to exact proper prices for the output, the fault is its own. When, therefore, a public regulation of its prices comes under question, the true value of the property then employed for the purpose of earning a return cannot be enhanced by a consideration of the errors in management which have been committed in the past."

The above quotation is inserted here because it could hardly be more apposite to the situation of the New York companies if it had been written as a special admonition to these corporations. The Supreme Court of the United States has served a public warning to the utility managers that it is their "plain duty . . . to exact sufficient returns to keep the investment unimpaired" and that "the omission to exact proper prices for the output" is the fault of the company. The court further warned the utilities that it "would not condone errors in management" which resulted in a failure to make adequate provision for depreciation. In the face of this solemn admonition, any public utility which neglects this very important matter is assuming a risk which cannot be justified by prudent standards.

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[*] Italics are by the author of this article.

NEW YORK STATE HAS SAME POLICY

The New York Public Service Commission for the Second District early in its history clearly set forth its policy with reference to requiring depreciation allowances. In the matter of the application of the Niagara Light, Heat & Power Company for authorization to issue bonds, decided in June, 1909, the commission first announced its policy concerning this important mattter. It appeared that a considerable part of the proposed bond issue was sought to be issued to pay for replacements of part of the applicant's plant which already stood charged to fixed capital. After stating the facts, the commission, in its opinion, remarked, "If the process described is legitimate, it can rightfully be extended to the whole plant it owned seven years ago. When the process is complete, it would owe for two plants; it would represent to the world that it had the value of two plants with which to meet this indebtedness, and yet it would have only one plant. When the new plant in turn became old or worn out, the same process would still be legitimate, and after being carried out, the company would owe for three plants, and have but one; and so on *ad infinitum.*

"This is the exact method which corporations have in large numbers of cases been pursuing, and most unfortunately, as in this case, desire to continue. Where is it to stop? The consequences of such financing are too obvious to require statement. An end to such rottenness of method when the regulating hand of the law does not interfere, finally comes in a dilapidated and useless plant. Bondholders have nothing from which to collect their money. Stockholders have lost all they invested, if indeed they ever invested anything, and the public is given wretched and wholly inadequate service. This is no fancy picture. It correctly delineates what is happening now and has frequently happened in the past. The practice of making replacements with the proceeds of bond issues has been and is one of those most fruitful of evil."

The principle laid down in the above case was reaffirmed and amplified in the decision of the commission on the application of the Binghamton Light, Heat & Power Company for the validation of securities proposed to be issued, decided in August, 1909. The necessity for a depreciation reserve was well stated by the commission in the following manner:

"The greater proportion of the fixed capital of a public service corporation is inevitably worn out or destroyed in performing the service required of it. Ordinary repairs merely delay but can not prevent the inevitable hour when such capital will be dissipated. *This depreciation and final extinction of capital must be borne by the consumer because it is essentially a part of the cost of production of the article or service for which he must pay.** Unless the consumer pays the entire cost of production it is impossible for production to continue permanently."

The rule as here laid down has been steadfastly followed by the Second District Commission and by the courts in the State of New York. There can be no doubt that it is binding alike upon all classes of public utilties.

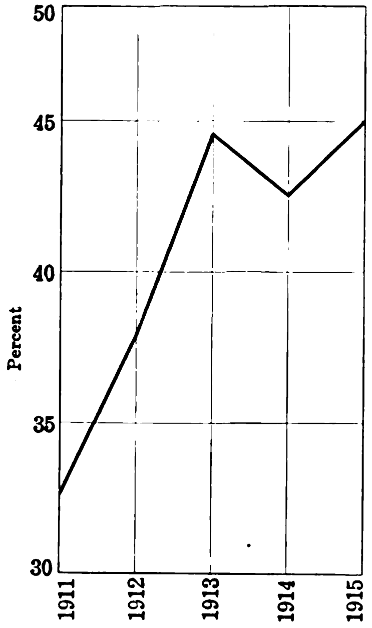

Fig. 1

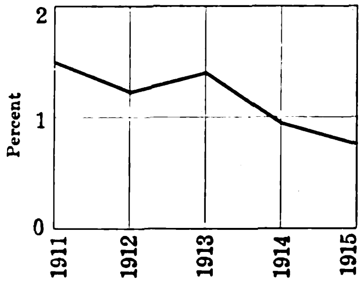

Fig. 2

Fig. 1—Showing percentage of electric railway companies in New York State, Second District, which had a deficit after payment of operating expenses and fixed charges.

Fig. 2—Showing decline, in terms of percentage, that the depreciation fund bears to the total funded debt of those companies which set aside depreciation.

Fig. 3—Showing the actual depreciation allowances of all companies (assuming funded debt to represent physical value), as compared with assumed rate of 4½ per cent.

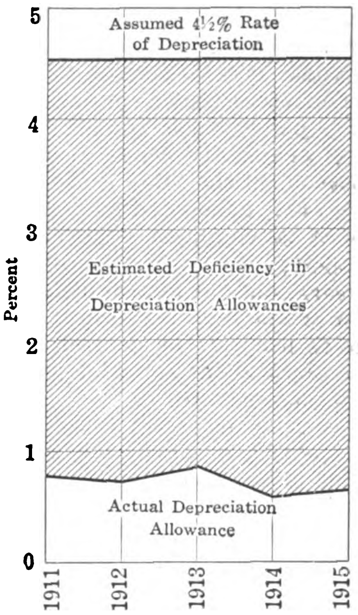

Fig. 3

DEPRECIATION ALLOWANCE NOW ONLY 0.75 PER CENT OF FUNDED DEBT

What provision has been made by the electric railways within the Second District for creating depreciation reserves? According to the reports of the commission, the proportion of companies making depreciation allowances of some character has been as follows: 1910, 38 per cent; 1911, 40 per cent; 1912, 47 per cent; 1913, 45 per cent; 1914, 48 per cent; 1915; 60 per cent. With the exception of one year, there has been a gradual and steady increase in the proportion of companies making some attempt to create a depreciation reserve. It is significant, however, that fully two-fifths of all of the companies operating within the Second District failed to make any provision for depreciation as late as 1915. It need hardly be pointed out that under the rule of the United States Supreme Court such corporations are running the danger of losing a considerable proportion of their original capital investment in a physical valuation, because of the failure to provide proper depreciation.

While the number of companies which have set aside depreciation has steadily increased, yet, because of the growing financial difficulties, the percentage so applied has shown an alarming decrease. For example, the amount of depreciation set aside by the companies making provision for depreciation, as compared with their total funded debt—assuming that the funded debt represents in an approximate way the value of their depreciable property devoted to electric railway uses—was in 1911, 1.49 per cent; in 1912, 1.26 per cent; in 1913, 1.36 per cent; 1914, 0.96 per cent; 1915, 0.75 per cent. Fig. 2 is a graphic showing of the considerable decline in the ratio between the depreciation set aside and the funded debt of those companies making such provision.

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*Italics are by the author of this article.

WHAT IS A PROPER DEPRECIATION ALLOWANCE?

In the opinion of the writer, the most serious aspect of the current situation of the properties within the Second District is the inability to make proper depreciation allowances. What is a proper depreciation allowance for an electric railway? On this matter there has never been a specific ruling by the Second District Commission. The Wisconsin Commission has held in a number of cases that a corporation should set aside at least 4½ per cent per annum of the total value of its property subject to depreciation. The Massachusetts Commission, in the "Bay State Rate Case," decided in August, 1916, announced that, according to the investigations of its engineers, "the 'composite life' of the entire property, based upon these estimates, proved to be 29.26 years, and the annual depreciation, expressed as a per cent of the total investment, was 3.4 per cent. The 'composite life' of the depreciable property alone was 22.69 years, and the annual depreciation 4.41 per cent."

These reserves are cited as typical depreciation allowances made in recent cases involving a street railway property. A rate of 4½ per cent per annum upon the value of the depreciable property may be taken for our purposes as a rough average to be used in calculating the extent of the deficiency in depreciation appropriations. It should be added parenthetically that it is doubtful whether the rate of 4½ per cent is adequate at the present time. The enormous increase in the cost of all classes of labor necessary for construction work, and of the various classes of materials involved, point unmistakably to the necessity for larger depreciation allowances at the present time. It is variously estimated that under present conditions the cost of identical articles to replace those which must be discarded will range from 30 to 100 per cent above the cost of a few months ago. It would appear very conservative, therefore, for a corporation to ask for earnings sufficient to enable it to set aside 5 per cent per annum as a minimum reserve on the value of its depreciable property.

In the absence of authoritative data concerning the value of the physical property of the electric railways in the Second District, recourse must be had to a method of calculation which will err, in all likelihood, in that it underestimates the value of the depreciable property of these corporations. It is a fact well known to all investment bankers and experienced electric railway executives that conservative banking houses will not float the bonds where the amount of bonded debt outstanding exceeds the physical value of the property of the corporation. Bankers and investors demand physical value at least dollar for dollar for bonded debt, while in a large proportion of cases, a substantial excess of physical value over bonded debt must be in existence. If we assume, for the purpose of illustrating the extent of the deficiency in depreciation allowances, that the physical value of the electric railways in the Second District subject to depreciation is at least equal to the bonded debt of these properties, it is possible to show in a general way how inadequate has been the provision which these corporations have been able to make for depreciation. Fig. 3 shows graphically the amount which should have been set aside for depreciation in each of the last five years upon the basis of 4½ per cent upon the total bonded debt of all of the electric railway companies within the district. In comparison is shown the amount which has been set aside by those companies which were able to make some appropriation. Although the diagram illustrates the alarming discrepancy which exists, yet the full extent of the probable inadequacy of depreciation reserves cannot be appreciated without a comparison of the actual figures. This is given in the accompanying table:

TABLE SHOWING AMOUNT OF DEPRECIATION REQUIREMENT (ASSUMED AS 4½ PER CENT) FOR ELECTRIC RAILWAYS IN SECOND DISTRICT, AMOUNT ACTUALLY SET ASIDE AND ESTIMATED DEFICIENCY

Year	Depreciation Requirement, Assuming it Equal to 4½% of Total Bonded Debt	Amount of Depreciation Actually Set Aside	Estimated Deficiency in Depreciation Appropriations
1911	$4,013,870	$672,695	$3,341,175
1912	4,082,539	660,731	3,421,808
1913	4,842,994	868,579	3,974,415
1914	5,904,901	753,483	5,151,418
1915	6,080,309	833,106	5,247,203

The reason that the electric railways cannot set aside adequate depreciation is obvious. Their earnings are insufficient. Indeed an argument which alone would warrant the commission to authorize a general advance in rates would be in order that proper depreciation allowances might be made. The year 1915 will serve as an illustration. In that year, the total depreciation reserve set aside aggregated $833,106, and this equalled only 0.326 per cent of the total capitalization of all of the up-State companies, and was equal to only 0.411 per cent of the capitalization of those companies which set aside any depreciation. Four and one-half per cent on the total bonded debt of the up-State companies would require an annual depreciation appropriation of $6,080,309. Against this, the companies actually set aside $833,106, or $5,247,203 less than the required amount. To make such an appropriation would require an increase of 16.8 per cent in the operating income of the companies.

If earnings were increased $5,247,203, the financial position of the companies would be tremendously improved. Instead of having, as shown by the commission's figures for the year ended June 30, 1915, only $10,267,000 applicable to interest and other charges of $9,333,000, the companies would have $15,514,000 out of which to meet fixed charges aggregating $9,333,000. Stating the matter in another way, instead of having net earnings exceeding fixed charges by only 10 per cent, the companies would enjoy an excess of net earnings over fixed charges of 66 per cent.

THE DUTY OF THE COMMISSION PLAIN

With the depreciation situation in mind, it is patent that the question of delaying an advance in rates until a valuation of electric railway properties has been made, is of such minor importance that the commission is undoubtedly warranted in granting an immediate increase in rates, irrespective of valuations. Even though the present unusual conditions did not prevail, the corporations are clearly entitled to a larger revenue. It is their duty, as the Supreme Court of the United States has pointed out, to demand sufficient revenues to make adequate depreciation allowances. The present opportunity should be seized to make this demand in no uncertain terms. The impossibility of making adequate depreciation allowances within recent years should be duly emphasized, and the duty of authorizing an increase in rates to provide for a sufficient depreciation allowance should be strongly suggested to the commission. If this is done, the position of the companies in resisting unwarranted reductions in subsequent valuations because of inadequate depreciation allowances—in case relief is not extended—would be almost impregnable. The fault would lie wholly with the commission whose duty it is to protect not only the traveling public but the investor in public utilities.

It should be further emphasized that the grave inadequacy of revenues, which has existed continuously for a considerable period of time, destroys the argument which might be advanced, that the commission should not increase rates upon the possibility that operating costs will be higher in the future. The financial situation of the up-State electric railways has been intolerable for such a prolonged period of time, that, even though the present acute and distressing situation did not exist, substantial relief would be imperative. With the prices of labor and materials mounting day by day, there can be no doubt that the commission will be justified in taking prompt action to relieve the electric railways from their financial dilemma. In taking such action, the commission can safeguard the interests of the public. It can stipulate that the increases in fare are subject to review at any future time whenever, in particular cases, it is demonstrated that abnormal earnings are produced. Other means can be used which will prevent abuses. A wise constructive course of action is unmistakably to grant immediate relief while, at the same time, stipulating such conditions as, in the judgment of the commission, are necessary to protect the public interest.

Municipal Regulation of Street Railways*

Most Satisfactory Regulation Is That Involving Minimum Interference with Details of Operation—Methods of Determining Adequacy of Service Are Analyzed

By J. W. McCLOY

Service and Equipment Inspector Public Utilities Department, Seattle, Wash.

THE question as to whether the function of regulatory control should be exercised by state or municipal authorities is a live one at present. While the preponderance of opinion among the operating companies favors the former, an undoubted majority of the residents of the larger cities incline toward the latter. The "home rule" agitation is not entirely a creature of the imagination of certain municipal officeholders seeking to broaden their authority. If municipal authorities have not always displayed a proper regard for the financial responsibilities of the traction companies; if local municipal politics have occasionally played too important a part in influencing decisions; and if the policies of municipal governing bodies and the personnel of their members have been subject to frequent change, it can with equal force be asserted that state boards have been subject to the same limitations.

The question of priority of authority can by no means be said to be definitely settled, and a great deal must depend upon the results obtained within the next few years by the two schools of thought. It is probable that municipalities will always reserve the purely police powers to themselves, but beyond the matters subject to ordinary police control is a whole realm of corporate activity affecting in a most vital way thousands of persons. How to exercise a fair and reasonable regulatory authority which will produce the best results for all concerned is the question.

METHODS OF DETERMINING ADEQUACY OF SERVICE

Time was when the traction officials used to meet complaints of inadequate service by quoting statistics purporting to show the earnings per car-mile or per car-hour of the line of which complaint was made, and of comparing this showing with similar data of some other line apparently more favored from the standpoint of service. It was usually easy enough to demonstrate that the earnings of the longer lines, on which the heaviest crowding occurred, were comparatively less than the earnings on the short-haul lines, and an argument of this sort was generally looked upon as final and conclusive. Until a few years ago the average street railway management did not pretend to know the per cent of passengers obliged to stand during the rush hours on the various lines composing their systems. Out of this lack of knowledge, coupled with the fact that the stock arguments against increasing the service were beginning to fail, grew the method of determining the adequacy of service by means of the traffic count. The first crude efforts along this line were confined to a study of the conductor's trip sheets, the various classes of fares shown in the total columns of each half trip being added together to show the volume of travel. In this manner all passengers who had been on the car during its half trip were shown in the totals, which were laboriously platted into curves and turned over to the traffic department for the purposes of study. It will be apparent at once that such data were worse than useless, as while many a car might show a heavy total for its half-trip passenger record, such a total would bear little relation to the number of passengers who might have been on the car at any one time.

This method was improved upon by stationing inspectors in the street at the point of maximum load to record the car movements and to estimate to the best of their ability the number of passengers on board. Another method of obtaining the same data is to require the conductor to make a count of his passengers upon arriving at the point of maximum load, recording the result, together with the time at which the car arrived at the point in question upon a blank provided for the purpose. As between the two methods of securing the count, either by street inspector or by the conductor on the car, there is little choice from the standpoint of accuracy; the latter method, however, having the advantage of being the less expensive. In either event when the results are assembled and tabulated and a comparison is arrived at showing the ratio between the passengers carried and the seats furnished, a very interesting record is obtained and the movement and characteristics of traffic can be studied to a nicety.

During the off-peak periods of travel the averages will seldom show a preponderance of standing loads, as it is an almost universal practice in American cities to provide a considerable surplus of seats over passengers during these periods. An exception will usually prevail on Saturday nights when homeward-bound travel will be found to be very heavy far into the hours of the night.

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*Abstract of address delivered before an Extension Class of the University of Washington.

It is during the morning and evening rush periods, which will embrace, roughly, the hours between 6.30 a. m. and 9 a. m. and between 4.45 p. m. and 6.45 p. m., that the overcrowding which usually prevails on cars moving in the controlling direction of traffic constitutes the reproach which is so often fastened upon American cities when comparisons are drawn with cities of Europe. To overcome this overcrowding or at least to reduce it to its lowest possible minimum is the primary aim of service regulation.

DEFINITIONS OF ADEQUATE SERVICE

Franchise provisions and legislative acts affecting urban street railway service usually contain general provisions to the effect that service shall be "safe, adequate and sufficient," "shall meet the requirements of public convenience and necessity," etc.—terms capable of widely divergent interpretations. Unfortunately, the word "rational" seldom finds its way into these orders, whence arise inevitable disagreements, conflicting orders and unhappiness all around, both among those issuing the orders and those upon whom falls the burden of carrying them out.

In determining what constitutes a "comfortable load" an element of pure judgment arises at the outset. One authority seems to have said about all that it is possible to say in stating that "a comfortable load is such that every person under average normal conditions who desires a seat may have one; while those who desire to stand of their own initiative may do so in comfort." Needless to say such a factor as this will be subject to a variation in which the type of car and the rules of the company will play a part. For instance, persons who would not care to stand at the rear of the car might choose to stand on the front platform in friendly converse with the motorman, but this the company's rules might prohibit. But without attempting to be captious the definition above set forth appears to meet the average situation.

The element of time must needs play an important part in evolving a definition of a "convenient service," and here also psychology must play a part. On a long suburban line a fifteen-minute headway between cars might not appear unreasonable, might indeed be deemed of great advantage to the district served, but on a line serving one of the closer-in residence districts a wait of fifteen minutes between cars would be deemed outrageous, even if the average passenger load on the longer line were the heavier of the two. The divisibility of the headway into the hourly period is also important from a convenience standpoint; a fifteen-minute headway is preferable to a thirteen-minute headway; a thirty-minute headway is preferable to a twenty-five-minute headway, for the reason that the patron, once he obtains his bearings, so to say, can figure out with reasonable exactness when to look for a car. Where the headway is less than twelve minutes the matter is not of sufficient importance to receive special attention, as the wait between cars will be relatively short at the most. Where the headway is longer than thirty minutes and is still at an odd figure, such as thirty-five minutes, an effort should be made to distribute printed copies of the schedule among the regular patrons.

PROPER THEORIES OF SCHEDULE MAKING

From time to time some commission arrogates to itself the function of drawing up or prescribing operating schedules, but such attempts have almost invariably resulted in confusion and failure. It can be set down as axiomatic that schedule making is a function which belongs peculiarly and alone to the operating department of a street railway, and any interference from outside sources is likely to be disastrous. In the long run it will be found that the most satisfactory regulation will be that which involves the minimum of interference with details of operation.

Regulating commissions have also all too commonly fallen into the error of prescribing maximum loads. While this may be a splendid idea in theory, it is very difficult to apply in practice. The burden of determining when the maximum load has been reached must necessarily devolve upon the conductor, and he is too likely to be otherwise busily engaged when the moment of overload arrives. If the responsibility of limiting the load is put up to some outside authority, it can mean nothing more than a heavy increase in the supervisory expenses of the community, the regulating board or the traction company upon whom, as the case may be, the duty falls. It is a much simpler proposition to provide "car full" signs and leave the matter of their use up to the conductors. With a little coaching the car men should soon become sufficiently well informed to use the signs wisely.

A more sensible and generally accepted method of defining a reasonably adequate service is to set forth a ratio between the number of seats furnished and the number of passengers carried in the controlling direction of traffic during the various periods of the day. This method is now being substantially followed in a number of cities where regulation is most successfully practised and undoubtedly forms the basis upon which all future regulations must be worked out.

It would be a poor service standard order that was not sufficiently flexible to meet the extraordinary conditions which constantly arise in a large city. Physical conditions will often intervene to prevent the maintenance of a set car-loading standard. In many cities—in fact, on certain lines in Seattle—the problem of street congestion is an important factor in limiting car service. Even at the present time, with every prospect of a vast increase in the number of people to be handled, the limit of car movement has practically been reached along First Avenue South for certain short periods during the morning rush hours. In such cases it would, of course, be futile to seek to enforce a service standard equal to that which would apply on other lines under more favorable conditions.

In regulation there is always a far wider field for substantial constructive work than for mere criticism. Good car service implies regularity of headway above everything else, and in insuring this regularity a properly constituted regulatory authority can often accomplish substantial results where even the most able and conscientious operating official would fail. In this field the odds are heavily in favor of municipal as opposed to state control over regulation. In theory, at least, a municipal authority is in closer touch with the local police upon whom rests the final responsibility for facilitating traffic. The fact that this theory is not always applied in practice does not argue against its soundness.

The Department of Public Utilities in Seattle has exerted itself in securing the enactment of certain legislation designed to expedite street railway traffic, and has always stood ready to sponsor any legitimate suggestion which would tend to improve service conditions. Frequent conferences are held between representatives of the department and the traction companies, at which there is a free and helpful exchange of criticism and suggestion. The local traction officials have a wholesome respect for any suggestion emanating from the department, and it is safe to say that more real benefits for the traveling public have been brought about through the agency of friendly conferences than would have been possible by any amount of appeal to legal recourse.

AMERICAN ASSOCIATION NEWS

Manila Section Discusses Lighting

At the meeting of Section No. 5 held in Manila on May 8, F. J. Tew, superintendent of shops, was elected director for two years, and four men from the transportation department were elected to membership. The paper of the evening was by Arthur J. Grant, superintendent of lighting and power installations, on "Lighting," and the discussion related principally to local problems, particularly with reference to meter accuracy.

Section No. 7 Meets in Middletown, Conn.

The sixteenth monthly meeting of the Connecticut Company section was held under the auspices of the Middletown division on May 23, with an attendance of 149. After dinner and a musical program the meeting was turned over to F. A. Hewitt, superintendent of the division.

The formal program comprised an address of welcome by Mayor H. M. Meech of Middletown; a paper on "Car Painting—Past and Present," by Andrew MacGreagor, master painter Meriden division; an address on "The Chamber of Commerce of Connecticut, with Special Reference to Its Recent Report on Taxation," by George Burnham, president of the Chamber, and an address by Prof. H. M. Wriston of Wesleyan University, on "The Relations of the Government to the Railways."

Mr. Meech referred especially to the courtesy that is always extended to committees representing the city of Middletown in their conferences with the officials of the Connecticut Company. Mr. MacGreagor told in a humorous manner the differences in the methods of painting trolley cars to-day as compared with those of 1870. Mr. Burnham mentioned the unfairness of the paving tax assessed against railway companies now, due to certain charter rights that were given to the companies years ago when horse cars were in operation. He explained that this form of tax would presumably be eliminated in the near future, but that a proper tax would be levied in its place. Professor Wriston cited railway conditions in this country compared with those in England and France. He said that abroad public ownership did not work out any better than private ownership and, owing to conditions in this country, it appeared that private ownership is better.

Railway Signal Association Meets

A stated meeting of the Railway Signal Association was held in New York on June 12-13, 1917, reports being presented by standing committees on signaling practice, mechanical interlocking, power interlocking, d. c. automatic block, standard designs, direct-current relays, and alternating-current signaling. Reports were also submitted by special committees on harmonizing specifications and on the signaling requirements of electric railways. The latter committee reported progress only, and confined itself to the statement that it was prepared to co-operate with the American Electric Railway Association, whose committee on block signals is endeavoring to have the two associations consider jointly the matter of block-signal rules, and is preparing recommendations as to certain changes in R. S. A. standards that would be desirable from the standpoint of electric railways. The committee felt that considerable progress had already been made in the way of co-operation between the two associations and toward the adoption of joint standards by both.

Big Cottonwood Demolishes One-Man Car

One of the one-man cars of the Topeka (Kan.) Railway will be in the shop for a few weeks due to the accident depicted in the accompanying photograph. A cyclone passed near Topeka on June 5 and the wind in the city was sufficiently strong to blow over a cottonwood tree which struck the front hood of the car. The conductor and one passenger were slightly injured. The cyclone killed eight people elsewhere and destroyed property valued at $700,000.

VIEW SHOWING THE EFFECT OF THE CYCLONE AT TOPEKA, KAN.

New York State Conference on Six-Cent Fare

Representatives of 80 per cent of the electric railways in up-State New York, under the jurisdiction of the Public Service Commission for the Second District, met in Syracuse on June 12 to help map out definitely a campaign for increased fares on city lines. The meeting was held under the direction of the up-State division of the committee of ten appointed by the New York Electric Railway Association to consider ways and means of increasing revenues.

As before stated in the ELECTRIC RAILWAY JOURNAL, the companies in the First District, or New York City, have in the main already applied for permission to charge for transfers. The exact course to be followed by the up-State companies has not been finally determined, but their general views as expressed to the committee seemed to be in favor of making a flat increase of 1 cent so as to charge a 6-cent fare on city lines. One small company suggested that it would require a 7-cent fare. There was also some discussion as to the advisability of seeking relief from certain operating burdens, especially from paving and snow-removal charges and some forms of taxation.

It was stated at the close of the session that each company was to outline its needs, and that some general plan would be devised to place before the up-State commission. It is expected that petitions for permission to charge higher fares will soon be filed in Albany.

Joseph K. Choate, vice-president J. G. White Management Corporation, New York, N. Y., presided at the meeting as chairman of the association committee. Thomas Conway, Jr., Ph.D., professor of finance, University of Pennsylvania, Philadelphia, Pa., addressed the railway men on the economic side of the present situation, and Martin S. Decker, formerly a public service commissioner in the Second District, also spoke as a representative of some of the companies. Ivy L. Lee, who will be in charge of publicity in connection with the movement for increased fares, was present at the meeting.

COMMUNICATION

Advocates Springs Over Journal Boxes

New York, May 25, 1917.

To the Editors:

In the several communications that you have recently published on truck equalization, those of Messrs. Phillips and Pittenger, which appeared in the issue of May 12, are of particular interest in connection with equipment for city service. The writer agrees with both in part but also takes issue with both on certain points.

The arch-bar truck that is advocated by Mr. Phillips is light in weight, it is true. But sound construction has been sacrificed for this weight reduction. As there is no journal cushion, the frame outside of the bolster springs is subject to strain and torsion, and this brings about the difficulties referred to by Mr. Pittenger.

Mr. Phillips says further that the side frame and transom of the arch-bar truck have a knife-edged connection. This is true, but at this point the truck has an insufficient lateral connection. There is no transverse bracing and the truck becomes skewed, giving the wheels a tendency to hug the rails and causing stress in the truck frame. The connections work loose, and the nuts are shaken off, while excessive power is required to propel the car. Doubtless some of these ill effects are transmitted to the car body and to the track.

As to the good riding qualities of the arch-bar type of truck, the writer must differ with Mr. Phillips, since he was in Pittsburgh when these trucks were placed under trailers. The riding qualities were such that it seemed unlikely that they would be used under motor cars or considered for permanent equipment.

With the pedestal type of truck, which is advocated by Mr. Pittenger, the reduced maintenance is partly due, no doubt, to method of construction rather than to type. Machine-fitted bolts and similar applications of high-grade workmanship contribute materially to resist racking due to poor track, although at the same time, the equalizer-bar truck with the cushion placed quite close to the journals has an advantage over the design where the motors are journaled to the axle without cushion of any kind.

However, the writer believes that better results can be obtained without the equalizing bar by placing the springs directly upon the journal boxes. This saves the weight of the equalizer bars and eliminates the uncushioned dead weight on the journal box, as well as the rattling noise referred to by Mr. Phillips in his communication. The equalizing bar at best is a relic of the wooden truck, and when wooden trucks were used it was valuable because it prevented the wooden truck beam from breaking down. With this design the points of support at the equalizing springs were placed nearer to the center of the beam, thus making the equalizing bar carry part of the load between journals.

Another point in favor of using springs over journal boxes is that this provides a design where the brake head and shoe are clear of obstruction, and inspection and repairs are facilitated in comparison with the design where equalizing bars are used.

John Francis.

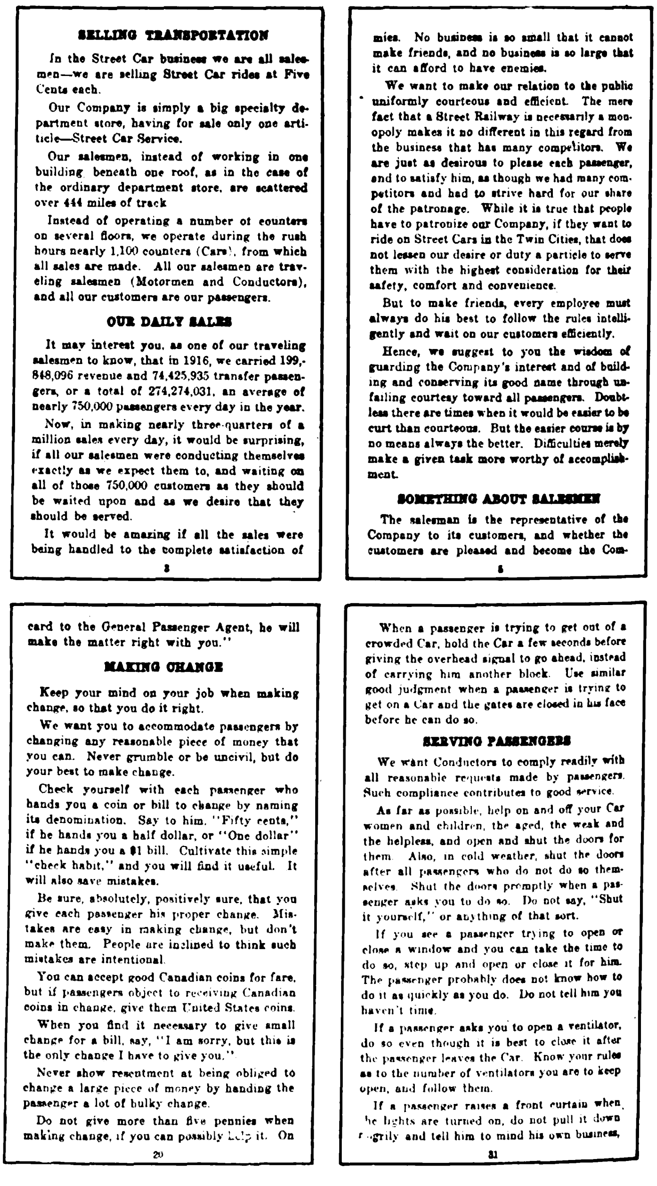
The Union Traction Company, Coffeyville, Kan., has installed a steam locomotive on its 24-mile line to Nowata, Okla., to take care of the increased freight traffic, the present electrical equipment of the company not being equal to handling the unusual increase. The steam locomotive makes two trips each way a day.

Selling Rides in Minneapolis

Company Issues to Its Employees a Pamphlet Containing Practical Suggestions on How to Treat the Public

The Twin City Rapid Transit Company has recently issued to all trainmen a pamphlet of forty-four pages containing suggestions on how they should carry on their daily work. The pamphlet is not a rule book but rather a short treatise on "selling rides." It compares the company to the merchant and the employees to the salesmen, and the idea expressed is that both merchant and salesmen should see that the customers are satisfied with their purchases. The pamphlet is not intended as a substitute for the rule book, but to instill the proper spirit of public service in the men to whom it is addressed.

The introduction, which is signed by President Lowry, says that the suggestions in the pamphlet were compiled by A. W. Warnock, general passenger agent, with the single educational purpose in mind of explaining "What to do and how to do it" in order to give patrons the best possible street car service. Typical pages of this pamphlet are shown in the illustration below.



SELLING TRANSPORTATION

In the Street Car business we are all salesmen—we are selling Street Car rides at Five Cents each.

Our Company is simply a big specialty department store, having for sale only one article—Street Car Service.

Our salesmen, instead of working in one building beneath one roof, as in the case of the ordinary department store, are scattered over 444 miles of track

Instead of operating a number of counters on several floors, we operate during the rush hours nearly 1,100 counters (Cars), from which all sales are made. All our salesmen are traveling salesmen (Motormen and Conductors), and all our customers are our passengers.

OUR DAILY SALES

It may interest you, as one of our traveling salesmen to know, that in 1916, we carried 199,848,096 revenue and 74,425,935 transfer passengers, or a total of 274,274,031, an average of nearly 750,000 passengers every day in the year.

Now, in making nearly three-quarters of a million sales every day, it would be surprising, if all our salesmen were conducting themselves exactly as we expect them to, and waiting on all of those 750,000 customers as they should be waited upon and as we desire that they should be served.

It would be amazing if all the sales were being handled to the complete satisfaction of

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mies. No business is so small that it cannot make friends, and no business is so large that it can afford to have enemies.

We want to make our relation to the public uniformly courteous and efficient. The mere fact that a Street Railway is necessarily a monopoly makes it no different in this regard from the business that has many competitors. We are just as desirous to please each passenger, and to satisfy him, as though we had many competitors and had to strive hard for our share of the patronage. While it is true that people have to patronize our Company, if they want to ride on Street Cars in the Twin Cities, that does not lessen our desire or duty a particle to serve them with the highest consideration for their safety, comfort and convenience.

But to make friends, every employee must always do his best to follow the rules intelligently and wait on our customers efficiently.

Hence, we suggest to you the wisdom of guarding the Company's interest and of building and conserving its good name through unfailing courtesy toward all passengers. Doubtless there are times when it would be easier to be curt than courteous. But the easier course is by no means always the better. Difficulties merely make a given task more worthy of accomplishment.

SOMETHING ABOUT SALESMEN

The salesman is the representative of the Company to its customers, and whether the customers are pleased and become the Com-

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card to the General Passenger Agent, he will make the matter right with you."

MAKING CHANGE

Keep your mind on your job when making change, so that you do it right.

We want you to accommodate passengers by changing any reasonable piece of money that you can. Never grumble or be uncivil, but do your best to make change.

Check yourself with each passenger who hands you a coin or bill to change by naming its denomination. Say to him, "Fifty cents," if he hands you a half dollar, or "One dollar" if he hands you a $1 bill. Cultivate this simple "check habit," and you will find it useful. It will also save mistakes.

Be sure, absolutely, positively sure, that you give each passenger his proper change. Mistakes are easy in making change, but don't make them. People are inclined to think such mistakes are intentional.

You can accept good Canadian coins for fare, but if passengers object to receiving Canadian coins in change, give them United States coins.

When you find it necessary to give small change for a bill, say, "I am sorry, but this is the only change I have to give you."

Never show resentment at being obliged to change a large piece of money by handing the passenger a lot of bulky change.

Do not give more than five pennies when making change, if you can possibly help it. On

20

When a passenger is trying to get out of a crowded Car, hold the Car a few seconds before giving the overhead signal to go ahead, instead of carrying him another block. Use similar good judgment when a passenger is trying to get on a Car and the gates are closed in his face before he can do so.

SERVING PASSENGERS

We want Conductors to comply readily with all reasonable requests made by passengers. Such compliance contributes to good service.

As far as possible, help on and off your Car women and children, the aged, the weak and the helpless, and open and shut the doors for them. Also, in cold weather, shut the doors after all passengers who do not do so themselves. Shut the doors promptly when a passenger asks you to do so. Do not say, "Shut it yourself," or anything of that sort.

If you see a passenger trying to open or close a window and you can take the time to do so, step up and open or close it for him. The passenger probably does not know how to do it as quickly as you do. Do not tell him you haven't time.

If a passenger asks you to open a ventilator, do so even though it is best to close it after the passenger leaves the Car. Know your rules as to the number of ventilators you are to keep open, and follow them.

If a passenger raises a front curtain when he lights are turned on, do not pull it down angrily and tell him to mind his own business,

21

PAGES FROM PAMPHLET ISSUED BY THE TWIN CITY RAPID TRANSIT COMPANY

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Electric Railway's Own Forces Construct and Erect Bridge

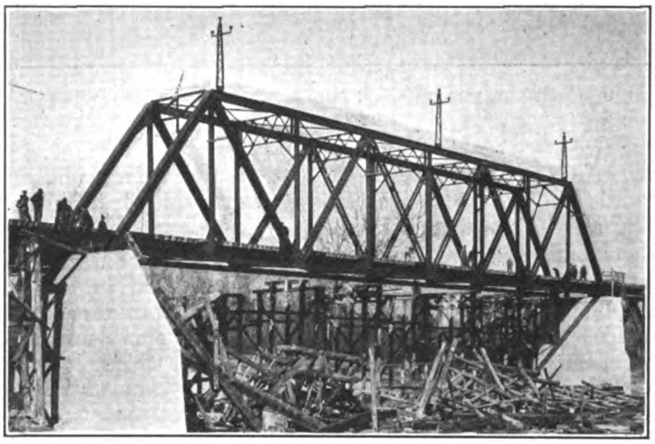
Fort Wayne & Northern Indiana Traction Company Builds 181-Ft. Steel Warren Truss Without Accident to Employees

BY H. V. NORFORD

Superintendent of Maintenance of Way Fort Wayne & Northern Indiana Traction Company

The design and construction of a 181-ft. steel span over Wild Cat Creek has been accomplished by the Fort Wayne & Northern Indiana Traction Company's own departments without an accident or an injury during the whole of the eight months of hazardous work. Every detail of the span fitted as designed, and the construction was accomplished without borrowing or renting any outside equipment. When everything was in readiness the wrecking of the 181-ft. operative trestle, the moving of the new span into place, and the hooking up of the rails and the overhead wires consumed only one hour and fifty-one minutes, in spite of the fact that the faster jacks of sufficient capacity to move a span of that weight were not available. The wrecking of this trestle and throwing it in the clear took but twenty-six minutes.

The construction previously in use consisted of three 100-ft. deck truss spans resting on concrete piers and two pile trestle approaches with lengths of 795 ft. and 375 ft. respectively. As many of the piles of the 795-ft. or east approach trestle were in bad condition, it was decided to replace this trestle with an earth fill and a steel span, with the exception of a short space at the shore end where it passed over a roadway. This replacement necessitated an embankment totaling 44,500 cu. yd., which was taken from a near-by gravel and sand pit and hauled in 40-cu. yd. gondolas with false bottoms and side doors. By this method an average of 547 cu. yd. per ten-hour day was placed and a maximum of 806 cu. yd. was attained. When the embankment had been raised and the material had been piled above the track sufficiently high to form an embankment with an 18-ft. top, and side slopes of 1½ to 1, a V-board equipped with iron friction shoes was pushed ahead of a gondola truck and the top was prepared for the placing of the ties.

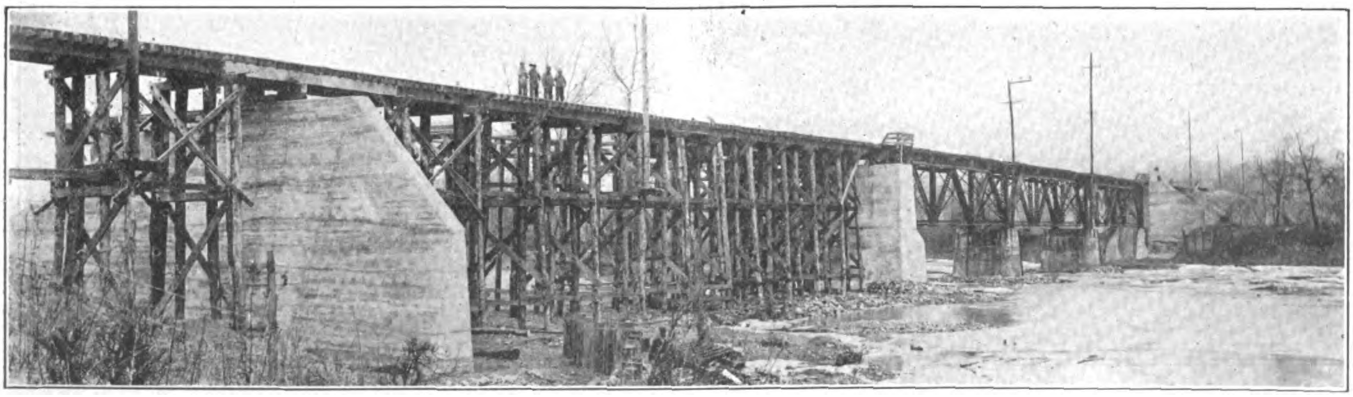


RIVETING THE NEARLY-COMPLETED SPAN ON WILD CAT CREEK BRIDGE

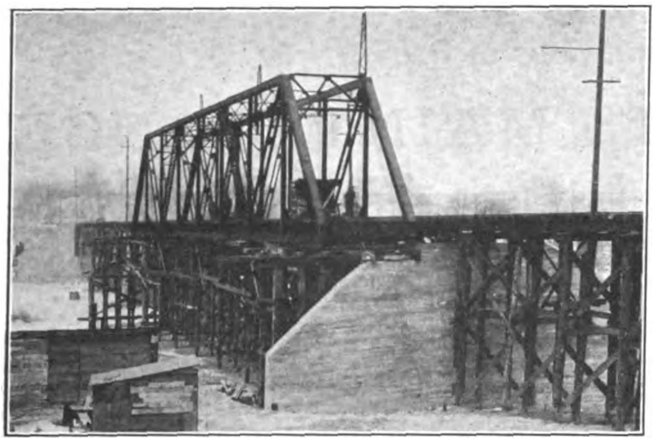
The temporary falsework, shown in the accompanying illustrations, was erected so as to place the center line of the steel span 15 ft. from the center line of the operative trestle. Single bents were driven under each of the intermediate panel points and pile piers were driven under the end shoes. The construction was necessarily such as to be reasonably safe against floods and ice.

The steel span is a riveted Warren truss 181 ft. 8 in. in length with inside clearances of 14 ft. in width and 19 ft. in height. After the steel members had been loaded on flat cars by the company's bridge force and transported to the site the span was erected on the falsework by a derrick car constructed by the company. This derrick car has a 37½-ft. boom capable of lifting 45,000 lb.

When the erecting and riveting of the steel members had been completed the span was decked with 7-in. x 9-in. x 10-ft. ties and 6-in. x 8-in. timber guards, both



VIEW OF OPERATIVE TRESTLE OVER WILD CAT CREEK ON LINE OF FORT WAYNE & NORTHERN INDIANA TRACTION COMPANY



HOOKING-UP THE WILD CAT CREEK BRIDGE FOR RESUMPTION OF TRAFFIC

of white oak, and rails, cut to fit the corresponding joints on the operative trestle, were spiked in place. The single bents under the span were then cut in the clear, and the span was made ready to be moved in place. After the span was placed, and the operative trestle wrecked, it was found that the grade and alignment had been so maintained that a change of shoes was unnecessary, the rail for the false shoes being cut off within the limits of the abutments and covered with concrete for anchorage.

Large Steel Sheets Drilled by Aid of Home-Made Carriage

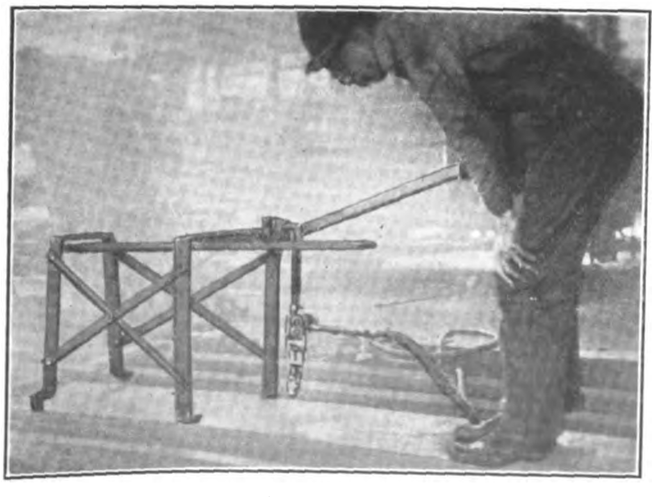
BY G. B. SISSON

Mechanical Department Georgia Railway & Power Company, Atlanta, Ga.

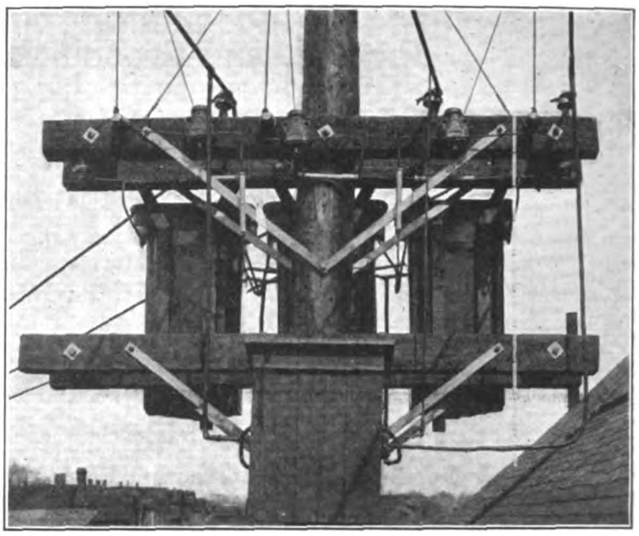
To avoid the trouble and expense of handling long steel sheets over a drill press, a pneumatic drill supported by a home-made carriage is used in our shops for making these holes.

The carriage has a very wide range over which to operate, being arranged to slide lengthways of the sheets while the drill itself can be moved back and forth across the sheets. There is a lever by which hand pressure is exerted on the drill, and when this pressure is released a coiled spring raises the drill out of the work and it is ready for the next hole.

This device allows the sheets to lie flat at all times, and, as it can be operated by one man, it saves a great deal of the labor in handling the long sheets.



CARRIAGE FOR DRILLING LARGE STEEL SHEETS

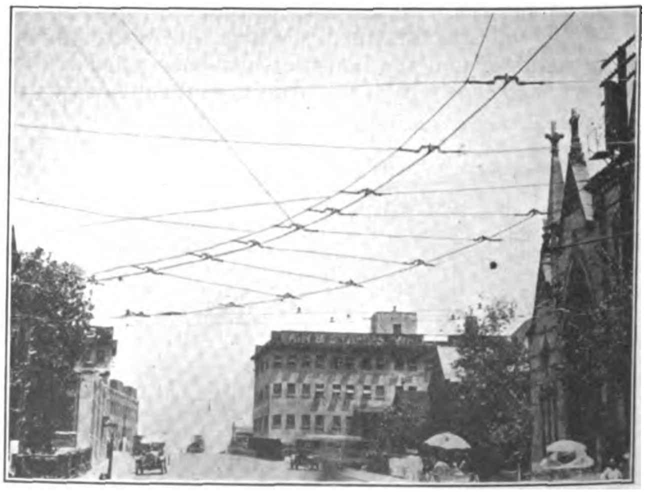


WIRING OF TRANSFORMERS CRITICISED BECAUSE THE LEAD ON RIGHT WAS TOO LONG

Linemen Criticise Each Others' Work by Aid of Photographs

Most of the jobs carried out by linemen are made in locations which are not readily accessible for inspection so that careless work cannot readily be detected, especially if reliance is placed upon binoculars alone. On the Georgia Railway & Power Company's lines, however, the linemen are so interested in their work that they request that photographs be taken of any job of which they are particularly proud. These jobs, naturally, are the more complicated ones and the very kind that ought to be done perfectly. After the photographs are taken they are framed and hung in the trouble stations. Here they receive the "once-over" by the linemen, and a job must be remarkably good to escape criticism.

One of the accompanying illustrations shows a curve at Washington and Hunter Streets, Atlanta, and proves that the crew that put up this construction had a right to glory in its achievement. On the other hand, when a lineman saw the pole transformer job also illustrated, he said to his fellow-worker: "Didn't I tell you, Bill, that the center lead was too long to get a straight wire?" T. F. Johnson, superintendent of transmission, finds that this self-criticism is more effective discipline than any scoldings. The men have simply learned to take such pride in their work that they do everything possible to earn praise instead of blame.



UNUSUALLY GOOD TROLLEY CONSTRUCTION, ATLANTA, GA.

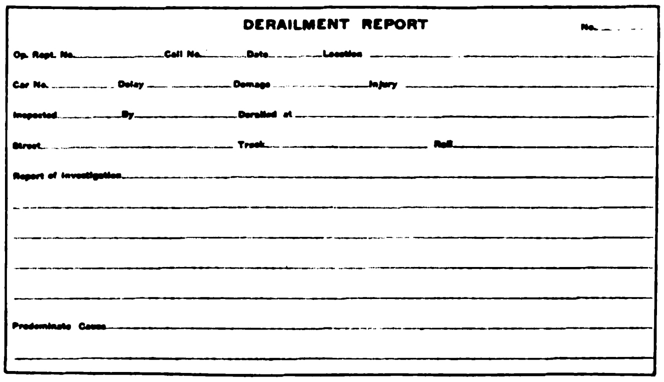
Derailments Reduced by Investigation, Classification and Study of Causes

BY M. BERNARD

Assistant Engineer Way and Structure Department Brooklyn Rapid Transit Company, Brooklyn, N. Y.

As careful investigation and classification of derailments has led to a marked reduction in the number of these accidents on this property it may be of interest to outline the method by which these records are handled.

The operating department reports each derailment to the engineer of surface lines who orders an investigation, the result of which is reported to the engineer of way and structure on the form shown in one of the accompanying illustrations. These reports cover all occurrences which can be called derailments whether serious or trivial in their relation to delay of traffic or damage. In the way and structure department these reports are classified monthly according to the causes, the form shown in the illustration below being used. A graphical record is also kept of the different causes of derailment. The graphs reproduced herewith show the proportion of the girder rail derailments to the total, and also show that the whole number of derailments is being greatly reduced. The record is for the total surface single-track mileage of our system, which is about 535.



DERAILMENT REPORT

No. ____

Op. Rept. No. ____ Call No. ____ Date ____ Location ____

Car No. ____ Delay ____ Damage ____ Injury ____

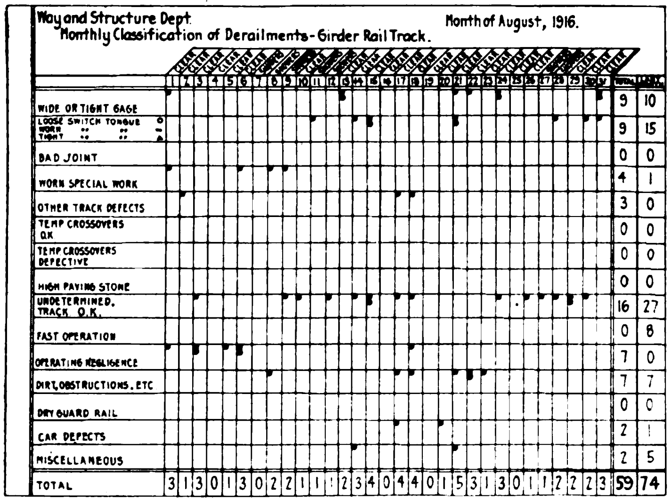
Inspected ____ By ____ Derailed at ____

Street ____ Track ____ Rail ____

Report of Investigation ____

Predominate Cause ____

BLANK USED IN REPORTING DERAILMENTS

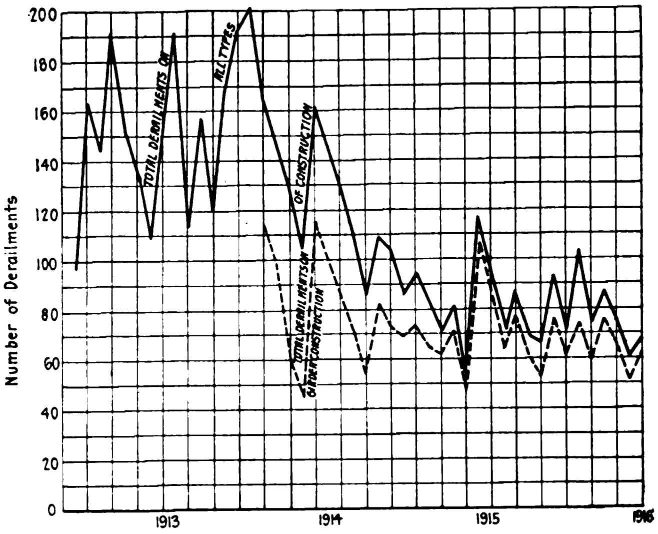


Way and Structure Dept.
Monthly Classification of Derailments - Girder Rail Track.
Month of August, 1916.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL	[illegible]
WIDE OR TIGHT GAGE																																9	10
LOOSE SWITCH TONGUE ○ WORN " " ▬ TIGHT " " ▲																																9	15
BAD JOINT																																0	0
WORN SPECIAL WORK																																4	1
OTHER TRACK DEFECTS																																3	0
TEMP CROSSOVERS O.K.																																0	0
TEMP CROSSOVERS DEFECTIVE																																0	0
HIGH PAVING STONE																																0	0
UNDETERMINED, TRACK O.K.																																16	27
FAST OPERATION																																0	8
OPERATING NEGLIGENCE																																7	0
DIRT, OBSTRUCTIONS, ETC																																7	7
DRY GUARD RAIL																																0	0
CAR DEFECTS																																2	1
MISCELLANEOUS																																2	5
TOTAL	3	1	3	0	1	3	0	2	2	1	1	1	2	3	4	0	4	4	0	1	5	3	1	3	0	1	1	2	2	2	3	59	74

MONTHLY CLASSIFICATION OF DERAILMENTS OCCURRING ON GIRDER TRACK CONSTRUCTION

In addition to the information furnished by the formal report, all unusual track conditions likely to lead to derailments are telephoned promptly to the engineer of surface lines, who has them entered on log sheets and promptly investigated and improved. Should there be repeated derailments at any one location a special investigation is made by a derailment committee consisting of one member each from the operating, mechanical and way and structure departments. The reduction in the number of derailments on this property is undoubtedly due partly to the efforts of the derailment committee and partly to the closer inspection methods now in use. Prompt repairs are also made where conditions are reported as likely to lead to derailment.

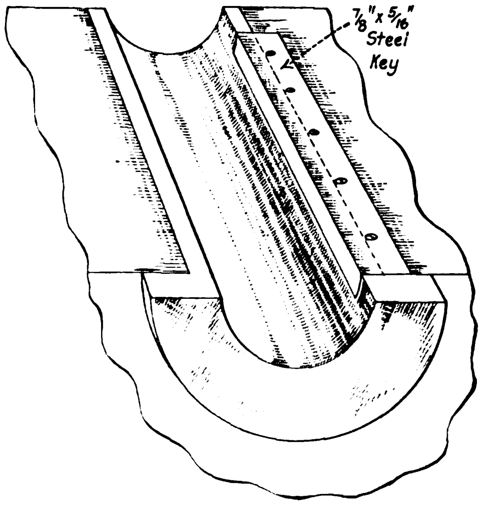


GRAPH SHOWING TOTAL DERAILMENTS AND GIRDER RAIL DERAILMENTS FOR 535 SINGLE-TRACK MILES

In conclusion it may be said that a close study of derailments should tend generally not only toward a reduction in their number, but also toward possible improvements in construction.

Keying Bearing Brasses Eliminates Dowel Pins

A method of keying motor bearing brasses to their housings, thus doing away with the necessity for dowel pins, has been used with good success by H. C. Kaercher, master mechanic Elmira Water, Light & Railroad Company. The accompanying sketch shows how this is done. The key is a piece of 7/8-in. x 5/16-in. steel fastened into a recess in the bearing housing by countersunk screws. The brass is notched out to fit the key.



BEARING BRASS KEYED TO HOUSING

Before a key was used a great deal of trouble was experienced from the dowel pin and hole in the brass becoming so worn that the bearing was allowed to slide around until it often cut off the oil supply entirely.

Substation Operating Rules

Oregon Electric Railway

The following instructions have been in force for some time on the 1200-volt Oregon Electric Railway lines, Portland, Ore. E. R. Cunningham, electrical superintendent, advises that these rules have given very satisfactory results.

Instructions to Substation Operators

Before taking charge of a substation, all operators must learn location of all switches, wires, cables, conductors and current-carrying parts of station that are dangerous and must be avoided.

He must learn names, nature and use of all machines, switches, instruments and various parts of apparatus, and how to operate them under all ordinary and emergency conditions.

He must learn how to clean, repair and properly care for them so as to keep them in good condition and secure best efficiency and operating results from his station.

All operators will be required to pass a rigid examination before taking charge of a substation. The following instructions are intended to assist old as well as new operators as far as possible in the work of operating their station so as to attain best results.

It is difficult to cover all cases of emergency by printed instructions, and operators should avail themselves of every opportunity at their command to acquire a practical working knowledge of apparatus which they have to handle, and when in doubt should ask for necessary information before doing the wrong thing.

It is just as essential to learn what not to do as it is to learn what to do. Operators are especially instructed to familiarize themselves with the "don'ts" in the following instructions:

How to Start a Rotary Converter

1. See that all starting switches are open. (On the 1200-volt rotaries see that d.c. brushes are raised.)

2. Close a.c. high-tension oil switch. (On 1200-volt rotaries first close field break-up switch in upward position.)

3. Close a.c. starting switch in upward position. (In case of six-phase machines with tandem switches, both a.c. starting switches should be closed in up position.) The machine will then come to speed and lock in step, which will be indicated by cessation of beats or vibration of the d.c. voltmeter. If d.c. voltmeter does not come up in the right direction, close field break-up reversing switch in downward position until voltmeter comes back to zero, then open and wait for voltage to come up in right direction. If it does not come up in right direction, repeat the above process until it does.

4. When voltage as indicated by d.c. voltmeter comes up in right direction, throw a.c. starting switch quickly from up to bottom position. (With six-phase rotaries, having tandem starting switches, throw left-hand a.c. starting switch down quickly to bottom contacts, then throw right-hand a.c. starting switch down quickly to bottom contacts.)

5. On 1200-volt rotaries lower d.c. brushes.

6. Adjust d.c. voltage to approximately that of bus-bars.

7. Push up low-voltage release of circuit-breaker and close circuit-breaker.

8. Close main rotary switch.

9. Adjust division of loads between machines, if more than one is in service, by means of rheostats. Observe power factor meter and adjust fields of rotaries by means of rheostats so as to keep power factor as near 100 per cent as possible.

How to Shut Down a Rotary Converter

1. Open d.c. rotary circuit-breaker. (It is advisable to open d.c. rotary circuit breaker by throwing the speed-limit switch on end of rotary when shutting down in order to keep speed-limit and low voltage release device working properly.)

2. Open main rotary switch.

3. Open high-tension a.c. oil switch. (Allow voltage to run down below 100 before opening field break-up switch.)

4. Open field break-up switch.

5. Open a.c. starting switch.

6. On 1200-volt rotaries raise d.c. brushes.

7. After voltage has dropped below 100 and field switch and starting switch have been opened, it is advisable to wipe commutator with a clean cloth while armature is still coasting.

Treatment of Commutator and Brushes

Commutator should be cleaned with canvas or cheesecloth wiper only. *Gasoline must not be used.*

No free oil of any kind must be used, but when necessary, commutator should be cleaned and sufficiently lubricated by wiping with clean cloth moistened in good grade of clean, light oil.

When necessary to wipe commutator while in operation, it must be done by means of cloth on end of dry stick at least 4 ft. long and it is always advisable to do it at such times when there is little or no load on rotary, when d.c. breaker may be opened to prevent flashover.

Whenever machine is shut down, the commutator should be wiped off thoroughly, d.c. brushes taken out of their holders, and wiped off and inside of holders wiped out. This should be done daily, or as often as it is necessary to keep brushes working freely in their holders.

The secret of good commutation is in keeping brushes working freely in brush holders, and making good uninterrupted contact with the commutator. If this is done and commutator is kept clean, it will rapidly acquire highly polished surface of chocolate brown color and require much less attention and care than when neglected and allowed to get rough.

When it becomes necessary to sand the commutator, it must only be done when the machine is coasting with the brushes raised and all starting switches out.

After it has been sanded sufficiently, it must be finished by applying No. 00 sandpaper, backed with felting or other suitable padding.

Sandpaper should be oiled on back with machine oil to prevent copper fragments from being imbedded in mica. Surface of commutator should be polished with strip of canvas.

When brushes are changed or commutators sanded, brushes must be fitted to commutator by inserting piece of sandpaper under brush and drawing it back and forth, following the curvature of armature with smooth side of paper bearing on commutator and sanded side on brush. After sanding, machine should be thoroughly blown out with hand bellows and all parts wiped clean.

If commutator, brushes and holders and all parts are properly cleaned and cared for it should not be necessary to sand, turn or grind commutator, under ordinary conditions.

The safety of operators and machinery will be increased if the following "Don'ts" are observed:

Don'ts

Don't open field break-up switch until machine voltage has run down below 100.

Don't open starting switches until machine voltage has run down to zero.

Don't open a.c. oil switch with starting switch on starting taps, when field switch is closed and armature revolving, as this would tend to build up voltage on transformers considerably above normal.

Don't close a.c. starting switch when rotary *is coasting with field switch closed.*

Don't close a.c. starting switch slowly.

Don't close any switch slowly.

Don't close machine circuit breaker with machine switch closed.

Don't close feeder breaker with feeder switch closed.

Don't open d.c. machine switch before opening d.c. machine breaker.

Don't open d.c. feeder switch before opening feeder breaker.

Don't close d.c. machine breaker after heavy short-circuit without first plugging voltmeter to converter to see that polarity is not reversed.

Don't start any but 1200-volt rotaries with field switch in up position.

Don't start 1200-volt rotaries with d.c. brushes down.

Don't throw 1200-volt rotaries on line with d.c. brushes raised.

Don't open or close any high-tension disconnecting switch with anything but disconnecting switch rod, provided especially for that purpose, and never open or close them at all under load or when a.c. oil switches are closed.

Don't touch d.c. commutator or brushes or any current-carrying part of machine or 1200-volt system when machine is running, or get in any position where misstep or accidental move would bring you in contact with live parts of machine.

Don't get within 5 ft. or 6 ft. of any part of high-tension system or in any position where misstep or an accidental move would bring you in contact or even in close proximity to any part of high-tension system.

Things You Should Do and When

When a.c. power goes down, open all starting switches as promptly as possible so that your station will be clear when power comes back on line.

When your a.c. oil switch goes out, open rotary breaker as quickly as possible and shut down in usual manner and start up again.

When d.c. breaker comes out, open knife switch on same panel which is in series with breaker, then close breaker; plug voltmeter to rotary or bus to get rotary voltage, then to line to compare line voltage with rotary voltage. If there is not too great a difference, close knife switch quickly. If line voltage is too low and you have reason to think a train is pulling near your station, wait until the motorman shuts off his power (which will be indicated by line voltage rising) before closing knife switch. If breaker comes out again instantly with heavy flash, try and ascertain cause before cutting on to line again and if caused by trolley wire being down on rail, wait until trouble is cleared up before cutting in feeder or feeders that are grounded. If but one feeder is grounded, open feeder breaker and switch on the one that is grounded and leave the ones that are not grounded, so as to operate as much of line as possible.

When any station switch has been ordered out by any authorized person, it will be opened and red card will be hung on operating lever or handle of switch and record will be made on substation log book stating for what purpose switch was opened and by whose orders. After any station switch has been opened and red card hung on it, it will not be closed again except by person who ordered or caused such switch to be opened or by orders issued by person who ordered or caused such switch to be opened. When any one has opened or caused any station or line switch to be opened, he will not close or cause it to be closed again until all whom he has ordered, instructed or allowed to work on line or circuit controlled by that switch have personally reported themselves clear.

When you have trouble of any kind with the equipment in your station, which you cannot prevent by proper care, promptly report same to substation foreman, and if not taken care of, report same to office of electrical superintendent.

How Many Points of Heat?

At the corner of Fifteenth and Arapahoe Streets, in the center of Denver's business district, the Denver Tramway Company has suspended a two-aspect home-made signal which has red over green bull's-eyes, and is visible from all four directions. This was installed for the purpose of informing the trainmen how many points of heat should be carried in the cars. The signal is controlled from the dispatchers' office and is clearly visible for many blocks in any direction from this corner. All car lines in the city pass within one, two or three blocks of this corner, so that the one signal serves for all lines. It is equipped with two 46-watt lamps. When only the red light is showing this indicates one point of heat; only the green light, two points of heat, and with both red and green lights showing, three points of heat.

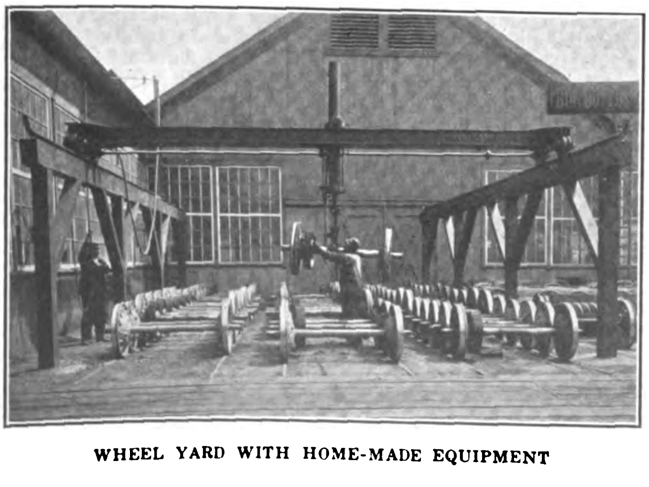
HEAT CONTROL SIGNAL INSTALLED IN HEART OF DENVER

Previously, a cluster of lights at two locations was used for this purpose, but the dispatcher could indicate only when one point of heat should be on. If more than this was necessary, he was compelled to tell each of the car crews as they reported at the ends of the lines, every car being individually dispatched on the Denver system. The new scheme displaced seventy 60-cp. lamps, which were used in the older signals, and substituted the two 46-watt lamps, and at the same time simplified the work of the dispatchers and gave them supervision of the heating current consumption.

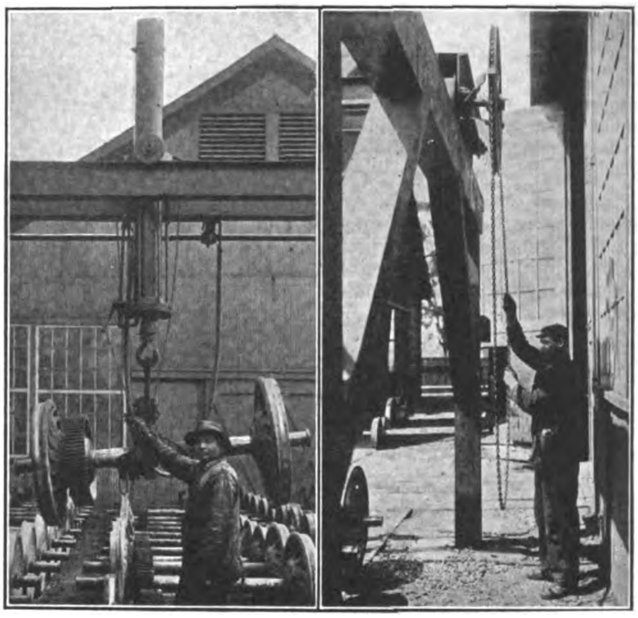
Home-Made 4000-Lb. Air Hoist for the Wheel Yard

To increase the storage capacity of its wheel yard and to save time in placing or removing wheels, George St. Pierre, superintendent of equipment San Francisco-Oakland Terminal Railways, devised the hoistway shown in the accompanying illustrations.

The wheel storage, which is three tracks wide and about eighteen wheel sets deep, is flanked by beam trestles which carry a 70-lb. rail for the hoist carriage. This carriage is mounted on four 12-in. double-flange wheels, one of which is connected to a 36-in. power transmission wheel. The hand operation of this wheel by a chain causes the easy movement of the carriage. The home-made air hoist has a 6-in. piston and a lifting capacity of 4000 lb. A man can easily handle a wheel set in a minute or two with this device.



WHEEL YARD WITH HOME-MADE EQUIPMENT



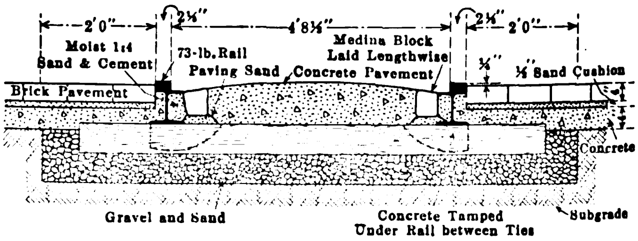
NEAR VIEW OF 4000-LB. HOIST AND TRANSMISSION WHEEL

Concrete Paving Laid Where Use of Costly Material Was Not Justified

BY D. P. FALCONER
Engineer Maintenance of Way, New York State Railways, Rochester, N. Y.

The New York State Railways, Rochester, N. Y., has in several instances had to install paving along tracks, the rails of which were not good enough to warrant the use of expensive paving but which were too good to be torn up and scrapped.

In these cases a concrete pavement was installed to solve the problem of providing a cheap material which would last throughout the remaining life of the rail. In some cases, usually on interurban lines, the track construction consisted of creosoted ties laid on a sand and gravel ballast as shown in the accompanying cross-section. Only such ties were renewed as would not last the estimated remaining life. The concrete was laid over this construction and tamped under the rail between the ties as indicated on the drawing.



CROSS-SECTION OF TRACK CONSTRUCTION, ILLUSTRATING USE OF CONCRETE PAVEMENT

The first of this pavement was put down in 1915 at a location where it is subjected to heavy teaming and it has worn well, in fact, without any repairs to date.

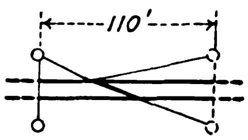
Cost of Erecting Overhead Work—X

(From the records of a large Eastern company)

The following is the tenth group of a series of diagrams with figures to show the actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. The preceding groups of this series were published in the issues for Jan. 20, page 127; Jan. 27, page 173; Feb. 10, page 260; Feb. 24, page 355; March 10, page 447; March 31, page 606; April 14, page 702; May 12, page 880, and May 26, page 969. The remaining group, which is the last of this series, will appear in a later issue.

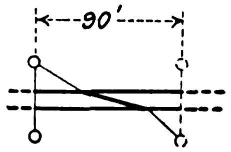
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Right hand crossover



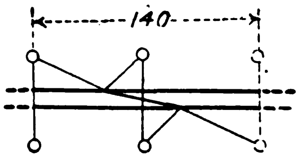
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
70	$9.57	$3.96	$12.76	$5.28	$15.95	$6.60

Right hand crossover



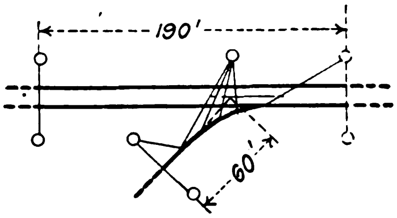
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
71	$9.57	$3.96	$12.76	$5.28	$15.95	$6.60

Right hand crossover



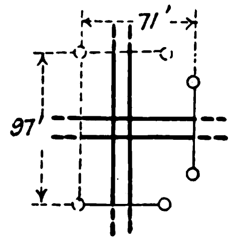
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
72	$12.76	$5.28	$15.95	$6.60	$19.14	$7.92

Single track left hand branch-off, angle 45 deg.



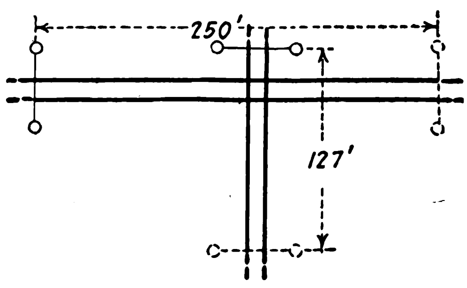
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
73	$15.95	$6.60	$19.14	$7.92	$22.33	$9.24

Double track crossing double track, angle 90 deg.



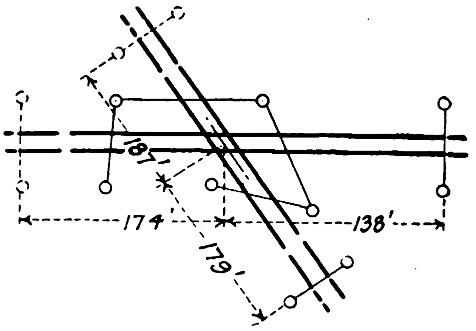
No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
74	$15.95	$6.60	$19.14	$7.92	$22.33	$9.24

Double track crossing double track, angle 90 deg.



No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
75*	$18.15	$13.20	$21.78	$15.84	$25.41	$18.48

Double track crossing double track angle 45 deg.



No.	Light		Ordinary		Congested	
	Labor	Trucking	Labor	Trucking	Labor	Trucking
76*	$27.23	$19.80	$32.67	$23.76	$36.30	$26.40

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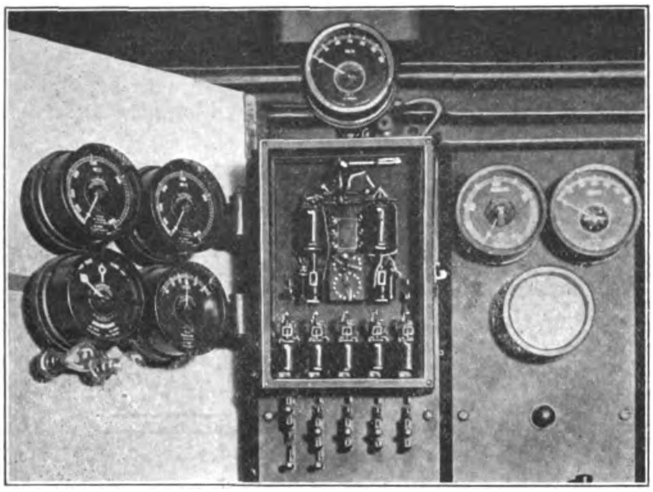
*Trucking includes cost of extra reel truck. None of the figures on this page includes cost of superintendence and engineering.

Black-Dial and White-Dial Meters

In order to bring out clearly the difference between the appearance on the switchboard of black-dial and white-dial meters, the accompanying illustration was recently made by the Westinghouse Electric & Manufacturing Company. The white-dial meter is in the lower right-hand corner. The principle involved in the black-dial meter is scientifically correct, inasmuch as with the black dial only those parts that are to be observed are illuminated, while with the white dial the parts to be read are obscured and the other parts illuminated. The black-dial meters which were originally brought out for use in cab service on electric locomotives are now popular as switchboard instruments.



VIEW OF SWITCHBOARD SHOWING CONTRAST BETWEEN BLACK-DIAL AND WHITE-DIAL METERS

Convenient Method for Furnishing Light to Repair Gangs

An efficient means for furnishing light, where repair or construction work is in progress at night, is afforded by the so-called "Golden Glow" projectors furnished by the Electric Service Supplies Company, Philadelphia, Pa. They are furnished in different types with various control mechanisms, so that they may be installed on the roof of the cab of a car, with the control shaft extending through the roof to a point in close proximity to the motorman or conductor. Fig. 1 shows one of these projectors attached to the cab of a flat open car.

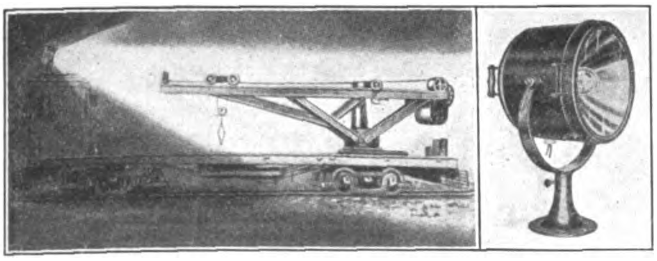
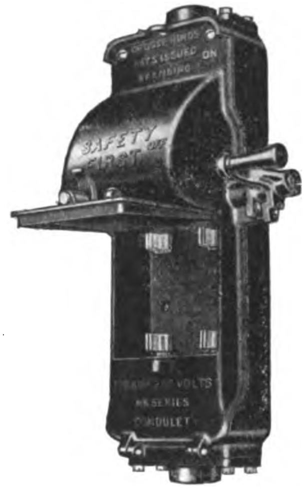


FIG. 1—FURNISHING LIGHT FOR CRANE CAR. FIG. 2—CLOSE VIEW OF PROJECTOR

The light projected is of a greenish-yellow color and has been found particularly desirable for floodlighting due to its non-blinding qualities and, therefore, permits the workmen to observe more detail than would be possible under the conditions that the ordinary white light imposes. These projectors—see Fig. 2—consist of standard cylindrical lamp bodies fitted with handles and supported on heavy malleable-iron forks and cast-iron bases. They are equipped with a standard focusing device which permits the light being directed in a straight concentrated beam or dispersed to cover a large area. Either 9-in. or 12-in. reflectors may be used.

A Condulet Designed for Safety First

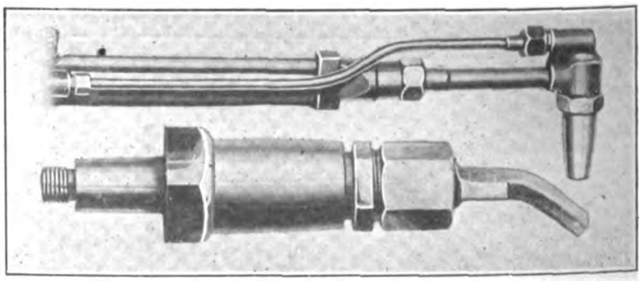
A condulet switch built along safety-first ideas has just been put on the market by the Crouse-Hinds Company, Syracuse, N. Y. It consists of a fused knife switch, inclosed in a cast-iron body which has a hinged cover. A door in the cover which opens into the fuse compartment is so designed that it cannot be opened when the blades are in the "on" position, and in this way provides absolute protection to the person removing the fuses. The switch is operated by a handle outside the case and provision is made for locking it in either the "on" or "off" position by use of a padlock.



SAFETY-FIRST CONDULET SWITCH

New Rivet-Cutting Torch Attachment

To meet the need for a cutting tip especially adapted to cutting off rivet heads and staybolts the Prest-O-Lite Company, Inc., Indianapolis, Ind., has developed the tip shown in the lower of the accompanying illustrations. In order to make a good job in cutting off rivet heads and staybolts flush with plates, by the oxy-acetylene processes, it is desirable to have a cutting tip designed to permit the gas jet to play parallel with the plates. This can be done with the attachment shown because the copper tip is bent at a convenient angle and is adjustable to any position, facilitating operation in close quarters. The attachment is used in connection with the standard blowpipe made by this company, being screwed into the head in place of the regular cutting nozzle.



HEAD OF OXY-ACETYLENE BLOW PIPE WITH REGULAR CUTTING NOZZLE—SPECIAL ATTACHMENT FOR RIVET CUTTING REPRESENTED ON ENLARGED SCALE

News of Electric Railways

Traffic and Transportation
Financial and Corporate
Personal Mention
Construction News

Outcome in Philadelphia Uncertain

Conferences Discontinued—Bills Before the Senate Committee in the Interest of the City Reported Out—New Lease Proposal Suggested

Another conference was held on June 6 between representatives of the city of Philadelphia, Pa., and officials of the Philadelphia Rapid Transit Company. No agreement was reached on the enabling transit legislation which is pending at Harrisburg. The session lasted four hours. At its conclusion Joseph P. Gaffney, chairman of the finance committee of Councils, said that a report would be made to the Mayor on the following day.

On the following day, June 7, the joint councilmanic committee on finance and street railways reported the proposed lease negatively. The committee also reported negatively the bill submitted to Councils on Oct. 10, 1916, embodying the terms of the co-operative agreement of 1914 between the city and the company as revised by Transit Director Twining. An ordinance was then introduced and reported with a favorable recommendation, authorizing Transit Director Twining to prepare and present to the transit company for its acceptance or rejection a lease "fair alike to the city and the transit company for the operation of the city's high-speed lines." This ordinance will be called up on June 21. At once speculation began as to the terms of the new lease. It was said that the lease will be so drafted that should it be rejected by the Philadelphia Rapid Transit Company it can immediately be submitted to an independent operator without change.

Meanwhile there was much discussion of the probable final disposition of the bills before the Legislature. The company continued to oppose them for the reasons reviewed in the ELECTRIC RAILWAY JOURNAL of June 2, page 1019.

LEGISLATIVE MEASURES REPORTED FAVORABLY

On June 12 the measures were reported favorably by the judiciary general committee of the Senate. This action was on motion of Senator McNichol, who some time previously had insisted on further conference between the city and the company in an effort to reach an understanding. The committee voted on the bills following a public hearing. At this hearing Mayor Smith, Mr. Gaffney, Mr. Twining and Dr. William Draper Lewis, special legal adviser, appeared for the city. They contended that the city was at the mercy of the company; that nothing but injustice to the people could result from the failure of the Legislature to pass the bills, and that a square deal to both the people and the company was assured by the proposed legislation. The provisions of the four bills have been reviewed previously in the ELECTRIC RAILWAY JOURNAL. The Salus bill would give the Public Service Commission the right to fix and regulate joint service between the city's system and the lines of the Philadelphia Rapid Transit Company. The Gans bill embodies simply the through routing feature of the Salus bill. The Hecht eminent domain bill would permit the city to take over existing lines by the exercise of the power of eminent domain, if they were necessary as constituent parts of the city's system. The price for the properties thus taken would have to be approved by the Public Service Commission or, if no agreement could be reached, then by the courts. The Hecht constitutional amendment would make it possible for the city to exceed the 10 per cent borrowing limitation if the proceeds were to be used in the construction, purchasing or condemnation of any public utility.

On the convening of the Senate on June 13 Senators Daix and Jenkins reported the bills to that body. They will come up on first reading on June 18 and will reach the final passage stage in the Senate on June 20.

Dallas Deal Arrangements

Messrs. Hobson and Strickland Arranging to Take Over Railway and Lighting Properties in Accordance with Previous Plans

With the settlement of all suits involving the legality of the elections at which the so-called service-at-cost electric lighting and traction franchises of the city of Dallas, Tex., were adopted, the way is cleared for C. W. Hobson and J. F. Strickland to take over these properties under the terms of the consolidation agreement between the traction and lighting interests and the city government.

The franchises as adopted at the recent city election gave Messrs. Hobson and Strickland ninety days in which to complete details for taking over these properties. The time limit will expire soon, but the work of drawing up papers and making final arrangements for a transfer of the railway properties to the company that is to be organized by Mr. Hobson is under way. Two Dallas companies will be organized to take over the properties, one by Mr. Hobson to take over the traction lines and the other by Mr. Strickland to take over the electric lighting properties. Mr. Hobson has a guarantee from Stone & Webster that all outstanding securities of the old companies will be delivered.

Most important to the city of Dallas, in connection with the reorganization of the traction and lighting companies, is the agreement to spend large amounts in extensions, betterments and improvements within stipulated time. Proposed extensions and betterments, including two new interurban lines, each at least 30 miles in length, are already well in their formative state. Some have even been agreed on and orders for their completion passed by the City Commission of Dallas.

Messrs. Hobson and Strickland executed bonds aggregating $1,000,000 to the city of Dallas to guarantee fulfillment of their part of the contract. Under the new company, all street railway lines in Dallas, including the Oak Cliff lines now under the direct control of and being operated by the Northern Texas Traction Company, a Stone & Webster property, will be consolidated and operated as one company.

Montreal Men Get Increase

A copy of a letter written by J. E. Hutcheson, general manager of the Montreal (Que.) Tramways, to A. Gaboury, superintendent of the company, has been posted in the carhouses, informing the men that the management had decided to accord them a general increase of 2 cents an hour on the former scale of wages. This means that after July 1, when the new scale goes into effect, conductors and motormen will receive for the first two years of their service with the company 25 cents instead of 23 cents an hour, for the next two years 26 cents instead of 24 cents, and after five years of service 29 cents instead of 27 cents an hour.

Mr. Gaboury, in making this letter known to the men, remarked that the increase was entirely unsolicited and that the company had made it in spite of the fact that all the costs of operating have been greatly increased since the war began.

Mr. Hutcheson, in the course of his letter to Mr. Gaboury, expressed the appreciation of the management of the loyal service by the conductors and motormen since the war began, when the high cost of everything made operating conditions very difficult, and said the officers were confident that the faithful co-operation given in the past for economical, safe and efficient service will continue in the future.

The men will still pay half the cost of their uniforms in the first three years of service as hitherto, but after that they will receive their uniforms free from the company.

Washington Inquiry Nearing End

The end of the inquiry by the Senate committee into the recent strike of the employees of the Washington Railway & Electric Company, Washington, D. C., would seem to be in sight. At the close of the session on June 11 counsel for both sides indicated that all testimony would be completed by June 12 and that argument would then be begun.

A recent witness before the committee was Edward McMorrow, a member of the general executive board of the Amalgamated Association. On questioning by George P. Hoover, counsel for the company, Mr. McMorrow denied that the union was insincere in suggesting that President Wilson act as an arbitrator or that the union in suggesting Mr. Wilson tried to put President King of the company before the public as defying the President of the United States.

Mr. Hoover took up the long list of Amalgamated strikes within the last two years and asked Mr. McMorrow if this or that strike had not been called because the company in question refused to recognize the union. He denied that this had been so in any of the cases mentioned. Mr. McMorrow explained that the Amalgamated Association did not insist upon the closed shop because it could not furnish members to the companies operating roads whenever they needed men. In this the Amalgamated differed from the ordinary trade union. In the printing trades, for instance, the unions guarantee a supply of labor, and if a union shop desires to increase its force and men are not readily obtainable it must seek union aid in filling any gaps in its organization, union shops even going to the extent of loaning men to other similar concerns.

West Side Bills Signed

Governor Whitman of New York has signed the "West Side" bills. One of them, the Green bill, is for another investigation of the whole question of the relations of the city of New York to the New York Central Railroad, in the matter of this public improvement, and for recommendations of a sound policy. The policy of investigation is also laid down in the other bill, the Ottinger bill, which the Governor has approved. It was supposed that if the Governor signed the latter he would veto the former. The Ottinger bill is virtually a measure drafted by the Public Service Commission. To that commission it gives a degree of joint jurisdiction with the Board of Estimate; it leaves open the door for a voluntary agreement between the railroad and the city until Dec. 1, 1917; after that date, and in default of an agreement, the company is to be compelled to remove its tracks and change its grades. The end sought to be achieved in the so-called West Side improvement is the removal of the tracks of the New York Central Railroad from the surface marginal way along the west side of the city close to the Hudson to an elevated structure or subway and their electrification during this work of improvement. The Mayor and the company have expressed the opinion that the new legislation at this time will tend to set back the electrification.

Tunnel-Bridge Commission Appointed

New Jersey has removed the legal restrictions which militated against that State taking up actively the matter of the projected New York-New Jersey tunnel, and Governor Edge on June 8 named a commission to confer with a similar commission from New York. On the New Jersey commission are former Governor Franklin Murphy, Thomas W. Lamont, T. A. Adams, Morris Rachlin, Theodore Boettger, William H. Noyes, A. H. Allen, Palmer Campbell, J. H. Wells and Thomas N. McCarter, president of the Public Service Corporation of New Jersey, as member at large. The members of the New York commission are George R. Dyer, E. W. Bloomingdale, McDougall Hawkes, Alexander J. Shamberg and Bridge Commissioner F. J. H. Kracke. Mr. Noyes was made chairman of the New Jersey Commission on June 13.

The commission is known as the Hudson River Bridge & Tunnel Commission. The question of bridges will be considered, but it is thought that both the New Jersey commission and the New York body will favor tunnels. The plan is to have tunnels accommodate vehicles and foot passengers. The proposal to have tracks in the roadways over which passenger cars may go will also be considered. It is understood that the commissions will report to the Legislatures of the two States at their next sessions.

As noted in the ELECTRIC RAILWAY JOURNAL of April 14, page 705, the Public Service Corporation of New Jersey recently spent $75,000 in an independent survey of its own to determine, as near as might be in advance, whether the construction and operation of a vehicular tunnel would be commercially practicable.

Pacific Electric Railway Problems

C. H. Burnett, resort and real estate manager of the Pacific Electric Railway, Los Angeles, Cal., addressed the Chamber of Commerce of Venice recently. His subject was "Electric Railway Problems." While his remarks dealt directly with the Pacific Electric Railway, much that Mr. Burnett said applies to many of the other electric railways in California and to not a few properties elsewhere in the country. In discussing the magnitude and extent of the system with which he is associated the speaker said:

"The Pacific Electric Railway operates more interurban cars than are operated in the States of Ohio, Michigan and Indiana combined; runs more trains to Pasadena alone than are operated out of the great trolley center of Indianapolis on all interurban lines in all directions; and the daily interurban train departures from Los Angeles, a city of about 600,000 inhabitants, are greater than the combined train departures from nine important trolley centers of the Middle West, including the cities of Toledo, Detroit, Cleveland, Indianapolis, Dayton, Fort Wayne, Columbus, Springfield and Chicago, with a total population of more than 5,000,000."

SERIOUS FINANCIAL SITUATION

Mr. Burnett next took up the question of finances. In this connection he said:

"If any of you will examine the sworn statements of the electric railways of California on file in the office of the Railroad Commission, you will find that the electric railways of this State are facing a most serious situation, and the Pacific Electric Railway is no exception to this rule. Although our company has invested many millions of dollars in the development of southern California, we have never paid a dividend, and for the last four years our earnings have not even been sufficient to pay interest on the investment, meaning interest on the money actually put into the property and properly chargeable to capital account under the Interstate Commerce Commission classification. The year 1912 was the last year in which our net earnings equalled our interest and fixed charges. For the year 1913 there was a deficit of $364,000 and during each succeeding year this deficit has grown steadily greater until for the single year 1916 it amounted to $982,000, and for the first three months of 1917 it has already equalled $432,000 or at the rate of nearly $1,750,000 for this year."

The causes that Mr. Burnett ascribed for this remarkable condition were the fifty-four different varieties of franchises of the company, many with requirements that have become unnecessary, unjust and exceedingly burdensome, unjust paving charges, unnecessary stops, high cost of material and supplies, radical changes in both freight and passenger motor vehicles and unjust taxation. He cited some of these iniquities in detail. In conclusion Mr. Burnett said:

"I have ventured to point out to you the difficulties under which the electric railways are laboring, in the hope that you will aid us, as opportunity offers, in securing a square deal, and when I say a square deal I mean not only a square deal for the Pacific Electric Railway and its 5000 employees and a square deal for the other electric lines and their thousands of employees throughout the State, but also a square deal for the public and especially for southern California, whose future is so intimately connected with the prosperity of the electric railways, just as its past has been so closely interwoven with their activities and development. Although we are keenly alive to the seriousness of these problems, we are facing them hopefully, optimistically, and with a firm confidence in the ultimate fairness and justness of the thinking public, in whose hands we cheerfully leave our case. Whatever the verdict may be, we will try to meet it with a smile."

Cyclone Hits Michigan Line

The Detroit, Jackson & Chicago Railway, operated by the Detroit (Mich.) United Lines, between Detroit, Jackson and Kalamazoo, was hard hit by a cyclone which swept through a path 2½ miles in width between Ann Arbor and Chelsea on June 6. Poles were snapped in two and much overhead ruined. The tracks were covered with telephone, telegraph and trolley poles, as well as wreckage from fences, barns and houses. Service was completely blocked between Ann Arbor and Chelsea for twenty-three hours. Heroic work was done by the big gangs of laborers, linemen and other employees of the power, track and operating departments. These men worked without rest for twenty-four hours cleaning up the wreckage, digging post holes, putting up new poles, stringing new wire, etc. Gasoline hand cars were used to carry poles and distribute them along the tracks. Sandwiches, coffee, hard-boiled eggs, etc., were distributed by auto to the workers along a stretch of track 2½ miles in length. Every man stuck to the job until the line was reopened for regular service.

Toledo Times Returns to Attack

The proposed plan of municipal ownership of the street railway in Toledo, Ohio, has been condemned editorially by the Toledo *Times*, which says that it would be unfortunate to engage in such an enterprise at the present time. Successful investors do not buy when prices are at top notch, but when prices are right. The paper states that should the city buy the property the coming fall at the market, pledging the credit of the municipality to complete the deal, as now proposed, it will condemn the patrons of the road to a high rate of fare for all time. The rate of fare must be based on fixed charges and cost of operation. Interest on the bonds will necessarily be heavy, since the high prices of all materials will of themselves mean a high price for the property. The *Times* said further:

"No man of sound mind will claim that a politically managed property can be conducted as economically as a privately controlled property. With both fixed charges and operating expenses heavily increased, the car riders would have as much show for low fares as the people of Toledo had for 'free gas' when they embarked on the lamentable enterprise of the city pipe line. Present conditions are bad enough, but that is no reason why they should be made worse. The people elected Milroy as Mayor. Milroy named the 'car commission' and the 'commission' has put us in a hole. But we won't help matters by digging the hole deeper. The problem is to get out and stay out."

Oakland Resettlement Franchise

The advisory committees of seven members each appointed by Mayor Davie of Oakland and Mayor Irving of Berkeley, together with the five newly-elected members of the Alameda Council, headed by Mayor Greene Majors, and also City Attorneys Morf and Stringham, conferred with representatives of the San Francisco-Oakland Terminal Railways, Oakland, Cal., at Mayor Davie's office, on May 14 and 21. Mayor Davie was also present.

Upon request of the advisory committees, the company submitted a skeleton form of resettlement franchise. This suggested form was the subject of discussion at the meetings. The discussions have been on broad lines and so far have been confined in a general way to the main features of the proposed resettlement franchise; to wit, certain legal questions, depreciation and the powers of the proposed boards of control, which boards are to consist of two members—one representing each of the cities interested and the other the railway company. It is proposed to hold regular meetings every Monday evening, and each and every detail will be carefully worked out so as to harmonize all legal, financial or operative problems.

In commenting on the conferences *Key System News*, published by the company, said:

"It seemed to be the opinion of all committeemen present at these meetings that if sufficient time is given to a careful study of the situation the result would be the drafting of a resettlement franchise that would be fair to the public, fair to the railway company, and that would insure the proper city transportation facilities through the rehabilitation of the street railway company's property and equipment."

Governor Stephens has signed Senate bill 534, commonly known as the resettlement franchise bill. This bill was introduced into the Legislature and passed unanimously, and was intended to smooth out some possible legal obstacles.

Estimates of Extensions Under Way

The City Council of Seattle, Wash., has passed a resolution introduced by Councilman Oliver T. Erickson, calling upon the city engineer to obtain estimates on the cost of extending and connecting the municipal lines. The vote was unanimous, but Councilman Hanna qualified his vote by the statement that his support of the resolution was not to be interpreted to mean that he would vote for an ordinance authorizing the extensions. He stated that he desired to obtain figures showing what would be the possible income to the city from the enlarged street railway system.

The city utilities department is now preparing figures of cost. The city engineer will furnish estimates of the cost of a double-track steel elevated railway with rails and single trolley on Washington Street, running from Fourth Avenue South and Washington Street to the terminus of the Port Belt line at Washington Street and Railroad Avenue; and of a double-track steel trestle with rails and single trolley to be built from Railroad Avenue and Washington Street south to Spokane Street over the Port Belt line, as near as practicable, then west to connect with the new Spokane bridge and the Lake Burien municipal car line. The resolution originally called for a wooden trestle on Washington Street, but when it was pointed out that steel must be used at this point, unless the building code enacted by the Council is to be violated by the city, the resolution was changed calling for estimate on steel construction.

A resolution was also adopted directing the Board of Public Works to build a double-track car line and trolleys on the proposed higher level bridge across the West Waterway at West Spokane Street.

Renewal of Negotiations Likely

St. Louis Conferences on Mill Tax and Other Matters Will Probably Be Resumed Soon

It was stated recently by Mayor Kiel of St. Louis, Mo., that on June 15 he would send a special message to the Board of Aldermen, asking the members to appoint a committee of three who with the Mayor and City Counselor shall be authorized to take up the existing controversy with the United Railways over the mill tax. The Mayor explained that the committee of public utilities of the board, which is composed of seven members and to which had been assigned the disposal of the mill tax controversy, was too unwieldy. He thought that a smaller body could handle the work more expeditiously. Owing to the fact that legislative action will be required to effect the settlement it will be necessary to have an aldermanic committee in the conference. The addition of the City Counselor to the committee is to have him take care of the legal phases of the compromise if one is reached.

On Nov. 22, 1916, the United Railways made substantially the following proposal to the city: The company would agree to accept liability for the mill tax up to Dec. 31, 1916, the amount to be paid in equitable annual installments, provided that the city would agree to substitute a new tax bill based on the operating conditions of the company at present, agree to withdraw its attack on the validity of the underlying franchises of the company and extend all the present franchises to April 12, 1948.

An informal proposal has also been made by the company to permit the city to have an interest in the company somewhat after the method in use in Chicago.

Murray Carleton, A. L. Shapleigh and Richard McCulloch were some time ago designated by the directors to represent the company in the negotiations with the city.

Denver Brotherhood Pledges Loyalty

Certain of the men in the employ of the Denver (Col.) Tramway who, as a committee of the employees, presented an agreement to the management on June 4 making demands for higher wages and a ten-hour work day later repudiated the action after they had discussed the situation with F. W. Hild, general manager of the company. The statement of the members of the committee whose names were on the demands was as follows:

"We, the undersigned committee, appointed to represent the Amalgamated Association of Street & Electric Railway Employees, find that matters are not as represented and hereby advise our fellow workmen and trainmen not to attend any meetings called for the purpose of organization, but we do believe that all these matters can best be handled through our own brotherhood. We have resigned from the committee."

The brotherhood of employees of the company, organized some time ago, will appoint a committee which will take up the matter of wages with the management. This is in accordance with a plan formerly decided upon, to which program the members of the union committee previously mentioned is now committed. On June 5 nearly 500 members of the brotherhood passed a resolution repudiating the action of the committee of five. This resolution, except for the abstract which it contained from Article I of the by-laws of the brotherhood relating to the purposes of the brotherhood, follows in full:

"Whereas, a committee claiming to represent the employees of the Denver Tramway waited upon F. W. Hild, general manager of said company, on June 4 and at said time submitted a set of demands upon the company, signed by said committee, and outsiders having no connection whatever with the company,

"And whereas, the said committee were not authorized to represent the employees of the company or the members of the Tramway Brotherhood:

"Now, therefore, be it resolved by the trustees and members of the Tramway Brotherhood of Denver, all employees of the Denver Tramway, in this meeting assembled, that the aforesaid action of this committee was entirely without warrant or authority.

"Further resolved, that we do hereby reaffirm our allegiance to said brotherhood and particularly the purposes and objects thereof as set forth in Article I of the by-laws.

"Further resolved, that we believe the members of said committee acted under a misapprehension of the facts, and we hereby approve their resignation from said committee.

"Further resolved, that a copy of these resolutions be sent to the Denver Tramway and the press of the city."

On the brotherhood board which will deal with the company are one man from each of the seven divisions and three from the major departments.

Chicago Wage Situation

Friendly negotiations are being continued by the officers of the Chicago Surface Lines, the Chicago Elevated Lines and the representatives of the respective unions looking toward an agreeable settlement of the wage question. William D. Mahon, president of the Amalgamated Association of Street & Electric Railway Employees, is in Chicago to help with the situation. The president of the elevated union is quoted as having said:

"I don't believe there will be any sort of settlement in less than a couple of months' time. There is no strike spirit in the conference which our union has held with Mr. Budd. Mr. Budd has always been courteous and open-minded."

Chicago Bills Before House Committee

Walter L. Fisher, special counsel for the local transportation committee of Chicago, was cross-examined on the Chicago traction situation during the principal part of a three-hour session of the House committee on public utilities of the Illinois State Legislature on June 12. Action of the committee was postponed until the following night. The principal questions directed at Mr. Fisher concerned the connection of Samuel Insull with the bills. Mr. Fisher said that in his judgment Mr. Insull's attitude was that of willingness to go along as a factor in the general adjustment of the traction situation, and that he did not care whether the bills were passed. Mr. Fisher expressed the opinion that in case the bills were passed and ordinances were adopted by referendum vote the solution of the situation would be a purchase of the elevated lines by the surface lines. Under such an arrangement Mr. Insull would be able to protect his existing power contract with the lines.

Hazleton Line Increases Wages.—The conductors and motormen on the Wilkes-Barre & Hazleton Railway, Hazleton, Pa., have received a voluntary wage increase of 1 cent an hour for a nine-hour day.

Jurisdiction of Public Service Commissions Extended.—Governor Whitman of New York has signed the Machold bill giving the Public Service Commissions jurisdiction over navigation companies, transportation companies and common carriers by water.

B. R. T. Gets Court Order in Car Case.—The Brooklyn (N. Y.) Rapid Transit Company has obtained from the courts a writ of certiorari for the review of an order issued to it last December by the Public Service Commission for the First District of New York to buy 250 extra cars for use on the surface lines of Brooklyn.

New Kentucky Board.—A new law has been enacted in Kentucky creating a Board of Tax Commissioners. The members of this commission have not yet been appointed, but when the appointments have been designated the members will organize and then take over the work performed by the former Board of Assessment and Valuation.

Progress of East St. Louis Arbitration.—C. E. Smith, representing the East St. Louis & Suburban Railway, East St. Louis, Ill., on the arbitration committee, and Al Towers, who is looking after the interests of the employees on the committee, are holding daily conferences. Thus far they have not progressed to that point where a third arbitrator can be called in. Just as soon as the two representatives have arrived at the point where a third party will be of assistance in settling the matters before them one will be named.

Governor Signs Car Capacity Bill.—The Governor of New York has signed the bill under which the Public Service Commissions receive power to fix the maximum number of passengers that may be carried on a street car in any city of more than 450,000 population. The lodgment of this specific authority solely with the commissions is the outcome of the attempt made by the Board of Health of New York City, under the wide power which it enjoys, to impose car-carrying capacity rules upon certain car lines in Greater New York.

Recruiting in New York.—Alexander J. Hemphill of New York City's committee on national defense has asked for 2000 volunteers among those who have worn their country's uniform to stimulate recruiting for all branches of the service. The men will be organized in squads of five to twenty men to address and give out information to audiences throughout the city. Volunteers are requested to send their addresses to the secretary with an offer of service of one night each week in the recruiting battalion, whose headquarters are at 50 East Forty-second Street, New York.

Extension Order Upheld by Supreme Court.—The Supreme Court of the United States on June 11 upheld the order of the Public Service Commission of Washington requiring the Puget Sound Traction, Light & Power Company to improve the street railway service on several lines in the city of Seattle. The company appealed on the ground that two of the lines involved, which run over tidal marshes to the beaches, were unprofitable. The majority of the Supreme Court held this not to affect the question, so long as the entire system was profitable. Justices White, McKenna and McReynolds dissented.

I. C. C. Rate Hearings Ended.—Hearings on the application of the railroads of the country for a 15 per cent horizontal raise in freight rates were closed on June 12 by the Interstate Commerce Commission. The carriers have rested their case on the statement that increased labor costs, due to the Adamson law, and higher costs of materials, fuel and supplies, have created an emergency. Shippers have submitted data designed to show that the earnings of the roads are on an increase, and that the year 1917 will be the best in history, except 1916, which was the peak period of railway earnings, and admitted to be abnormal.

Board Establishes Responsibility for Accident.—A board of arbitration sitting for the Pacific Gas & Electric Company and the company's street railway employees at Sacramento, Cal., in a case involving the discharge of a motorman for alleged negligence, has decided that the motorman be reinstated and paid back salary amounting to $1,107. Lafayette Derr, the motorman, was discharged a year ago last May after a collision between his car and a buggy. His fellow employees claimed that he had been discharged after an incomplete investigation. The company, desiring fully to protect the employees from any possible injustice, agreed to arbitrate. The board consisted of Judge John C. March, representing the employees, J. L. Nagle, representing the company, and T. D. Littleton, selected by Messrs. March and Nagle.

Franchise Tax Illegal.—The Louisville & Interurban Railroad and the Louisville Railway on June 11 won an appeal in the Supreme Court of the United States to prevent the Kentucky Board of Assessments from imposing a franchise tax for the year 1915 at a rate of assessment higher than that imposed on other classes of property in the State. Justices Holmes, Brandeis and Clarke dissented. Bases of assessment for railroad property, which the roads claim to be too high, were involved in the suit. Emphasis was laid in the opinion of the Supreme Court on the fact that the tax assessments on the property of the public service corporations in Kentucky are fixed by the Railroad Commission, while another body assessed all other property for taxation. In the case of the public service corporations property was assessed at 75 per cent of full value. In all other cases the property was assessed at only 52 per cent.

Controversy on San Francisco Crossing Maintenance.—The United Railroads, San Francisco, Cal., has served notice on the contractor installing the tracks on which the Municipal Railway will parallel the private company's Market Street lines that he must have the company's permission to install the several crossings where the Municipal lines cross those of the United Railroads. The private company points out that the California Railroad Commission has ruled that a railway which desires to cross the tracks of another company must put in the crossing and maintain it at its own expense. On this ground the company declares that the Municipal Railway must bear the installation and maintenance cost of the new crossings. The city attorney, on the other hand, takes the stand that the Municipal line, not being subject to control by the Railroad Commission, is not liable for this charge and proposes that the United Railroads assume half the expense of maintaining the crossings.

Washington State Valuations.—According to figures compiled by the State Tax Commission of Washington the valuations of both electric and steam railroads have decreased. Steam roads have a total valuation of $341,132,897 in 1917 compared to $341,917,929 in 1916, while the valuation of the electric roads has decreased from $45,462,600 in 1916 to $44,626,975 in 1917. The lower valuations are attributed to the fact that neither the steam nor the electric roads have added appreciably to their stock and equipment during the last twelve months, while the usual depreciation has taken place. Of the electric roads, the Puget Sound Traction, Light & Power Company valuation remains the same at $18,681,600. On the other hand, the valuation of the Tacoma Railway & Power Company is cut from $3,600,000 to $3,450,000 and that of the Puget Sound Electric Company of King and Pierce Counties from $3,000,000 to $2,800,000. The valuation of the Olympia Light & Power Company remains the same at $330,000.

Program of Association Meeting

New York State Convention Abandoned

The June convention of the New York Electric Railway Association, arranged to be held at Bluff Point, N. Y., on June 26 and 27, will be omitted this year. There will be a business meeting of the association, however, at the Hotel Astor, New York, on June 27 at 10.30 a. m. for the election of officers and the transaction of other important business.

Financial and Corporate

Annual Reports

New Orleans Railway & Light Company

The comparative income statement of the New Orleans Railway & Light Company, New Orleans, La., for the calendar years 1915 and 1916 follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Operating revenue	$7,200,740	100.00	$6,951,587	100.00
*Operating expenses	3,603,859	50.06	3,410,773	49.06
*Net operating revenue	$3,596,881	49.94	$3,540,814	50.94
Revenue deductions — taxes, etc.	781,841	10.84	776,077	11.17
*Net operating income	$2,815,040	39.10	$2,764,737	39.77
Miscellaneous income and outside operations	68,391	0.95	55,243	0.79
*Gross income	$2,883,431	40.05	$2,819,980	40.56
Income deductions—interest, etc.	1,907,196	26.49	1,817,987	26.15
Net income before deducting charges for renewals and replacements	$976,235	13.56	$1,001,993	14.41
Charges for renewals and replacements	255,883	3.55	212,927	3.06
†Net income	$720,352	10.01	$789,066	11.35

*Not including charges for renewals and replacements shown below.

†This amount before distribution, subject to a deduction of $16,666 per month, from June 1, 1916, as an additional reserve for repairs, maintenance, and renewals and replacements.

The gross operating revenue of the company increased $249,153 or 3.58 per cent in 1916 as compared to 1915, while the operating expenses rose $193,086 or 5.66. As a result, the net operating revenue gained $56,067 or 1.58 per cent. After higher payments for taxes and interest and larger charges for renewals and replacements, the net income showed a falling off of $68,713 or 8.71 per cent.

The decrease in net income was mainly caused by the reduction in electric rates, which became effective on Dec. 1, 1915, and the increased cost of materials and wages. On May 29, 1916, a jitney ordinance became effective, as a result of which the jitneys practically ceased to operate and the railway earnings increased. The large share of the railway department in the gain in net operating revenue is shown below:

	1916	1915	Increase	Per Cent
Operating revenue:				
Railway department	$4,422,777	$4,198,235	$224,542	5.35
Electric department	1,433,814	1,489,015	*55,200	*3.70
Gas department	1,344,149	1,264,337	79,811	6.32
Total	$7,200,740	$6,951,587	$249,153	3.58
Operating expenses:				
Railway department	$2,437,364	$2,342,411	$94,953	4.05
Electric department	635,359	573,406	61,952	10.70
Gas department	531,136	494,956	36,181	7.32
Total	$3,603,859	$3,410,773	$193,086	5.66
Net operating revenue	$3,596,881	$3,540,814	$56,067	1.58

*Decrease.

In 1916 the company carried 87,680,288 revenue passengers as compared to 65,021,214 in 1915, with transfer passengers of 25,173,015 and 6,641,193 in the two years respectively. The percentage of passengers using transfers increased from 10.2 per cent in 1915 to 28.7 per cent in 1916, while the average fare per passenger dropped from 4.57 cents to 3.88 cents. The car mileage in 1916 was 19,933,702 and in 1915 it was 16,753,874.

The actual charges for maintenance during the year amounted to $775,598. In addition to this amount, there was expended $354,378 for renewals and replacements, making a total charge for maintenance and renewals and replacements of $1,129,976. There was reserved from income and surplus for renewals and replacements, $372,549, resulting in a net credit to renewal and replacement reserve for the year of $18.171. A total of $726,433 was expended for improvements and betterments during 1916.

Milwaukee Electric Railway & Light Company

The comparative income statement of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., for the years ended Dec. 31, 1915 and 1916, follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Operating revenues—railway	$4,612,397	66.2	$3,911,942	65.6
Operating revenues—light, power and steam heat	2,348,754	33.8	2,059,773	34.4
Total operating revenues	$6,961,151	100.0	$5,971,715	100.0
Railway operating expenses:				
Way and structures	$209,985	3.0	$181,856	3.2
Equipment	200,496	2.9	206,541	3.4
Traffic, power, transportation	1,704,279	24.6	1,461,951	24.5
General	139,251	2.0	139,890	2.3
Undistributed	328,540	4.7	259,491	4.3
Depreciation (reserve credit)	593,091	8.5	465,679	7.8
Contingencies (reserve credit)	1,000	0.0	......	...
Taxes (reserve credit)	289,738	4.1	277,018	4.6
Total railway operating expenses	$3,466,480	49.9	$2,992,426	50.1
Operating expenses—light, power and steam heat	1,464,844	21.0	1,172,455	19.7
Total operating expenses	$4,931,324	70.9	$4,164,881	69.8
Net operating revenue	$2,029,827	29.1	$1,806,834	30.2
Non-operating revenue	77,173	1.1	29,321	0.5
Gross income	$2,107,000	30.2	$1,836,155	30.7
Income deductions	759,393	10.9	793,570	13.3
Net income	$1,347,607	19.3	$1,042,585	17.4
Dividends on preferred stock	$270,000	3.8	$270,000	4.6
Dividends on common stock	1,058,875	15.2	763,375	12.7
Surplus	$18,732	0.3	$9,210	0.1

The operating revenues for 1916 showed an increase of $989,436 or 16.57 per cent as compared to those of the preceding year. The operating expenses, however, rose $766,443 or 18.4 per cent, so that the net operating revenue gained $222,993 or 12.3 per cent. Owing to a large gain in non-operating revenue, and also a substantial decrease in income deductions, the net income for the year showed an increase of $305,022 or 29.2 per cent.

The increase in the operating revenues of the railway department was $700,455 or 17.91 per cent. This gain was partly due to a substantial reduction in jitney operation and partly to the intense industrial activities generally prevailing throughout the country. The increase in operating expenses was $474,054 or 15.8 per cent. The light, power and steam-heat revenues gained $288,980 or 14.03 per cent. For the whole company, the higher cost of materials and labor, and the larger reserve for depreciation and taxes, absorbed 77 per cent of the increase for the year in operating revenues.

The appropriations for maintenance and depreciation included in operating expenses were equivalent to the following percentages of the operating revenues of the respective departments: Electric railway department, 22.25 per cent; electric light and power department, 18 per cent; and steam-heating department, 12 per cent.

During 1916 there was expended for additions and betterments the sum of $1,005,631, of which $506,125 was chargeable to the railway, $439,401 to the electric utility and $60,104 to the heating utility. The value of property replaced or abandoned and charged to the depreciation reserve during the year was $153,971.

The Employees' Mutual Savings, Building & Loan Association continued to show substantial growth. At the end of the year the employees had subscribed to $2,613,300 par value of stock of the association and had borrowed on first-mortgage loans $277,650. The last year showed the largest rate of growth in the history of the association, stock subscriptions having increased $1,331,000 or 104 per cent and mortgage loans $139,350 or 101 per cent.

Miscellaneous statistical data of the company follow:

	1916	1915
Receipts per mile of track operated	$25,594.57	$21,698.05
Revenue passengers carried	107,528,091	91,400,946
Transfer passengers carried	44,655,506	37,868,654
Per cent of transfer to revenue passengers	41.54	41.43
Receipts per revenue passenger	$0.0425	$0.0424
Revenue car-hours operated	1,772,573	1,613,680
Receipts per revenue car-hour	$2.60	$2.42
Revenue car-miles operated	15,889,284	14,323,343
Receipts per revenue car-mile	$0.2901	$0.2731

$23,000,000 Additional Needed

Original Estimate of $22,459,893 for Subway Equipment Material, Made in 1913, Has Expanded to $44,827,327, Due to Rising Costs

An application was filed on June 13 by the Interborough Rapid Transit Company with the Public Service Commission for the First District of New York for authority to issue an additional $25,483,772 of 5 per cent bonds under its first and refunding mortgage of $300,000,000, dated March 20, 1913. The appeal to the commission shows that the total estimated cost of the equipment provided for in the dual system contracts is $44,827,327. The original estimate made in 1913 was $22,459,893. The difference is accounted for by the general statement that it represents the increases in the cost of labor and material, and covers also some additional work that was not contemplated when the preliminary estimates were made.

Of the proposed new issue $23,827,327 is to be used to pay for the cost of equipment and the remaining $1,656,445 is to meet the expenses of the sale of the bonds at the proposed price of 93½, and to take care of any discount or deficiency in the amount realized. The figures show that $6,371,631 had been spent for equipment up to Dec. 31, 1916. Among the large expenditures yet to be made the table shows $1,312,000 for tunnels, $3,371,000 for interlocking and other signal apparatus, $2,301,000 for a transmission system, $5,585,000 for a distribution system, $1,467,000 for stations, waiting rooms and other buildings, $3,870,000 for substation equipment, $7,581,000 for cars, $3,388,000 for electrical equipment of cars, and $3,300,000 for interest during construction.

The commission will hold a public hearing on the application on July 9.

As noted in the ELECTRIC RAILWAY JOURNAL of March 24, page 567, the company some time ago applied to the commission for $16,436,090 additional to provide for the completion of work estimated in January, 1913, to cost $26,953,702. Early in the present month the commission authorized the company to sell $11,436,000 face value of 5 per cent bonds under the application just noted. The commission, however, withheld its approval of $5,000,000 of the total sum for reasons advanced at length in its opinion on the case.

Frisco Reorganization Approved

Capital to Be Reduced from $84,639,100 to $47,011,100 —Total Annual Interest Charges Will Be Cut $343,890

The amended plan of reorganization of the United Railroads, San Francisco, Cal., dated April 26, 1917, has been declared operative, the holders of more than $20,500,000 of the 4 per cent bonds due in 1927 having assented to it. Notice to this effect was given on June 9 by the committee of holders of the 4 per cent bonds, of which John Henry Hammond of Brown Brothers & Company, New York, N. Y., is chairman. Further deposits will be received without penalty at the office of the Equitable Trust Company, New York, N. Y., or the Union Trust Company, San Francisco, Cal., on or before June 24. After that date such bonds as the reorganization committee may accept will be charged $20 a bond.

Two committees sought deposits of the 4 per cent bonds of the company. Later these committees reached a tentative understanding in regard to the reorganization. The proposal is to reduce the capitalization from $84,639,100 to $47,011,100. The amended plan for readjusting the finances of the company provided as follows:

First, for the cash requirement of $5,200,000 to take care of underlying bonds overdue and to mature on April 1, 1918; second, for the exchange of the present 4 per cent bonds for new securities, consisting of 66 2-3 per cent of the holdings in new 6 per cent bonds, 8 1-3 per cent in first preferred stock and 33 per cent in new common stock; third, for the retirement of $45,873,000 in outstanding notes, preferred stock and common stock, by an issue of $12,244,000 of new second preferred and common stock, and, fourth, for salable securities to take care of the company's future capital requirements.

The $5,200,000 cash requirement is provided for as follows: $2,200,000 by the use of income accumulated pending reorganization and the sale of some non-operative property and $3,000,000 by the sale of Market Street Railway 5 per cent bonds. This leaves the Market Street Railway 5 per cent bonds as the only underlying bonds and reduces the total underlying amount to $10,098,000. Under the terms of the Market Street Railway mortgage, $3,909,000 is reserved for future improvements.

For all the junior issues the plan provides $6,000,000 of second preferred stock and $6,244,000 of common stock. In addition, the junior security holders are required to purchase $3,000,000 of Market Street Railway 5 per cent bonds, to be issued to retire underlying bonds at par, for $3,000,000 cash.

The fixed interest on the new 6 per cent bonds is exactly equal to the 4 per cent interest on the par of the present bonds, and the interest return to the bondholders is left unchanged. The total interest bearing debt of the company is reduced by the plan $12,959,000. The total annual obligatory charges are reduced $343,890. The total annual interest charges under the new plan will be $1,444,860.

Sale of Northern Electric Unlikely

As stated previously in the ELECTRIC RAILWAY JOURNAL, the amended plan of reorganization of the Northern Electric Railway, Chico, Cal., has been declared operative. Closely following this announcement the statement was made that representatives of the Western Pacific Railway told the reorganization committee that their company was prepared, if the California Railroad Commission should approve, to enter into negotiations for the purchase of the Northern Electric Railway. According to the San Francisco *Chronicle* these negotiations have been called off, for the present at least. That paper said recently:

"All negotiations between the Western Pacific Railway and the reorganization committee of the Northern Electric Railway for the purchase of the Northern Electric's properties by the Western Pacific are off, at least for the present. It was announced that at a meeting of the reorganization committee the sub-committee appointed to consider the proposition reported that 'after a thorough consideration of the subject, they had concluded that the reorganization committee was not in a position at the present time to accept or reject any offer, nor could it enter into any agreement for the sale of the properties, and they therefore deemed it inadvisable further to negotiate at this time.'

"The committee recommended that the foreclosure proceedings be carried through at once and that the properties be purchased at the foreclosure sale, and that when the reorganization had been completed the negotiations with the officials of the Western Pacific Railway for the sale of the properties be resumed.

"The recommendations of the sub-committee were unanimously approved by all the members of the reorganization committee, and the attorneys were directed to take steps to obtain decrees of foreclosure of the various bond mortgages as soon as possible."

Oklahoma Valuations Fixed

Assessments for taxation purposes have been fixed for many of the street railway and interurban lines in Oklahoma. In most cases the figures are higher than the valuations fixed last year. The Board of Equalization is following a new plan in making assessments this year. It is taking for purposes of taxation the valuations as certified by the various corporations to the Corporation Commission for rate-making purposes. The traction interests have protested against this. They maintain that the actual investment and other values on which rates should be based can not be taken as the real value on which values for taxing purposes should be based. Valuations so far fixed by the State Board of Equalization are as follows: Bartlesville Interurban Railway, $275,000; Guthrie Street Railway, $25,000; Oklahoma Street Railway, Oklahoma City, $3,115,000; Sapulpa Electric Interurban Company, $125,000; Shawnee-Tecumseh Traction Company, $100,000; Tulsa Street Railway, $325,000; Union Traction Company, Tulsa, $225,000; Enid City Railway, $230,000; Ardmore Street Railway, $22,500; Capital Traction Company, Oklahoma City, $8,000; Chickasha Street Railway, $37,500; Pittsburg County Railway, McAlester, $629,061; Fort Smith Light & Traction Company, $30,206; Lawton Railway & Lighting Company, $42,000; Muskogee Electric Traction Company, $385,000.

Returns for Nebraska Lines

The gross earnings from operation of electric railways in Nebraska for the year ended June 30, 1916, totaled $3,931,736, as compared to $3,742,703 in the preceding year. Operating expenses increased from $2,149,140 to $2,345,727. The income from operation before interest and taxes decreased slightly, from $1,664,126 to $1,660,000. The dividend payments fell off from $557,812 to $503,298, and no reservation was made for depreciation as compared to $2,812 in 1915 and $294,605 in 1914. Only $3,399 was expended for additions and betterments in 1916. The number of revenue passengers rose from 67,288,561 to 68,432,670, while the revenue car-miles increased from 13,174,366 to 13,371,074.

Bristol (Tenn.) Traction Company.—Judge McDowell has refused the application to have the Bristol Traction Company wound up in the bankruptcy court, leaving it in the hands of the receivers, Fred D. Dulaney and Joseph A. Caldwell, to be disposed of under the direction of the State courts. Receiver Caldwell is reported to have said: "The property will be sold at an early date for the benefit of the bondholders, as it was found impossible for the company to pay its interest on the bonds. The stock will probably be a total loss. This is one among many of the small traction companies which have been put out of business by the jitneys and the automobile business and it is doubtful if Bristol will have an electric railway much longer."

Central Arkansas Railway & Light Corporation, Hot Springs, Ark.—The Central Arkansas Railway & Light Corporation, by appropriate action by its directors and stockholders, has reduced the authorized capital stock from $10,500,000 to $4,000,000, of which $1,500,000 is preferred and $2,500,000 common. There is now issued and outstanding $1,200,000 of 7 per cent preferred stock and $2,500,000 of common stock. The reduction in authorized capital does not affect the present issues outstanding. The Federal Light & Traction Company owns all the outstanding common stock.

Cincinnati, Dayton & Toledo Traction Company, Hamilton, Ohio.—The properties of the Cincinnati, Dayton & Toledo Traction Company, according to a statement issued by the bondholders' committee, will be sold under foreclosure proceedings at public auction on June 30. The sale will be made subject to the underlying mortgage bonds, of which there are $2,300,000 outstanding. Bidders, therefore, will be required to bid for the equity over and above that amount.

Cincinnati, Milford & Loveland Traction Company, Cincinnati, Ohio.—On application of B. H. Kroger as a judgment creditor, C. C. Harris, president of the company, was appointed receiver of the Cincinnati, Milford & Loveland Traction Company by the Common Pleas Court at Cincinnati on June 7. Mr. Kroger had first secured a confessed judgment for $28,600 on notes for $25,000 and $2,500, both given on Dec. 29, 1914, together with accrued interest. The company operates between Madison and Blanchester. He contended that the road was so encumbered that the rights of creditors and stockholders could only be protected by a receivership. The company's trouble dates from the flood three years ago, when damages amounted to $35,000 or $40,000. Mr. Kroger is reported to hold a considerable amount of the stock of the company.

Cities Service Company, New York, N. Y.—Requests have been made to Henry L. Doherty & Company, fiscal agents of the Cities Service Company, for a reduction in the par value of the stock, the listing of the stock on the New York Stock Exchange and the granting to the stockholders of the first opportunity to supply additional capital. It is understood that all these matters were discussed at a non-official meeting of the board of directors on June 8. While no action was taken on any of them, the questions will come up for consideration at the regular meeting of the board on June 20.

Georgia Railway & Power Company, Atlanta, Ga.—All of the remaining first mortgage 5 per cent gold bonds of the Blue Ridge Electric Company dated July 1, 1910, have been called for payment on July 1 at par and interest at the office of the Columbia Trust Company, New York, N. Y.

Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, Minneapolis, Minn.—The property of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, popularly known as the Dan Patch line, is advertised to be sold at public auction as an entirety on June 28 at Minneapolis under foreclosure of the first mortgage of 1915, pursuant to an order of the United States District Court of the Fourth District of Minnesota.

New York (N. Y.) Railways.—New directors have been elected for the Bleecker Street & Fulton Ferry Railroad, which was taken over recently by the New York Railways. They are: J. H. Campbell, H. M. Fisher, E. F. J. Gaynor, B. J. Pepperman, W. L. Pepperman, D. W. Ross, H. H. Vreeland, Frank Hedley, George Keegan, Charles E. Warren, A. C. Wigren, E. E. Starboard and W. A. Anderson.

Public Utilities Company, Evansville, Ind.—The Public Utilities Company, a subsidiary of the Union Railway, Gas & Electric Company, has filed an open refunding mortgage, securing a present issue of $3,951,000 of bonds. The Bankers' Trust Company, New York, N. Y., is trustee under the mortgage securing the issue.

Utah Securities Corporation, New York, N. Y.—The aggregate gross earnings of the operating subsidiaries of the Utah Securities Corporation increased 16 per cent and the net 21 per cent during the year ended Dec. 31, 1916. The subsidiary Utah Light & Traction Company, which operates the street railway in Salt Lake City and vicinity and leases its lighting properties to another subsidiary, secured an increase of 4 per cent in gross earnings and 9 per cent in net during the last year. The 1916 gross totaled $1,455,081, with operating expenses at $952,909, so that the net earnings amounted to $502,172. Other income totaled $365,212 and deductions $859,740, leaving a balance of $7,644. This compares with a balance of $12,262 in 1915.

Dividends Declared

Brazilian Traction, Light & Power Company, Toronto, Ont., quarterly, 1½ per cent, preferred.

Cleveland (Ohio) Railway, quarterly, 1½ per cent.

Columbus (Ga.) Electric Company, 3 per cent, preferred.

Duluth-Superior Traction Company, Duluth, Minn., quarterly, 1 per cent, preferred.

Eastern Power & Light Corporation, New York, N. Y., quarterly, 1¾ per cent, preferred.

Eastern Texas Electric Company, Beaumont, Tex., 3 per cent, preferred; 2½ per cent, common.

El Paso (Tex.) Electric Company, 3 per cent, preferred; quarterly, 2½ per cent, common.

Illinois Traction Company, Champaign, Ill., quarterly, 1½ per cent, preferred.

Manila Electric Railroad & Lighting Corporation, Manila, P. I., quarterly, 1½ per cent.

Springfield Railway & Light Company, Springfield, Mo., quarterly, 1¾ per cent, preferred.

Toronto (Ont.) Railway, quarterly, 2 per cent.

Twin City Rapid Transit Company, Minneapolis, Minn., quarterly, 1¾ per cent, preferred; quarterly, 1½ per cent, common.

Union Passenger Railway, Philadelphia, Pa., $4.75.

United Light & Railways Company, Grand Rapids, Mich., quarterly, 1½ per cent, preferred; quarterly, 1 per cent, common.

United Traction & Electric Company, Providence, R. I., quarterly, 1¼ per cent.

West End Street Railway, Boston, Mass., $2, preferred.

West Philadelphia (Pa.) Passenger Railway, $5.

Traffic and Transportation

Fare Hearings Begun

Middlesex & Boston's Cry for Relief Results Largely from Competition with Inexpensive Motor Vehicles

"Henry Ford has eaten into the kingdom that was supposed to be reserved for Thomas A. Edison," said A. A. Ballantine, counsel for the Middlesex & Boston Street Railway, Newtonville, Mass., at a hearing on June 11 before the Public Service Commission of Massachusetts upon the company's petition for authority to increase its rates. The company joined the ranks of higher-fare seekers following the decision of a wage arbitration board on May 1 which granted an advance of about 10 per cent in wages to union employees. The increased cost of labor and materials, together with the enormous growth in the use of private automobiles in the company's territory, has made it impossible for the company to pay even its current expenses. Irreparable injury awaits the road if the commission fails to grant early relief.

WHY AN INCREASE MUST COME

Mr. Ballantine pointed out that the forecast of the commission in its celebrated decision of 1914 which granted to the company a 6-cent fare unit has not been realized with respect to financial improvement. Following that decision, the company was able to pay 4 per cent dividends for one year; 3.25 per cent was declared for the next year, and now the dividend has been wiped out. Neither could the road pay off any of the back operating deficit or take off certain old power plant structures from its books, and it has been impossible to assign 20 per cent of the operating revenue for maintenance and depreciation as recommended. Since 1914 the cost of materials has increased at least from 25 to 100 per cent. The recent arbitration award increased wages by about $130,000 in the three years ending June 30, 1919, assuming the same service is furnished. The company no longer has any net revenue. It is planned to increase the fare unit from 6 cents to 7 cents in the cities of Newton and Waltham and to charge 8 cents in the outer suburban and rural territory traversed west of Newton Lower Falls and in the Lexington-Concord district. The company operates 130 miles of line, of which 114 miles is single track, and its average cost is $40,000 per mile, or about the same as other Massachusetts roads excepting the Boston Elevated Railway. The population of the territory served has increased since 1910 from 175,000 to 190,000. Mr. Ballantine said that the building of garages has exceeded the building of houses in the territory.

The company's total capitalization, about $5,000,000, was issued under approval of the commission or its predecessor. The road needs at least $220,000 a year more revenue at present, and the estimated increase in earnings from the proposed 7-cent and 8-cent fare units, allowing for falling off in traffic due to the higher rates, is only $120,000 a year.

CHAIRMAN OF ARBITRATION BOARD SPEAKS

Henry C. Sawyer of Woburn, Mass., chairman of the arbitration board which recently raised the wages of the employees, addressed the commission on behalf of the proposed increase. He pointed out that the evidence considered by the board in the wage case showed that the road is most efficiently managed; that its executive salaries are small to a degree of inadequacy; that no possible retrenchment appears feasible and that the administration of the company's funds is of the highest order. The arbitration board appreciated that the wage increase would strip the company of its dividends, but a majority felt that through appeal to the commission higher fares could be secured to give the necessary increased revenue. It was the intention of those making the award to establish wages on the basis of the purchasing power of 1900 wages. "The company was already shrieking for relief," said Mr. Sawyer, "but we regarded the pronouncement of the commission regarding the necessity of giving capital a living wage in the Middlesex & Boston decision as absolutely fundamental." The speaker also pointed out that the company has suffered from jitney competition, but it has lost revenue particularly through the utilization by contractors of low-priced automobile trucks in which laborers are transported to and from the job instead of by the electric railway facilities as formerly.

The hearing was adjourned to June 25 to enable the company's exhibits to be printed for general distribution.

Los Angeles Excludes Jitneys

Platform Men Help to Secure Ordinance Which Places $10,000 Bond on Each Bus and Excludes Them from Business District

At the election on June 5 the city of Los Angeles passed an ordinance to exclude the jitneys from the business center of the city. The forbidden area is bounded on the north and south by First and Eighth Streets, and on the east and west by Main, Spring, Broadway and Hill Streets. Other features of the ordinance are that in the districts which the jitneys cover they must operate every day from 6 a. m. until midnight and each bus must carry a $10,000 indemnity bond.

The success of the campaign to secure the passage of this ordinance is attributed in large measure to employees of the Los Angeles Railway, who organized 3000 strong and made a determined effort to have their side of the question generally known. The organization, known as the Co-operative Association of Los Angeles Railway Employees, was divided into ten sections, each controlled by a section executive committee, which appointed a member to serve on a central executive committee. While the ordinance was in process of formation the central committee sent out among the business men a brief statement of their side of the case. They pointed out the conditions to show why the company was hard pressed and could not meet the demands of employees for a wage increase that would correspond with the increased living expenses. The beginning of this campaign to enlighten the public on the significance of jitney competition was reviewed in the issue of the ELECTRIC RAILWAY JOURNAL for May 5, page 846.

HOW THE CAMPAIGN CONTINUED

When the ordinance was complete the original committee was supplemented by additional members and representatives of the Pacific Electric Railway, so that about 125 workers were available for making a house-to-house canvass for signatures to the initiative petition. In addition, all conductors of both railways were supplied with copies of the petition and on final count it was found that 65,000 signatures had been secured. Another circular was then given out showing that the 3000 Los Angeles Railway employees and their dependents, totaling 10,000 people, were vitally interested in the movement, that the city must depend upon street car extension and not uncertain bus business on which to build up its outlying districts, that the 400 jitney buses did not afford any certainty of service, and that the $10,000 bond for groups of buses instead of individual buses afforded practically no protection. Letters were sent to civic bodies, all of which with one exception indorsed the ordinance. Two weeks before the election a document entitled "The Deadly Parallel," comparing the initiative ordinance with the measure proposed by the jitneys for repealing present regulation, was circulated from house to house, sent to automobile owners and business men, inclosed in all correspondence from the two railway companies, and were distributed by conductors on the cars.

On the day of the election the railways declared a general holiday and, with the assistance of friendly taxicabs and private automobiles, 550 automobiles were available for bringing voters to the polls. Altogether about 1400 employees were engaged in this work. Of about 95,000 votes cast, a majority of 9981 favored the initiative ordinance to regulate jitney buses.

Seattle Fight Thickens

Traction Company Demands that the City Curb Jitneys—Suits Brought Against "Free Buses"

The Puget Sound Traction, Light & Power Company has filed with the Mayor and City Council of Seattle a general protest against the jitney as a competitor, and asserts that if the city permits the jitney buses to continue to operate in direct violation of the law, causing financial injury to the company, the city will be held financially responsible. A. W. Leonard, president of the company, made, in part, the following statement in his formal protest to the city:

"The company is operating its street railways under franchises and has given and is giving the service called for by them. There are now operating in the city more than 150 jitneys under the pretense that the law requiring the operators to execute the bond thereby prescribed is unconstitutional. The Supreme Court of the State has repeatedly upheld the law. The Superior Court, in a suit instituted by those who are now illegally operating, has again upheld the law and has dismissed their case. Notwithstanding these facts, the violators are actually operating upon the lines of the company's street railway. The city could easily stop its continuance by requiring the operators of such vehicles to produce to the police department their authority for operating."

Attorney Ralph S. Pierce for the jitney drivers said, in part:

"We are up against a law that we cannot comply with, and therefore we hold such a statute to be unconstitutional. The act says we must furnish surety bonds to indemnify persons found to have been injured by our negligence or carelessness. The bonding companies say they do not want the jitney business and refuse to issue bonds, or else they make the conditions impossible. The law compels us to give this surety or lose our cars and our livelihood, but it does not compel the bonding companies to write the bonds for us. The statute is one-sided in its operation."

In a communication to the Puget Sound Traction, Light & Power Company, answering President Leonard, Mayor H. C. Gill declared that the Police Department of the city is too small to hold up jitney drivers and require them to show the rights by which they operate. He said it would be similar to compelling the company's employees to show authority for the company operating. In his opinion the jitney fight is one to be conducted under a state statute. He regarded it as purely a company affair, not involving the public benefit, and said the company should, therefore, conduct the prosecutions.

The jitneys cannot obtain an injunction to prevent prosecution so have resorted to operating "free buses" for contributions. The company has brought action against three operators charging that they operated vehicles for hire without legal permits. According to James B. Howe, counsel for the company, other free-bus operators will be made defendants in criminal as well as civil suits under the jitney bonding law of the 1915 Legislature.

Rate Dispute in Illinois

The State of Illinois has enjoined the railroads from charging the 2.4-cent passenger rate as permitted by the Interstate Commerce Commission, and the roads have enjoined the State from prosecuting them. The State bases its right to injunction upon the decree of the Illinois Public Service Commission which permits only a 2-cent rate. The conflict between the federal and State authorities arose from the fact that the railroads charged 2.4 cents a mile between points in Illinois and St. Louis, Mo., while the rate from the Illinois side of the Mississippi River to any point in Illinois was only 2 cents a mile. St. Louis claimed this was a discrimination in favor of East St. Louis, Ill., just across the river, and the Interstate Commerce Commission ordered the railroads to make the rates uniform—either to lower them to St. Louis or raise them in Illinois.

Governor Lowden has sent telegrams to Senators Sherman and Lewis, urging them to take up the dispute with President Wilson and Attorney-General Gregory. The case is expected to afford the first definite basis for settlement of the clash between inter-state and intra-state rates.

Key Route Asks Fare Increase

Terms of Recent Strike Settlement Add $30,000 Annually to Present Operating Deficit

The San Francisco-Oakland Terminal Railways, Oakland, Cal., has filed with the Railroad Commission of California an application for an increase in rates, stating that present fares are "unduly low, non-compensatory, and confiscatory." The company says that the value of the operative property devoted exclusively to the service mentioned is $8,304,104, and that its total earnings from this source for the last sixteen months were $1,595,043. Its operating expenses and taxes were $1,336,893, leaving net earnings of $258,150. Bond interest and fixed charges are placed at $485,598, leaving a deficit of $227,447. A special charge of $237,442 for the abandonment of an old pier trestle is added to this, making a total deficit of $489,071 for the sixteen months of operation of the Key Route ferry service and local lines.

To this deficit the company states additional labor expense has been added by the terms of the strike settlement, which were reported on page 840 of the ELECTRIC RAILWAY JOURNAL for May 5, and which make it incumbent upon the company to employ thirty additional deck and engine-room officers, thus increasing operating expenses $30,000 a year. The arbitration board which determined the terms of the strike settlement was assisted by Judge Maurice T. Dooling, who held that the wage schedule asked by the employees should not be imposed upon the company, thereby entailing the additional expense referred to, without an application being made for a readjustment of passenger fares. It was his view, as expressed later in writing, that inasmuch as the company, and the men as well, were working for the public, if, in the interest of the men and the public whom they served it was fair to the men to give them the schedule they demanded, it was also fair that the public should compensate the company for its additional expense made necessary in the performance of its service to the public.

More Skip Stops in Baltimore

The United Railways & Electric Company, Baltimore, Md., will apply the skip stop to several additional lines. The company reached its decision to add to the number of skip-stop lines as the result of a careful study of the plan on the Edmonson and North Avenue lines upon which it has been in operation for some time. The application of the skip stop to these lines was described in an article in the issue of the ELECTRIC RAILWAY JOURNAL for June 2, page 992.

Officials of the company say it has been clearly demonstrated that there is a considerable saving of time, that this saving has been effected without increasing the element of danger, that a greater number of car trips can be made per day, and that the people prefer the quicker method of transportation. In support of the statement that a better service is rendered, the daily statements of the two skip-stop lines show that more than forty additional round trips are being run than formerly, and the total additional daily car-miles operated on the two lines is greatly in excess of 500.

Many letters have been sent to the Public Service Commission and to the railway company favoring and opposing the plan. An examination of these shows that 63 per cent approved the skip stop without qualification; 25 per cent approve but object to having their corner cut out; and only 12 per cent are opposed to the skip-stop principle.

L. I. R. R. Seeks City Fare Increase

A petition was filed on June 8 by the Long Island Railroad with the Public Service Commission for the First District of New York asking that the order of the commission fixing the 5-cent far on trains between Flatbush Avenue and Railroad Avenue be discontinued and that the company also be permitted to discontinue selling twenty-trip books for $1. The petition says:

"Such 5-cent fare rates are non-compensatory for the service rendered, unreasonably low, burdensome and confiscatory under existing conditions. The company prays that the order be abrogated so that the company can file a tariff to provide for a 10-cent fare between East New York and Flatbush Avenue, and Warwick Street and Flatbush Avenue and Railroad Avenue and intervening points, and to discontinue the twenty-trip books now selling for $1."

The present rate of fare was made effective following hearings held by the commission in July, 1911.

The stations mentioned are all on the electrified line of the company extending from Flatbush Avenue, Brooklyn, to Jamaica. Railroad Avenue is the last station on the line outgoing from Brooklyn within the limits of Kings County. Previous to 1911 the 5-cent fare extended only to Warwick Street. It was agreed, however, at that time that the 5-cent fare would be extended to Railroad Avenue, thus making the 5-cent fare uniform for all the stations within Kings County. It was distinctly stated then that this was in the nature of a concession on the part of the company, and that it was not to be construed into meaning that the company could further extend the 5-cent limits into Queens County. With the consent of the company the commission then entered the necessary formal order.

Why Holyoke Road Asks Increase

President Pellissier Reviews Financial Status of the Company and Suggests Remedies

In response to an invitation from the Chamber of Commerce, L. D. Pellissier, president of the Holyoke (Mass.) Street Railway, addressed the board of directors of the chamber on June 4 and set before the members the financial condition of his company. As reported in the ELECTRIC RAILWAY JOURNAL for June 9, page 1070, the company has applied for permission to rearrange its fare schedules to secure an increase in revenue.

Mr. Pellissier presented a very comprehensive statement by which he endeavored to show that the capital invested by the company had been wisely expended, that the property is being operated efficiently and economically, and that the gross income is not sufficient to provide for depreciation and a fair return on the investment. He said that the investment per mile of track is $9,361 less than the average of street railways in the State, as shown in the 1916 report of the Public Service Commission. A table of operating expenses per car-mile of railways in the State for the years since 1908 showed those of the Holyoke Street Railway to be less than the average. Additional gross income to the amount of $150,000 annually is necessary in order to provide a return of 6 per cent on money invested. These calculations were based on 1916 figures.

Company officials believe that an increase in compensation or a decrease in distances of travel for one fare or both will go far toward providing sufficient income for the present needs. Mr. Pellissier said he hoped the public would look favorably upon the request for more revenue.

Iron Railings Mark Safety Zones.—Municipal authorities of Oklahoma City, Okla., will install iron railings at busy corners to mark safety zones for pedestrians and persons using street cars. Since the recently enacted traffic ordinance has been in effect chalk lines have marked safety zones, but these have proved inadequate.

More One-Man Cars in Bellingham.—The Puget Sound Traction, Light & Power Company, Bellingham, Wash. has replaced the heavy two-men cars on its main line with one-man cars and is giving ten-minute instead of fifteen-minute service. One-man cars have been in use on other lines in Bellingham for some time and are giving satisfaction.

Auto Bus Company Incorporated.—An auto bus company has been formed in Fort Worth, Tex., with George H. Clifford, local manager of the Northern Texas Traction Company of that city, as manager. The new company is capitalized at $20,000 and was formed because the traction company cannot operate buses under its present charter. The buses, which will run on schedule, will furnish transportation to Lake Worth and were expected to be in operation by June 15.

One-Way Streets Authorized.—An amendment to the motor vehicle act recently passed by the California State Legislature, provides that "local authorities of any city, town, or city and county may impose additional restrictions to those herein contained applicable to vehicles exclusively used in the carrying of merchandise or articles of freight and of a carrying capacity in excess of 1 ton in weight, and may designate certain streets whereon heavily laden vehicles may be excluded or declared to be 'one-way' streets and may further restrict or prohibit the use of trailers."

Jitneys Get Restraining Order.—Chancellor Martineau has ruled that the city of Argenta, Ark., has no right to regulate the operation of automobiles engaged in interurban service and has issued a permanent restraining order enjoining the city from enforcing an ordinance which places a monthly license on jitneys operating to Fort Roots, which is beyond the city limits. The petition for injunction was filed in Chancery Court on May 18 by Thomas Keath and twenty-four operators. The ordinance exacted a license of from $4 to $12 per month on each jitney, according to its passenger capacity.

United Railways Organizes for Safety.—To make its safety work more effective than ever before the United Railways & Electric Company, Baltimore, Md., has organized a central safety committee with sub-committees in all departments and on all lines of the company. The object is to interest every employee in the safety measures of the company and to make each feel his or her responsibility in this work. M. J. McDonough, heretofore assistant traffic manager, has been appointed chairman of the committee on safety work and will devote his entire time and attention to this matter. The safety committee's activities will be extended to the public through an educational campaign for disseminating the safety doctrine.

New York & North Shore Wants 7 Cents.—The New York & North Shore Traction Company, Roslyn, N. Y., has taken steps to obtain permission to increase its fares from 5 cents to 7 cents. It declares that the present 5-cent fare is insufficient. An increase of 2 cents in the fare, it is said, would enable the company to continue to operate, make proper reservation for its surplus, maintain its standard of equipment and service and pay interest on its bonds. No dividend has been paid on the stock and none is likely to be paid for an indefinite period. The gross earnings of the company have decreased steadily in the last two years, and during the first ten months of the present fiscal year the road has been operated at a loss.

Safety Campaign Receives Support.—The safety work of the Kansas City (Mo.) Railways has been extended to the enlistment of public support in movements that will promote expeditious handling of vehicles and crowds. The company has co-operated with the city authorities by displaying dash cards with the words, "Don't Be a Jay Walker." The local city club became interested, and with the help of E. E. Stigall, purchasing agent of the company, has started a campaign against pedestrians cutting corners and loitering in busy thoroughfares. The club had several thousand cards printed with the injunction to jay walkers, and traffic rules approved by the police department. The Boy Scouts have also been enlisted to give directions to pedestrians.

Better Service Asked in Tacoma.—A number of Tacoma residents have filed a formal complaint with the Public Service Commission of Washington against the Tacoma Railway & Power Company, alleging that the car service on the Tacoma Avenue and Center Street lines is insufficient. The complainants request that the fifteen-minute service on the Tacoma Avenue line, which on May 14 was replaced by a forty-minute schedule, be re-established. According to the complaint, more than 100 business houses are dependent on the Tacoma Avenue street car line, while Center Street is in the factory district of the city, and hundreds of workmen and school children have been greatly inconvenienced by discontinuance of the former service.

Knoxville Jitneys Oppose Ordinance.—The final reading of a new jitney ordinance has been postponed by the City Commissioners of Knoxville, Tenn., in order that they may consider a petition presented by A. L. Butcher for the jitney operators. The petition protests against the restrictions the ordinance places upon jitneys, which, among other things, requires them to have regular schedules for operation and certain places at which to discharge and take on passengers. It was claimed by Mr. Butcher that such restrictions tend to hamper the service of the jitneys and that the people patronizing them are satisfied with the present service. Mayor McMillan said that although the petition would receive consideration the ordinance was intended for the benefit of the public and not for the convenience of the operators.

New Auto-License Law.—A bill recently passed by the New York Legislature requires all who own or drive automobiles in New York City to have licenses. The card issued with the license by the Secretary of State must be carried by the operator for identification. The law had its inception in agitation by the Safety First Society of New York. It provides, besides a quick means of identification for every motor vehicle operator, power for the Secretary of State to suspend or revoke the license of any operator for the following offenses: A third or subsequent violation of the speed law, conviction for felony, disability of the holder of a license by reason of intoxication or use of drugs, gross negligence by the operator as a result of which person or property is injured, going away without stopping or giving name and address after causing injury to any person or damage to any vehicle, and operating a motor vehicle in a manner showing a reckless disregard for the life or property of others.

Badges for Jitney Drivers.—The Board of Street and Water Commissioners of Newark, N. J., has issued identification badges to be worn by all jitney drivers in the city. Complaints by the public that drivers had frequently given fictitious names and thus caused innocent drivers to be called to the City Hall for explanations for offenses resulted in the adoption of the badges. The new rule will be enforced by the traffic supervisor. It is claimed that half of the traffic accidents have been caused by drivers placed in temporary charge of the cars to make only one or two trips who disregarded traffic laws in their eagerness to obtain fares, and it was almost impossible to place the blame. There is also a movement on foot on the part of more careful auto owners to have barred from the jitney business men whose cars are operated by others exclusively, and who discharge their drivers unless a stated sum is returned each day. This practice leads to reckless driving in order to meet the owners' demands.

Jitney Ordinances Amended.—Three amendments to the traffic ordinances of Springfield, Mo., have been passed by the City Council of that city in an effort to check violations of the traffic laws. The first provides that every jitney or taxicab must have the city license number painted on both sides of the car in Gothic letters not less than 3 in. high. A second amendment provides that every jitney in the service shall be provided with a green lamp, to be burned from half an hour after sunset until half an hour before sunrise, and that every taxicab shall be provided with a yellow lamp, to be burned during the same period. The third provides that no vehicle shall stand within the limits of a street intersection, within 10 ft. of such intersection, within 15 ft. of a fire hydrant or within 60 ft. of an intersection property line where street cars take on or discharge passengers. Another amendment will be introduced later to prohibit jitney drivers from soliciting business by shouting that their cars are about to leave for a certain point.

Fare Increase Granted to Chicago & Joliet.—The Public Utilities Commission of Illinois has granted a fare increase to the Chicago & Joliet Electric Railway, which will give an average rate per mile of 1.87 cents as against the present average of 1.34 cents and allow the company to earn a return on its investment of slightly more than 6 per cent. The fare from Joliet to Lockport has been increased from 5 to 10 cents and from Joliet to Chicago from 40 cents to 55 cents, with the round trip increased from 75 cents to $1. The fare to all other points has been correspondingly increased. In its decision the commission found that the earnings of the road under the present tariff, based on figures furnished by the company and on data obtained by an engineer employed by the commission, were not sufficient to pay a reasonable return on the investment in the property. The company will file an amended schedule of rates on or before July 20 with not less than three days' notice to the commission and the public, and the tariff will thereafter become effective. A maximum charge of 2 cents a mile with a minimum charge of 5 cents is set forth by the commission.

Legal Notes

CHARTERS, ORDINANCES, FRANCHISES

ILLINOIS.—*Benefits as Well as Damages to Be Considered in Suit for Realty Damages Against Elevated Railway.*

In an action for damages to realty from the construction of an elevated railroad, the benefits to the premises by reason of the increased travel, etc., may be considered in determining whether the premises have been damaged. (Brand et al. v. Union Elevated Railway, 115 Northeastern Rep., 532.)

MINNESOTA.—*Motorman Cannot Be Called for Cross-Examination Under "Managing Agent" Statute.*

The motorman of a street car is not a "managing agent" of the company within the meaning of the statute which authorizes an adverse party to call a managing agent of a corporation for cross-examination. (Moore v. St. Paul City Railway, 162 Northwestern Rep., 298.)

MISSISSIPPI.—*Cutting Shade Trees—Nominal Damages.*

Where a light and railway company, through its agents, trespassed on plaintiff's property without her consent and cut the limbs of her ornamental shade trees standing thereon, the company was liable for nominal damages for invading plaintiff's rights, though she showed no actual damages. (McGhee v. Laurel Light & Railway Co., 74 Southern Rep., 434.)

NEW YORK.—*The Crossing of One Line With Another Does Not Make It a "Connecting Branch."*

Under railroad law (Consol. Laws, Chap 49, Sec. 181) an electric railway company is not obliged to give transfers from one line to another simply because the lines cross each other. (Oatman v. International Railway, 163 New York Sup., 495.)

LIABILITY FOR ACCIDENT

INDIANA.—*Free Pass—Stipulation Against Liability for Accident.*

A pass issued by a railroad to an officer of another railroad, in exchange for passes issued by his road to officers of the railroad first mentioned, as authorized by law, is a gratuity, so that a provision therein that the user should assume risk of accident is binding, preventing recovery for his death while riding thereon, unless caused willfully.

Evidence in action for death, by collision of trains, of person riding on free pass, held not to support a charge of willful killing. (Fort Wayne & Wabash Valley Traction Co. vs. Justus, 115 Northeastern Rep., 585.)

MICHIGAN.—*Passengers Must Be Safely Aboard Before Car Starts.*

A passenger who was thrown from the platform of an interurban car which he boarded just as it started claimed that he was delayed as he was waiting for others to enter. The court charged, among other things, that one who boards a car after it had left its regular stopping place does so at his peril, disregarding plaintiff's contention that he boarded the car in safety. Held, that as one need not call himself to the attention of the conductor before becoming a passenger, the charge was erroneous, not presenting the issue involved, and misleading the jury. (McKenzie v. Detroit, Jackson & Chicago Railway, 161 Northwestern Rep., 970.)

RHODE ISLAND.—*Passenger on Running Board Struck by Pole.*

An electric railway company is not compelled so to construct and locate its tracks and poles that it will be physically impossible for a passenger riding on the running board of a car to bring himself in contact with the poles. It is sufficient if the company provide for the safety of passengers while acting within the scope of their privileges, or within such limits as may be reasonably anticipated. Hence, when a passenger on the running board tried to pass outside of another on the running board and was struck by a pole, the company was not liable. (Milliken v. Rhode Island Company, 99 Atlantic Rep., 1023.)

Personal Mention

Thomas Fitzgerald, general manager of the Cincinnati (Ohio) Traction Company and the Ohio Traction Company, has resigned to join the officers' reserve corps at Fort Benjamin Harrison.

P. B. Rice, electrical engineer of the United Gas & Electric Enginering Corporation, New York, N. Y., has resigned to become mechanical and electrical engineer of the International Railway, Buffalo, which is controlled by the former company.

C. U. Peeling, heretofore local manager of the electric light and gas properties at Oshawa, Ont., has been appointed manager of the Cornwall Street Railway, Light & Power Company, Ltd., and the Stormont Electric Light & Power Company, Ltd., at Cornwall, Ont., succeeding William Hodge.

Hermon N. George, assistant chief claim agent of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has resigned to take up the practice of law. Mr. George was formerly employed in a clerical capacity and later as a foreman for the Standard Steel Car Company. He entered the service of the Mahoning & Shenango company in the claim department under J. W. Sturdevant in 1909, working in the Sharon and New Castle districts. About four years later he was made assistant chief claim agent. Mr. George is a graduate of the Pennsylvania State Normal School at Slippery Rock.

H. G. Gilpin, assistant general manager of the Ohio Electric Railway, Springfield, Ohio, has been promoted to the position of general manager succeeding A. Benham. Mr. Gilpin has been assistant general manager of the road with office at Lima for six years. Previous to this period he was connected with the operating department of the Cincinnati Traction Company for the same length of time, part of which he served as assistant superintendent. Mr. Gilpin has been associated with W. Kesley Schoepf, now president of the Ohio Electric Railway, for several years having been under him in 1899 during a short connection with the City & Suburban Railway in Washington, D. C. He later was identified with the Washington Railway & Electric Company, Washington, D. C., for three years after which he went to Cincinnati. The Ohio Electric Railway controls and operates about 620 miles of electric railway lines. It also does a general lighting and power business.

L. M. REELY

Lee M. Reely has been promoted to the position of welfare superintendent of the United Railways & Electric Company, Baltimore, Md., as successor to J. B. Duvall, who was made assistant superintendent of transportation. Mr. Reely's promotion was in recognition of the ability with which he discharged his duties as assistant to Mr. Duvall in the welfare work. When this department was organized about a year ago Mr. Reely became Mr. Duvall's aide and shouldered a very large portion of the work. He entered eagerly upon the execution of his duties and his chief soon found him an indispensable adjunct. It was quite natural that the mantle of the superintendent should fall upon the young man's shoulders when promotion took the head of the department to another field. Mr. Reely has been with the United Railways for several years. Before he entered the welfare work he was in the office of the assistant general manager, then James R. Pratt, who is now vice-president and general manager of the United Railways & Electric Company.

John B. Duvall has been appointed assistant superintendent of transportation of the United Railways & Electric Company, Baltimore, Md., succeeding Herbert B. Flowers. Mr. Duvall has grown up in the street railway business of that city. He entered the service when he was in his teens as an office boy and applied himself diligently to the study of his duties. Within a few years he was occupying a position in the claim department and was later stepped up to an important position in that branch of the work. The United Railways has for many years displayed a substantial interest in the welfare of its employees, and when the demands of the work upon those in charge made it necessary to create a separate department Mr. Duvall was chosen as its head. He organized the work. which previously had been divided among various departments and employees, and systematized it so as to eliminate much unnecessary effort. Following the annual election of officers this year, when Mr. Flowers was chosen assistant general manager, Mr. Duvall was selected to succeed him.

J. B. DUVALL

Frank Rusch has been appointed superintendent of motive power of the Puget Sound lines of the Chicago, Milwaukee & St. Paul Railway, with office in Tacoma.

Albert Benham, heretofore general manager of the Ohio Electric Railway, Springfield, has been appointed general manager of the Cincinnati (Ohio) Traction Company and the Ohio Traction Company as the successor to Thomas Fitzgerald. Mr. Benham has been connected with the Ohio Electric Railway since 1908, for the first five years of that period as assistant general manager. He was born in Ohio in 1868. At the age of twenty-three he entered the service of the Fifth Avenue Cable Company, Pittsburgh, Pa., and remained with that company and the Consolidated Traction Company, Pittsburgh, for ten years. In January, 1901, he became inspector and later assistant general superintendent for the Cincincinnati Traction Company, which he served until 1906. The next two years found him in the position of general superintendent for the Indiana, Columbus & Eastern Traction Company, Cincinnati, Ohio, with headquarters at Columbus, after which he accepted the position of assistant general manager of the Ohio Electric Railway. Mr. Benham is a past president of the Central Electric Railway Association, having been succeeded by Mr. Wilcoxen last March.

A. BENHAM

Obituary

John F. Calderwood, former vice-president and general manager of the Brooklyn (N. Y.) Rapid Transit Company, died on June 14, according to a late press despatch. Failing health caused his retirement from business three years ago and since then he has resided at Long Lake, near Minneapolis, Minn.

A. B. Chichester, claim agent of the Little Rock Railway & Electric Company, Little Rock, Ark., died on May 30 following a stroke of paralysis. Mr. Chichester was born in Augusta, Ga., in 1866 and went to Little Rock early in life. He served as deputy sheriff and later as city detective. He had been employed by the Little Rock Railway & Electric Company for ten years and was regarded by his associates as a loyal and conscientious worker and a very capable man in his position with the company.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

FRANCHISES

Wrentham, Mass.—The Milford, Attleboro & Woonsocket Street Railway has asked the Public Service Commission for its approval of the relocation of its tracks in the State highway on South Street, Wrentham.

Cincinnati, Ohio.—The Rapid Transit Commission, City Council and officials of the Cincinnati, Newport & Covington Street Railway are endeavoring to revise the proposed twenty-five-year franchise to the latter in such a way as to be satisfactory to all. The railway has arranged to have its terminal in the Dixie Terminal Building, but the commission feared that its tracks on Walnut Street might interfere with the construction of the rapid-transit loop. Polk Laffoon, secretary of the Cincinnati, Newport & Covington Railway, urged prompt action by Council at a recent conference, and Attorney Harry Lynch, acting for the terminal building, stated that it will be completed by the time work on the loop tracks at Third and Walnut Streets is begun.

Columbus, Ohio.—The Columbus Railway, Power & Light Company on June 8 notified the Franklin County Commissioners that it could not accept the franchise proposed by them for the Columbus-Westerville interurban line and that its own proposition, submitted recently, had been withdrawn. It further notified the commissioners that the work of removing the tracks will be begun on June 14. Residents of Westerville and owners of subdivisions and private property have become very much wrought up over the matter and an attempt will be made to secure a settlement between the company and the commissioners. About 1200 people use the line daily.

Salt Lake City, Utah.—The Salt Lake & Utah Railroad has received permission from the Public Utilities Commission of Utah to construct a line from Granger to Magna.

Bellingham, Wash.—The Puget Sound Traction, Light & Power Company has asked the City Council for permission to plank the company's right-of-way on Lake Street, between Ellis and Humboldt Streets. If the request is granted a double track will be laid on that street and a connection with the Lake line will be made via the same route some time in the near future.

TRACK AND ROADWAY

Oakland, Antioch & Eastern Railway, Oakland, Cal.—Application has been made by the Oakland, Antioch & Eastern Railway to the Railroad Commission of California for permission to discontinue the operation of the Sacramento Valley Electric Railroad from Dixon Junction to Dixon, which it operates under lease.

United Railroads, San Francisco, Cal.—An agreement has been entered into by the United Railroads and the city officials of San Francisco whereby the Municipal Railways can use the poles and span wires of the United Railroads on Market Street and Van Ness Avenue.

Southern Traction Company of Illinois, East St. Louis, Ill.—It is reported that negotiations are under way for the sale by the receivers of the line of the Southern Traction System, extending from Belleville to St. Louis, to the Michigan Central Railroad. It is understood that the Michigan Central Railroad will operate only coal trains on the line, which originally was intended to be for electric passenger and freight traffic.

Tri-City Railway, Davenport, Iowa.—This company is asking for bids for the construction of its new line on Rock Island arsenal island.

Wichita Railroad & Light Company, Wichita, Kan.—This company will construct new tracks across the concrete bridge spanning the Arkansas River at Douglas Avenue.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me.—Work has been begun by this company on the construction of an extension on Webber Avenue, Lewiston.

United Railways & Electric Company, Baltimore, Md.—This company has awarded a contract to the Union Switch & Signal Company to provide signal protection for its drawbridge over Bear Creek in connection with the automatic block installation.

Saginaw-Bay City Railway, Saginaw, Mich.—Work will be begun at once by the Saginaw-Bay City Railway on the reconstruction of its tracks on the Genesee line from Warren Avenue west to the approach to the Genesee Avenue bridge, 100-lb., 6-in. T-rails being used. It is expected that the work will cost about $30,000.

United Railways, St. Louis, Mo.—A plan is being considered by the United Railways to remove its tracks on Washington Avenue from Jefferson to Compton Avenue and lay them on Lucas Avenue, thereby opening up Washington Avenue as an east-and-west artery for traffic.

***Bathurst Electric & Water Power Company, Ltd., Bathurst, N. B., Can.**—This company has asked the New Brunswick Legislature for an amendment to its charter to give it authority to operate an electric railway in Bathurst and vicinity. J. P. Lager, Bathurst, president and general manager.

Rahway Valley Railway, Summit, N. J.—Negotiations have been opened with the Public Service Railway by the Rahway Valley Railway, which has the right-of-way and will extend and electrify its line from Summit to a point near Boyden Avenue, Hilton, with a view to reaching a traffic agreement whereby through service over that route from Newark to Summit may be had.

Brooklyn, N. Y.—The Public Service Commission for the First District of New York, through Chairman Straus, has addressed the Board of Estimate and Apportionment of New York City, asking that body to act within a short time upon the various propositions looking to traffic relief in central Brooklyn, including the proposal for relocating the tracks of the Fulton Street elevated line in Adams Street and for laying out a connection between the Fulton Street elevated line and the Fourth Avenue subway.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York recently received bids for the installation of tracks on the Pelham Bay Park branch of the Lexington Avenue subway. The line is three-tracked, part subway and part elevated, extending from a junction with the Lexington Avenue line near 135th Street and Park Avenue to Eastern Boulevard and Pelham Bay Park. The low bidder for the work was the Terry & Tench Company, Inc., New York, whose offer was $363,860. A number of contracts have been awarded by the Interborough Rapid Transit Company to the Union Switch & Signal Company to provide interlocking and automatic block signal apparatus on several of its lines. The interlocking plants are to of the electro-pneumatic type; the automatic signals in the subway of the Interborough light type, those on the suburban lines of the daylight type with color indication, and the interlocking signals on the suburban lines of the electropneumatic type, with electropneumatic train stops.

Lake Shore Electric Railway, Cleveland, Ohio.—It is reported that this company is considering the double-tracking of its line on West Erie Avenue, Lorain.

United Railways, Portland, Ore.—Construction work has been begun by the United Railways on an extension from Wilkesboro to Tillamook.

Westside Electric Street Railway, Charleroi, Pa.—This company reports that it is in the market for 125 tons of 70 to 80-lb. T-rail, new or rerolled.

Johnstown-Somerset Traction Company, Johnstown, Pa.—Contracts have been awarded by the Johnstown-Somerset Traction Company for the ties, track and trolley wire necessary for the completion of its line between Johnstown and Jerome, and it is expected that the line will be completed before the end of the summer. Cars and other equipment have been ordered, it is stated. Kent Miller, Somerset, secretary. [April 28, '17.]

***Columbia, S. C.**—Right-of-way is being secured for the construction of an electric railway from Columbia to Greenwood via Lexington and Saluda. As proposed, the new line would connect with the Piedmont & Northern Railway at Greenwood. Frank Haskell, Columbia, chief engineer.

Austin (Tex.) Street Railway.—This company will construct an extension of its South Austin line to Fairview Park.

Dallas Northwestern Traction Company, Dallas, Tex.—Bids are being received by the Standard Utilities Construction Company (C. F. Hopkins, Tulsa, president), for the construction of the proposed railway of the Dallas Northwestern Traction Company from Dallas to Denton. [June 9, '17.]

Dallas Southwestern Traction Company, Dallas, Tex.—This company has awarded a contract to the Creek Construction Company, Sapulpa, Okla., for the construction of its proposed line from Dallas to Cleburne. The work of securing right-of-way for the line has been begun. F. R. Perkins, engineer in charge of construction. [March 17, '17.]

Houston, Gonzales & San Antonio Traction Company, Houston, Tex.—A contract has been awarded the Birmingham Construction Company, Birmingham, Ala., for the construction of this company's line from Houston to San Antonio, and it is expected that work will be begun this month. Steve Holmes, Gonzales, president. [March 3, '17.]

Ogden, Logan & Idaho Railway, Ogden, Utah.—This company will construct an extension of its Washington Avenue line from Twenty-eighth Street to Thirty-sixth Street and from Thirty-sixth Street to the Riverdale Road.

Virginia Railway & Power Company, Richmond, Va.—It is reported that the Virginia Railway & Power Company contemplates the construction of several new double-track lines and also some single track in Norfolk.

SHOPS AND BUILDINGS

Kansas City, Mo.—An ordinance has been passed by the City Council of Kansas City locating the union station for the use of the interurban railways at the northeast corner of McGee and Tenth Streets, extending through to Oak Street, with entrances both on Tenth and McGee Streets. C. C. Peters, president of the Interurban Central Station Company, which will build and operate the station, has announced that construction will be begun as soon as the ordinance is signed by the Mayor.

POWER HOUSES AND SUBSTATIONS

British Columbia Electric Railway, Ltd., Vancouver, B. C.—This company contemplates extending its transmission lines to Hollyburn.

Union Traction Company, Coffeyville, Kan.—This company has entered into a contract with the Kansas Gas & Electric Company for the supply of power for its system from Parsons, Kan., to Nowata, Okla. The Kansas Gas & Electric Company, it is reported, will erect a new electric plant to take care care of its increasing business.

Union Light & Power Company, Junction City, Kan.—This company plans the construction of underground coal pits for storing coal in large quantities. The company will also install two large engines to take care of the increasing demands on the plant.

Milford & Uxbridge Street Railway, Milford, Mass.—This company reports that within the next ten weeks it expects to place contracts for two 750-kw. rotary converters and one 300-kw. rotary converter with transformers and switchboards.

Kansas City (Mo.) Railways.—Work has been begun by the Kansas City Railways on the erection of a substation at Fifty-ninth Terrace and Swope Parkway.

Interborough Rapid Transit Company, New York, N. Y.—A new 60,000-kw. unit consisting of a high-pressure and two low-pressure turbines, each coupled to a generator, will be installed by the Interborough Rapid Transit Company at its Seventy-fourth Street station. The turbines and generators are being furnished by the Westinghouse Electric & Manufacturing Company.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Helping Railways to Reduce Expenses

Results Make for Lower Selling Costs—Training Railways to Do Their Own Welding

By W. R. HULBERT
Sales Manager, Goldschmidt Thermit Company, New York City

The inventive powers of the engineers employed by some manufacturers of electric railway supplies are being taxed to the limit these days in order to find substitutes for raw materials, formerly obtainable but now impossible to get either on account of imports being cut off or through exorbitant prices and poor deliveries.

Before the war this company received from Austria all of its magnesia tar which was used in making crucibles. The inability to obtain this raw material at first presented a serious problem, as the Austrian magnesite contained a small percentage of iron which was lacking in other magnesite. After months of experimenting it was found possible to use domestic or Grecian magnesite, and the requisite amount of iron was later introduced. The crucible thus obtained has been found to be very satisfactory. Formerly crucibles for rail welding could be made that would average twenty to thirty-five reactions. The crucibles which are being manufactured at present will approximate that number, although the first crucibles made from magnesite without iron burned out completely in from ten to fifteen reactions.

With the crucible proposition out of the way we set ourselves to the problem of reducing costs to the customer in spite of a steady increase in the prices paid by us for raw materials. One way to accomplish this, and which occurred to us first, was to devise a method by which a given quantity of thermit could be made to produce more superheated steel for the welding operation. We have always mixed a certain proportion of mild steel punchings with the thermit. These are melted down to increase the amount of steel, but it is considered inexpedient to add more than 15 per cent for fear of cooling the thermit reaction too much. What we have now done is to devise a method of preheating steel which is to be combined with the thermit instead of pouring it into the thermit cold. Much less heat is then required and a proportionate amount of thermit is thus saved without decreasing the temperature of the thermit or the efficiency of the joint. The results have been very satisfactory, for in spite of market and labor conditions, the price of thermit-welded joints, including new steel inserts, has been reduced instead of being increased several times, as is the case with most products.

RAILWAYS DO THEIR OWN WELDING

Up to a few years ago electric railway companies were in the habit of contracting for the welding of their rail joints, and in fact some of this welding by other processes is still done on that basis because of the expensive apparatus which has to be used. We have found, however, that we can save the railway companies a great deal of money by teaching them to do the welding themselves. Where the welding was done by contract it necessitated our keeping a large force of trained men so as to be able to take care of our customers' requirements at the times when the welding had to be done. As very little of this welding in the Northern cities is done in the winter time, the company was put to great expense in carrying these men over the slack period. It was not good policy to let these men go, as we would then have to train a force of green men each year. Carrying them over, however, resulted in a large overhead expense which, of course, had to be taken care of in the price charged for the rail welding.

We decided to make an effort to induce some of our customers to do their own welding, in which case we supply only one supervisor to assist them in organizing the work at the start. The results not only reacted to our benefit but very greatly to the benefit of the customer, who was able to do the welding with his own track force and without penalty for delays due to inclement weather, slow track or anything else. If anything happened to hold up the welding there was plenty of other work for the track men to do. As a result the customer saved the large overhead expense and the charge for contractors' labor and was able to do the welding whenever and wherever he pleased.

Practically all our customers now purchase the equipment and we supply without charge a competent superintendent at the start to organize the work and see that the welding gang is properly trained. These superintendents are then at liberty to travel from one city to another keeping an eye on the work and from time to time giving the customer the benefit of any advice that might be needed. Under this system a constant improvement in results has been noticed, and customers are welding from thirty-five to forty joints in a ten-hour day with a track gang of nine men. Some of the companies who are doing rail welding in this way are the San Antonio Street Railway, the Northern Texas Traction Company, the Mahoning & Shenango Railway & Light Company, the Pittsburgh Railways, Oklahoma City Railway and Third Avenue Railway of New York.

Big Demand for Field Coil Linen Tape

Surplus Stock, Usually on Hand in the Spring, Exhausted—Promises for Deliveries Being Met Substantially

By A. A. TUCKER
Secretary Hope Webbing Company, Providence, R. I.

Deliveries on large orders for cotton and linen tape for insulating wire used in motors and generators can now be made in about six months. Up to and including one year ago an order of this kind could be filled out of stock or at least within thirty days, providing the order called for regular sizes. All orders received by this company are being delivered substantially as promised. At the present time the demand for this company's products, which, in addition to the above, includes braided sleeving for motor leads and leads from coils, is from two to three times what it was two years ago in spite of the fact that the production has been increased 100 per cent during that period.

In 1914 this company was manufacturing 50 per cent more than the demand and was thus piling up excess stock, which no doubt accounted for the excellent deliveries made during that period. We are now making 50 per cent less than the demand and, in addition, our stock is being decreased to a minimum. Raw materials have gone up in excess of 100 per cent. Cotton warp which formerly cost 18½ cents is now quoted at 48. The mills from which the raw stocks are obtained are sold ahead until the first of January. It has been necessary to order raw materials many months in advance in order to get a steady flow of deliveries through our plant.

Prospects for the next four or five months are that the demand will be steadily increasing and that deliveries may become a little slower on account of the unsettled conditions of the raw materials market. Maintenance orders for large railways are practically the same as in former years, there being a very slight falling off in the amounts ordered. The biggest orders that have been placed recently in the railway field have been for equipment to be used on the electrification of steam roads.

Committees on Cars and Locomotives Named

The Council of National Defense announces the creation of co-operative committees on railway cars and locomotives, to serve with the committee on transportation and communication, of which Daniel Willard, chairman of the advisory commission of the counsel, is chairman. S. M. Vauclain, vice-president of the Baldwin Locomotive Works, is chairman of both co-operative committees. The other members of the two committees are as follows: Co-operative committee on cars: E. F. Carry, president Haskell & Barker Company; Charles S. Gawthrop, vice-president American Car & Foundry Company; Clive Runnels, vice-president The Pullman Company; R. L. Gordon, assistant to president Standard Steel Car Company; A. S. Reeder, vice-president Pressed Steel Car Company; S. T. Bush, president Buckeye Steel Casting Company. Co-operative committee on locomotives: Andrew Fletcher, president American Locomotive Company; H. P. Ayers, vice-president H. K. Porter Locomotive Company; Joel S. Coffin, Lima Locomotive Corporation.

It will be the function of these two committees to assist in solving the problem of increasing the output of cars and locomotives through co-ordination of the efforts of manufacturers and to aid in making as efficient use as possible of existing rolling stock.

Car Manufacturer Makes Economy Suggestion

An executive of one of the electric railway car-building companies makes a pointed suggestion on economy. He says that few passengers on leaving a street or interurban car can describe the finish of the car in which they have just ridden. The general effect of the car interior creates the impression that lasts in the passenger's mind. The passenger does not consider in detail how the effect is obtained.

Applying this to the car-building business, this manufacturer stated that in the ordinary car the door, sash, window posts and other interior finish require about 1000 bd.-ft. of material. The most popular wood for interior finish is mahogany. A substitute for mahogany is stained birch. At this time mahogany costs $350 a thousand feet and birch but $24 a thousand feet. Thus the manufacturer suggests to the master mechanic a possible saving of more than $300 per car, and according to the manufacturer results will about balance so far as service is concerned.

Manufacturers Urged to Expand

Steel Business After War to Form Basis of Future National Prosperity

Charles M. Schwab, chairman of the Bethlehem Steel Corporation, speaking before the World's Congress of Salesmanship at Detroit, Mich., said that the end of the war will find us engaged in world politics, in international trade and in world affairs on the largest possible scale and predicts that of this vast expansion of world effort and energy, the steel business will form the basis just as it has been the basis of our own national development in the past twenty-five years. Mr. Schwab said in part:

"The United States produced 1,000,000 tons of steel in 1880, in 1916 some 40,000,000 tons were produced. The 1917 production will probably be 45,000,000 tons. When the U. S. Steel Corporation was formed, fifteen years ago, the annual steel production of the country was only 12,000,000 tons and many believed we were then at the zenith of the steel business. My own belief is that we are just as far from the zenith to-day as we were in 1901.

"Let me tell you something of the experience of the Bethlehem Steel Company. Last year we entered upon a constructive program involving expenditure for the next few years of about $100,000,000. Many of our friends urged us to go slowly and wait until all costs should be reduced. But we believed that when facilities were needed they ought to be provided, and that a manufacturer should not speculate upon what he might be able to do in the future. He should do it now. That was the largest construction undertaking, I believe, ever entered upon by a single corporation.

"Costs are very much higher now than they were then. They promise to be much higher in the future. But by beginning when we did we were able to greatly increase our facilities, so that they are available now when they are needed in the interests of national defense."

$5,000,000 in Electrical Exports for March

Another record for electrical exports was broken in March, when the value of electrical merchandise shipped abroad was $5,199,163. This is the first time that the monthly exports of electrical goods have passed the five-million-dollar mark. March exports were more than 80 per cent greater in value than March, 1916, exports.

For the first quarter of the current year electrical exports amounted to $13,638,356, in comparison with $8,148,238 for the corresponding period of 1916. Should the volume of business transacted during the first three months of this year be maintained during the remaining nine months, the exports for the year will total up in the neighborhood of $55,000,000.

During the nine months ended March, 1917, the value of electrical exports was $36,992,204, which is but a few million dollars less than the record total for the entire twelve months of 1916; for the nine months ended March, 1916, $21,036,098, and for the nine months ended March, 1915, $13,867,092.

That these figures are not larger than they are is owing entirely to the swamped condition of the American factories. The foreign market for American electrical goods has been almost limitless. Domestic demand and inability to produce more than so much prevented American manufacturers from seeking foreign business as actively as otherwise might have been the case.

New Location of General Electric Offices

The New York offices of the General Electric Company on June 16 will be moved from 30 Church street to the Equitable Building, 120 Broadway. The entire twentieth floor of the building has been especially arranged and furnished for the General Electric Company. For nine years these offices have been located at 30 Church street, where the company had its offices when it outgrew the Edison Building at 44 Broad street. This structure was originally built for the Edison General Electric Company, which, in 1892, was combined with the Thomson-Houston Electric Company to form the General Electric Company.

In the quarter century since the General Electric Company was formed, its business has increased from about $10,000,000 in gross sales the first year of its organization to gross orders of $167,169,000 during the twenty-fifth year, and its sales offices have naturally increased in number and in importance. The company's offices in New York are the largest and most important among its district offices.

Copper Output in 1916

According to the United States Geological Survey, the smelter production of primary copper in the United States in 1916 was 1,928,000,000 lb., compared with 1,388,000,000 lb. in 1915, an increase of 39 per cent. The total value of the output in 1916 at an average price of 24.6 cents a pound is $474,288,000, compared with $242.900,000 for 1915. The total production of new refined copper in 1916 was 2,259,000,000 lb., an increase of 625,000,000 lb. from the output in 1915. Of the 1916 output of primary copper, 1, 579,620,513 lb., was electrolytic; 269,794,531 lb. Lake copper; 12,469,050 lb. casting copper and 26,868,105 lb. was pig copper. The foreign electrolytic amounted to 370,635,105 lb. The apparent consumption of refined new copper in the United States in 1916 was 1,429,755,266 lb. In 1915 it was 1,043,461,982 lb. If to the 1,429,755,266 lb. of new refined copper is added the 594,423,807 lb. of secondary copper and copper in alloys produced during the year, it is found that a total of about 2,024,000,000 lb. of new and old copper was available for domestic consumption.

NEW YORK METAL MARKET PRICES

	May 3	June 16
Prime Lake, cents per lb	31	32½
Electrolytic, cents per lb	31	32½
Copper wire base, cents per lb	36	36
Lead, cents per lb	9⅞	11⅞
Nickel, cents per lb	50	50
Spelter, cents per lb	9½	9¾
Tin, Straits, cents per lb	58½	60⅝
Aluminum, 98 to 99 per cent, cents per lb	60	61

OLD METAL PRICES

	May 3	June 16
Heavy copper, cents per lb	24½	28
Light copper, cents per lb	21½	25½
Red brass, cents per lb	18½	17½
Yellow brass, cents per lb	17½	18
Lead, heavy, cents per lb	7¾	8¾
Zinc, cents per lb	7	7
Steel car axles, Chicago, per net ton	$41.50	$48.00
Iron car wheels, Chicago, per gross ton	$24.00	$36.00
Steel rail (scrap), Chicago, per gross ton	$31.50	$39.50
Steel rail (relaying), Chicago, per gross ton	$39.00	$42.50
Machine shop turnings, Chicago, per net ton	$11.00	$18.00

CURRENT PRICES FOR MATERIALS

	May 3	June 16
Rubber-covered wire base, New York, cents per lb.	36½	36½
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable stranded, New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40.00	$40.00
Rails, heavy Bessemer, Pittsburgh, per gross ton.	$38.00	$38.00
Wire nails, Pittsburgh, per 100 lb	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb	$3.85	$4.00
Steel bars, Pittsburgh, per 100 lb	$4.00	$4.40
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$6.35	$7.35
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$7.55	$9.05
I-beams over 15-in., Pittsburgh, cents per lb	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$4.15	$4.15
Cement (carload lots), New York, per bbl	$2.12	$2.40
Cement (carload lots), Chicago, per bbl	$2.16	$2.31
Cement (carload lots), Seattle, per bbl	$2.60	$2.60
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.21	$1.21
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.22	$1.22
White lead (100 lb. keg), New York, cents per lb.	10¾	12¼
Turpentine (bbl. lots), New York, cents per gal.	52	44

ROLLING STOCK

Indianapolis, Columbus & Southern Traction Company, Columbus, Ind., is in the market for one new 60-ft. all-steel freight car.

Columbia (S. C.) Railway, Gas & Electric Company has ordered four city cars with maximum traction trucks and four extra sets of trucks from the St. Louis Car Company.

Grand Rapids (Mich.) Street Railway has specified the following details on fifteen 33-ft. vestibule, single-end, pay-within city cars being built for it by the St. Louis Car Company:

Number	15
Name	Grand Rapids Street Railway
Builder	St. Louis Car
Type	Single-end city car
Seating capacity	48
Weight (total)	43,000 lb.
Truck centers, length	19 ft. 6 in.
Length over bumpers	46 ft. 4 in.
Length over corner posts	33 ft. 0 in.
Length over vestibule	45 ft. 4 in.
Width over posts	8 ft. 2 in.
Sill to trolley base	8 ft. 5½ in.
Floor to ceiling	7 ft. 6 in.
Body	Steel with wooden superstructure
Interior trim	Solid mahogany
Headlining	3/16 in. Agasote
Roof	Turtle deck
Air brakes	Westinghouse
Bumpers	Rico anti-climbers
Car trimmings	Bronze
Conduits	St. Louis Car
Control, type	GE K-34
Couplers	Tomlinson, Ohio Brass
Curtain fixtures	Forsyth No. 88
Curtain material	Pantasote N-3
Designation signs	Illuminated E. S. S. Co. mechanism
Door mechanism	Hand operated. St. Louis Car
Fenders	Railway company's design
Gongs	12-in. bronze pneumatic
Hand straps	Rico sanitary
Hand brakes	Dayton drop handle, ratchet drum and Ackley staff
Heaters	Peter Smith No. 2-P
Headlights	Crouse-Hinds
Motors	Four GE 203 outside hung
Paint	Murphy ABC.
Registers	International R-S
Sand-box	With Reliance sand trap valve
Sash fixtures	O. M. Edwards
Seats, style	2 longitudinal 16 cross, Hale & Kilburn
Seating material	Rattan
Springs	Pittsburgh Steel Spring
Step treads	Mason safety-tread
Trucks, type	Standard 0-50-0
Ventilators	Automatic
Wheels	33 in. cast iron
Special devices	Faraday buzzers, Perry side bearings

Oklahoma Union Railway, Tulsa, Okla., through I. F. Crowe, is in the market for an electric locomotive to handle 400-ton freight trains, also for 70-lb. or heavier A. S. C. E. rail.

Westside Electric Street Railway, Charleroi, Pa., is in the market for a 40-ton to 50-ton electric locomotive, and also for 125 tons of 70-lb. to 80-lb. T-rail, either new or re-rolled.

Northern Ohio Traction & Light Company, Akron, Ohio, lost three cars which were destroyed in a fire at the Worcester Avenue carhouse. The loss is estimated at $30,000 and is fully covered by insurance.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, noted in the March 31 issue as ordering thirteen city and seven interurban cars from the G. C. Kuhlman Company, has specified the following details for the city cars:

Number of cars ordered	13
Date order was placed	March 21, 1917
Date of delivery	July 15, 1917
Builder	G. C. Kuhlman Co.
Type	"Peter Witt"
Seating capacity	53
Weight, car body	19,800 lb.
Bolster centers, length	25 ft. 0 in.
Length over bumpers	47 ft. 7 in.
Length over vestibule	46 ft. 7 in.
Width over all	8 ft. 2 in.
Rail to trolley base	10 ft. 7 5/16 in.
Body	Semi-steel
Interior trim	Bronze
Headlining	Agasote
Roof	Arch
Air brakes	GE.
Axles	Brill
Bumpers	Kuhlman
Car trimmings	Kuhlman
Conduits and junction boxes	Westinghouse
Control, type	H-L
Couplers	Tomlinson
Curtain fixtures	Rex
Curtain material	No curtains
Designation signs	Electric Service Supply
Door mechanism	Nat'l Pneumatic
Fare boxes	Furnished by railway
Fenders	Railway Co.'s standard
Gears and pinions	GE.
Hand brakes	Peacock McWhorter
Heaters	Peter Smith
Headlights	Electric Service Supply
Journal boxes	SR-95, No. 19535 Brill
Lightning arresters	Westinghouse
Motors	GE.-247-A inside hung
Paint	St. Louis Car Surfacer Co.
Registers	Furnished by railway
Sanders	Ohio Brass
Sash fixtures	Brill Renitent Post
Seats, style	Brill stationary transverse, longitudinal seats in rear
Seating material	Cherry slat
Springs	Brill
Step treads	Abrasive Materials Co.
Trolley	Knutson No. 5
Trolley base	U. S.
Trolley wheels	U. S.
Trucks, type	Brill 77-E-1
Ventilators	Railway Utility Co.
Wheels	26-in. rolled steel

TRADE NOTES

Robert H. Patchen has resigned as secretary of the National Foreign Trade Council to become affiliated with W. R. Grace & Company. He is succeeded by O. K. Davis.

C. A. Newman, formerly manager of sales promotion for Henion & Hubbel, has been made sales manager of the Boiler-Kote Company with offices in the Fisher Building, Chicago.

Westinghouse Lamp Company, New York, N. Y., announces the removal of its New York district sales offices from 200 Fifth Avenue to Rooms 2021-2023 at 165 Broadway, New York City.

W. L. Garland, sales representative of the Safety Car Heating & Lighting Company, Philadelphia, Pa., has been appointed representative of the Vapor Car Heating Company, Inc., effective June 1.

James H. Slawson has been elected vice-president of the Joliet Railway Supply Company, with headquarters at Chicago. Mr. Slawson was formerly sales agent of the National Malleable Castings Company, Chicago, Ill.

D. H. Thomson has been elected president and treasurer of the Terry Steam Turbine Company, Hartford, Conn., filling the vacancy caused by the death of James Terry. N. L. Snow, sales manager of the company, has been elected vice-president.

Niles Car Manufacturing Company, Youngstown, Ohio, is testing out a self-propelled interurban car, having gas-electric drive with kerosene oil engine. It is reported that this car is being given a thorough tryout on a road in the State of Tennessee.

Robert Abbott, who for the last eight years has been connected with the sales organization of the Bryant Electric Company and has managed its New York office since it was opened in 1913, sailed for France last week to join the Roosevelt Hospital Unit.

Charles H. McCormick, for a number of years connected with the Standard Heat & Ventilation Company, has been appointed special sales agent for the National Railway Appliance Company, 50 East Forty-second Street, New York City.

Blaw Steel Construction Company, Pittsburgh, Pa., announces the appointment of G. E. Land as advertising manager, effective June 1. Mr. Land has recently been connected with the advertising department of the National Tube Company.

Dunn Wire-Cut Lug Brick Company, Conneaut, Ohio, announces that the Brick, Terra Cotta & Tile Company, Corning, N. Y., of which M. E. Gregory is proprietor, has become a licensee and will engage in the manufacture of wire-cut lug paving brick.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., at its annual meeting held on June 13, ratified the agreement for the merger with the Westinghouse Machine Company. Several amendments to the by-laws were adopted and the retiring directors were re-elected.

Arthur M. Torrey, formerly with W. S. Barstow & Company, Inc., has left that organization to re-enter the employ of Hildreth & Company, inspection engineers, 15 Broad Street, New York City, with which firm he was connected for several years prior to joining the Barstow force.

Ernest F. Learned, formerly with the engineering department of Stone & Webster, has joined the staff of the Day Baker Motor Truck Company, Boston, Mass., as head of the industrial electric truck department. He will handle the C. W. Hunt Company's electric trucks and power plant coal-handling equipment.

Henry S. Moos has been appointed director of sales by the American Machinery Syndicate through its New York office and through its sales organization in Barcelona, Madrid, Cartagena, Valencia, and other Spanish cities. Business of the Sociedad General de Representationes—New York, for whom Mr. Moos acted formerly, is continued under the name of the American Machinery Syndicate.

F. Quattrone, who until last September represented the Italian State Railways in New York, has returned to the United States as a special delegate of the Italian government as well as of the Italian State Railways and will be attached to the Italian Embassy at Washington. He will have charge of the purchase and shipment of all materials to be contracted for by the Italian government.

Harrison, Inc., Philadelphia, Pa., which was recently purchased by the DuPont interests, has arranged to take over the property of the Beckton Chemical Company of Newark and Philadelphia and of Candy, Clark & Company of Newark. The company has now obtained plants manufacturing color for paints, paper, ink., etc., and other chemicals necessary to the paint business. The price paid is estimated at $2,000,000.

J. E. Inckel, the technical chief of the Dutch Colonial Department, is coming to New York City from Amsterdam, Holland. He will enlarge the activities of the Dutch Colonial Purchasing Bureau, which in the past year, the first of its existence, has placed $3,000,000 worth of orders in America for railway rolling stock, rails and electrical machinery. It is expected that these figures will be doubled within the next year.

C. W. Chestnut, who for the last two and one-half years has been sales manager of the Western Electric Company at Omaha, Neb., was recently transferred to the Seattle office of the company. He will hold the same position at Seattle and will have supervision of both the Portland and Seattle branches. The position of sales manager in Seattle heretofore has been held by J. I. Colwell in connection with his duties as manager. Mr. Colwell will continue as manager of the Seattle office.

A. H. Sisson has resigned as president of the Southern Car Company, High Point, N. C., and in the future will be associated with the National Pneumatic Company. Mr. Sisson has been connected with the car building business for many years and his wide experience will now be employed in furthering the sale of a product which has now become a very important factor in electric railway car design. The National Pneumatic Company has a well-equipped plant in Chicago for the manufacture of pneumatic and manual door operating devices and other specialties pertaining thereto.

Lincoln Bonding Company, Cleveland, Ohio, reports that less than a year ago the company placed on the market an arc-weld bonding machine which applies the bonds to the rail by the process of reversing the current flow so as to make the rail positive and the carbon electrode negative, and since that time has sold upward of twenty-five machines. During the year twenty of the larger companies in this country have adopted the use of the Lincoln bond as standard, and the experience which these companies have had with the machine and the bond indicates that the system has met with very satisfactory results. This has led the company to believe that the demand for electric-welded bonds during 1917 will be 200 per cent or more greater than that during 1916. The system has also been adopted in a few foreign countries, and a substantial number of bonds are being exported.

General Electric Company, Schenectady, N. Y., announces that "Liberty Loan Day" at the various plants resulted in the sale of $2,955,550 worth of Liberty bonds. The Schenectady works, with 22,000 employees, the largest plant and the company's main office, leads with the surprising total of $1,055,700. The Lynn, Mass., plant is second with $577,450; the Pittsfield works are third with $282,550, and the National Lamp Works are fourth with $253,600. The company had previously announced the purchase of $5,000,000 of the Liberty Loan bonds and that it would buy bonds to any amount and allow its employees to pay for them on a liberal installment plan. A large number took advantage of this plan to buy bonds. In a number of departments every employee subscribed for a bond. The sale among workmen of foreign extraction was truly astonishing, particularly among the Italian and Polish employees.

NEW ADVERTISING LITERATURE

Flood City Manufacturing Company, Johnstown, Pa.—A bulletin on brass and bronze bearings, electric equipment, trolley line material, repair parts, etc.

Ohmer Fare Register Company, Dayton, Ohio.—A bulletin entitled "Enlist," explaining the necessity of enlisting in the training camp for efficient business service.

Stow Manufacturing Company, Binghamton, N. Y.—A pamphlet, "The Tool of the Hour—Stow," on this company's flexible shaft grinder.

Boiler-Kote Company, Chicago, Ill.—Bulletin on "Steam Boilers and How to Rid Them of Scale," descriptive and illustrative of the applications of this product to boilers.

Laclede-Christy Clay Products Company, St. Louis, Mo.—A bulletin "How Can I Offset the Increased Cost of Coal," by the use of the Laclede-Christy chain-grate stokers.

Templeton, Kenly & Company, Ltd., Chicago, Ill.—A pamphlet illustrating the number 318 Simplex pole jack. This pamphlet contains a partial list of users of this jack and a facsimile of a number of testimonial letters.

New Publications

Belt Shifters and Shippers. The fifth in the series of safe practices pamphlets. National Safety Council, Chicago, Ill., price 10 cents.

Public Utility Rates. By Harry Barker, Associate Editor *Engineering News-Record*. McGraw-Hill Book Company, New York, N. Y. 387 pages. Cloth, $4 net, postpaid.

The review of essential facts and principles of rate making contained in this book should be valuable for public authorities, engineers, company officials and others interested in public utility rate regulations. Leaving behind the mass of obscuring detail which is found in individual cases, the author has pointed out clearly the various fundamentals involved in determining the proper charges for water, gas, electricity, communication and transportation. Enough of history and technology is given in each case to enable the layman reader to understand the problems peculiar to each class of utility. To almost any man a study of the book would prove broadening.

Electric Railway Journal

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Consolidation of Street Railway Journal and Electric Railway Review

Vol. XLIX NEW YORK, SATURDAY, JUNE 23, 1917 Number 25

"CO-OPERATING" WITH THE COMMISSION

When Mayor Mitchel instructed the corporation counsel of New York City "strenuously and constantly to oppose the requests of the street railways unless and until they show that the need for increased rates is imperative and permanent," we did not suppose that the city would object to a fair hearing on the companies' petitions. Yet that is exactly the attitude that has been taken by the city counsel at the opening hearings for the Third Avenue Railway this week. Counsel for the company has asked for nothing except simple justice and has been trying to present facts in a frank and open manner, but the city lawyers have endeavored so to obstruct proceedings with technical objections that the commission has seen fit to remind them that before it if not before the courts evidence is admitted upon the basis of common sense. The point of the whole matter is that the city has approached the case from an *ex parte* point of view. In over-emphasizing its solicitude that no transfer charge be "imposed" upon passengers, the city has forgotten that a rate fixed by the commission as fair and reasonable cannot be an imposition upon the car riders. The commission, we believe, will be just. If New York City objects to justice being done, it is not right for it in using obstructive tactics to say that it is co-operating with the commission. If the city wants to co-operate, it must appreciate the impartial position which the commission occupies in the proceedings.

THE PRESENT STATUS OF THE PAVING TAX

Among the avenues of possible financial relief which are open before electric railways one of the most promising is that leading to amelioration of the paving tax burden. This has been referred to frequently of late in connection with the agitation for higher fares, but much of the reference has been of a general nature. In order that the present status of the matter might be clearly understood the ELECTRIC RAILWAY JOURNAL commissioned R. C. Cram, of the way and structure department of the Brooklyn Rapid Transit Company, to make a study of the facts on a typical property and of the attitude of judicial and regulative bodies toward the facts in general. The result is the article published in this issue. It furnishes a convincing demonstration of the heritage which has come down from horse-car days and of the power which municipalities have in many cases to compel the railways to do paving work not contemplated when the franchises were originally bargained for. At the same time the evidence cited by the author of the article indicates a growing desire on the part of the commissions and courts to be reasonable in demanding the rights technically possessed by the public under the franchises. Each reasonable ruling by a public service commission or a court of justice will tend toward further relief, for precedent is powerful in matters of this kind. It was precedent that loaded the paving burden on the electric railways, the precedent set in horse-car days, and precedent after precedent will mark the progress toward better conditions.

EMPLOYMENT OF WOMEN IS INEVITABLE

We quoted last week words of urgent advice from abroad to the electric railway companies of this country to prepare for the depletion of the supply of men in this country, owing to war conditions. All of the belligerents have found that modern war requires a reduction in the number of men unnecessarily employed in home industries and the substitution, where possible, of women where the work still has to go on. In the opinion of leading electric railway men abroad, this change, with the maintenance of efficient railway service, is the most valuable contribution which our electric railway companies can make in the fight for democracy in which we are engaged. Such a plan does not mean a loss of employment to the present employees. Any change of this kind would have to be made gradually to fit the new employees to their tasks, if women conductors are employed on a large scale. Hence, on most roads, the cessation of the engagement of new men would be sufficient to secure the result sought. But even if a few men should be displaced, there is no danger of unemployment in this country for a long time to come. Any person who loses a job will find two others awaiting him, and he will not have to look for them longer than twenty-four hours. As Secretary of War Baker said recently, the exigencies of the war will require readjustment in a great many trades and industries in this country, but this need cause no apprehension because there is important work for all to do. We hardly believe that there will be any serious difficulty with the men on either union or non-union roads if our traction properties should go on a war basis in the way suggested. As matters stand now they cannot get the labor they require. Their need and that of the nation is great, and the labor leaders have already shown their patriotism in many ways. Moreover, in Great Britain, where unions are strong, the use of women in all sorts of labor where formerly men only were employed is extensive. Nevertheless, we urge all companies to set the facts frankly before both their men and the public, and the present is none too early to begin.

ROBBING PETER TO PAY PAUL

In these columns we have set forth the great possibilities for additional earnings through the solicitation of package and general freight traffic and have urged this course as a means of expanding business beyond the possibilities of the passenger traffic. However, this should not be done to the neglect of the passenger traffic. The latter represents the bread and butter of the electric interurban, so to speak, while the freight traffic might be regarded as a sort of bonus. Hence, any development of freight traffic which acts materially to discourage passengers is not good business. A case has come to our attention recently of a road which apparently does not realize this fact. About two years ago it started to carry package freight on the front ends of its passenger cars. The business was profitable and rapidly increased to a volume beyond the capacity of the front vestibules. Instead of providing additional equipment, the company moved the front bulkheads back into the cars, thus decreasing the passenger space to provide freight space. As no additional cars were put in service, the effect on the passengers has not been good because whenever the cars are crowded the standing passengers feel that they are being deprived of seats because of the freight carried. A better plan would have been to operate separate package cars, if the rules of the company did not permit the passengers to overflow into the baggage compartment when there were no seats in the body of the car, or else to increase the number of cars and explain to the public that owing to the use of combination cars a more frequent service was possible.

COURTESY AND SERVICE

Car men who are slow to realize their duty to serve the public courteously are not likely to meet with favor in the public eye. This was well illustrated in a recent court case in which a patron was being tried for pulling the pole from the wire. He admitted the charge, but entered the defense that the car crew had unjustly refused to open the door for him. The magistrate, seeing the scornful expression on the conductor's face during this testimony, made this statement: "I know the kind. A similar thing happened to me. I stood speechless while the car sped away, and all I got was a broad smile from the conductor."

Although the defendant in this case was held under bail to keep the peace, it is quite evident that the experience of the judge must have placed a severe strain upon his judgment. There are too many electric railway employees like the one who aroused the judge's ire. It is true that a car man almost daily meets circumstances which try his patience with the traveling public, but the employee who is a real asset to his company is the one who can rise superior to the occasion, however disagreeable, and do what he is supposed to do—sell rides.

A great deal has been said lately in electric railway circles about selling service. The idea is as old as this industry, and some of the electric railways have practiced it from their beginning. Too many have not. That is why there is an air of newness about it to some companies. In the steam railway industry—good examples might also be pointed out in the electric railway field—perhaps the most conspicuous example of courtesy or selling service applied daily is the Pennsylvania Railroad. "Pennsylvania Railroad" has come to mean courtesy and service.

Lack of courtesy has often damned an otherwise admirable street railway service. The very monopolistic aspect of such service tends to accentuate lack of courtesy on the part of employees, for as a usual thing there is no escape from it. The feeling of resentment that is engendered may not manifest itself openly, but it is no less potent on that account. Indeed, it is much more disastrous in its far-reaching and lasting effects than an abuse which is flagrant and about which specific complaint can be made.

A great deal of attention is given to the physical and the moral fitness of men applying for positions as car men in electric railway work. The possession of selling ability, however, ought also be required in prospective employees. An inquiry about this at the beginning would make unnecessary much of the corrective work that a number of companies have felt it incumbent upon them to carry out among old men who are admirably fitted in some ways for their duties but who lack the pleasing manner that fills one with a sense of satisfaction in having dealt with them.

SETTLE THE STATUS OF THE MANUFACTURER

As there will be no exhibit this year, an excellent opportunity is afforded for determining the relation of the manufacturers to the conduct of future exhibits—in fact, for reviewing the whole subject of the status of the manufacturers in the American Electric Railway Association. It is only fair to say that the convention arrangement of last year by which the conduct of the exhibit was taken out of the hands of the manufacturers and carried on by the railway association was not entirely satisfactory to the manufacturers as a body, but there was not time to work out any different plan. There is this opportunity now, and it should be utilized to effect a permanent plan of organization.

Two fundamental considerations should be recognized in any arrangement made for the future. One of these is that the association should represent in its membership the entire industry because its primary purpose is to improve the conditions in the industry, and this will be for the benefit of companies and manufacturers alike. Hence, the plan adopted at Chicago of full and equal membership for both manufacturers and railway companies is correct and should be retained. This arrangement will give the association the larger income which it needs, especially at the present time.

The second fundamental consideration in a successful association is that the work within the organization should be divided along natural lines. It must be recognized frankly that while the ultimate aims of both classes of members are the same, that is, to improve the status of the industry, their immediate aims are radically different. The function of the railways is to sell transportation to the public at a reasonable profit; that of the manufacturers is to sell equipment to the railways, also at a reasonable profit. Hence, within the association, the part of the work which relates to transportation questions and the relations of the railway with the public should be undertaken primarily by railway members, while that relating to the sale of equipment should devolve upon the manufacturing members.

This division, if accepted, is controlling in determining the question who will conduct the exhibits. This work is no more a proper function of the railway members than is the solicitation from the manufacturers of advertising in *Aera*. The manufacturers should be the best judges of the way in which their equipment should be offered to the railway members. Past differences of opinion between the railway and manufacturing members have arisen largely because this fact has not been recognized. If the manufacturers take over the conduct of the exhibit, as we believe should be done, the work could well be carried out under the general approval of the association executive committee, on which there should be adequate representation from both the manufacturing and railway sides of the industry.

WHAT IS AHEAD OF THE ELECTRIC RAILWAY INDUSTRY?

The momentum of the movement to make the charges for electric railway service accord more accurately with the cost of giving the service grows apace. Hearings have been held this week before the Public Service Commission for the First District of New York concerning the application to make a charge of 2 cents for transfers. It is expected that the application for 6-cent fare for most of the up-State companies in New York will be filed either at the end of this week or early next week. The movement to secure a similar advance, is, we understand, being considered in Massachusetts, and the same is probably the case in several other states. The reports which are constantly coming in of increasing costs of operation show that economic law is forcing this issue to a crisis, quite as much as the activities of the companies themselves.

The electric railway industry is undoubtedly at the parting of the ways. The old 5-cent fare is doomed. What may come in its place we do not know. Probably a general 6-cent fare is apt to be quite widely adopted. Some modification of the zone system may be worked out where it can be made practicable. Charges for transfers will meet the situation elsewhere. But the conclusion is incontestable that the 5-cent fare as a national institution, regarded as inviolate as the constitution of the United States, cannot much longer hold its sway over the public mind.

A good deal of public opposition is manifest to the changed conditions. Railway rates may be raised, but comparatively few people realize that they are paying railway rates; the actual number of shippers is relatively smaller. Taxes may be constantly going up, yet only a few people realize that they are paying taxes. But everybody pays car fare. A rise of 1 cent in the unit of payment seems something abnormal. There is in fact nothing abnormal about it; it is simply the disturbance of a habit of mind.

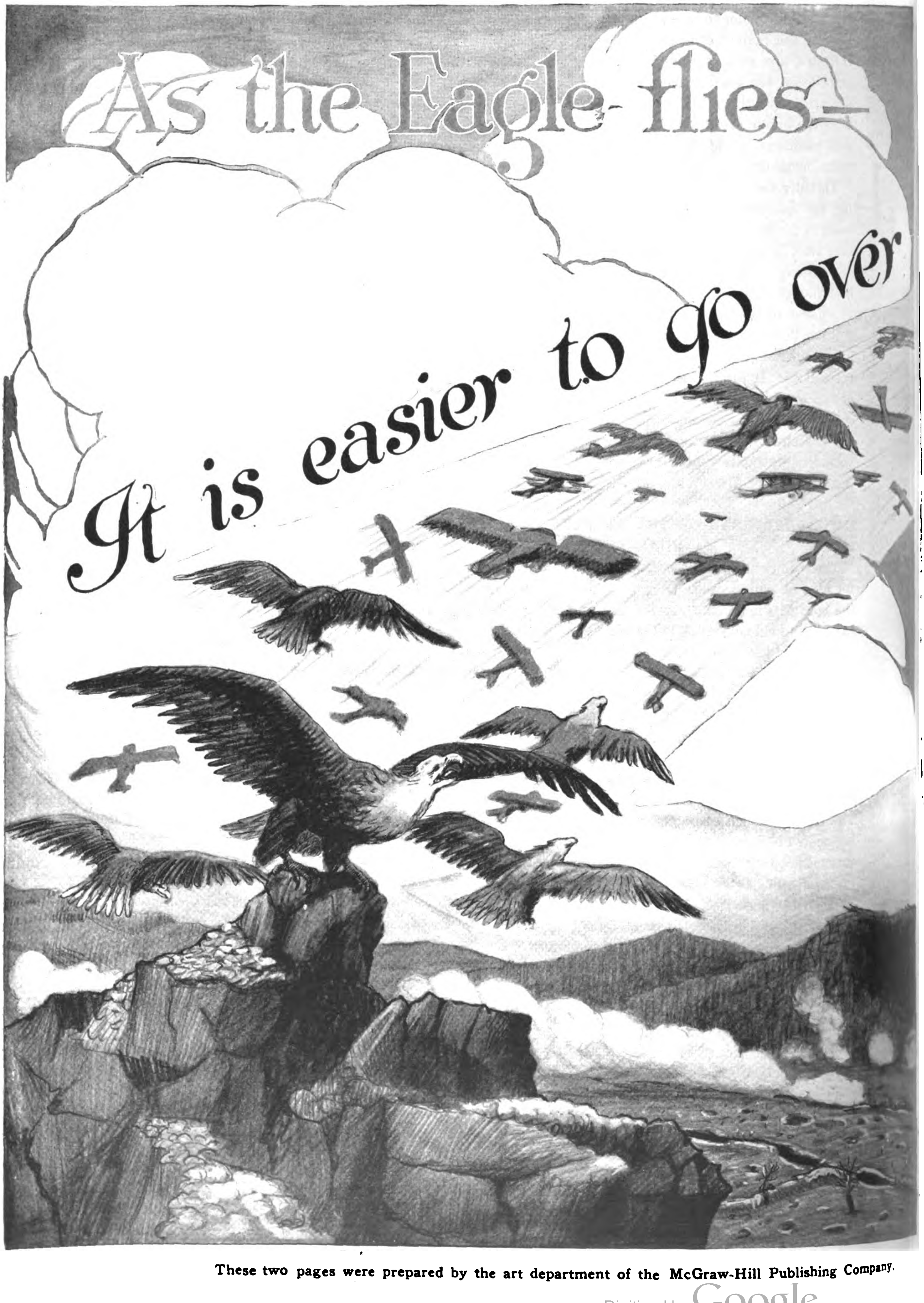
The public must be made to see that electric railway service is a commodity. It is a commodity which should be provided for the public at the lowest possible cost. But the elements which enter into that cost cannot be disregarded. If the public can be served most cheaply through municipal ownership, it is in the public interest that there should be municipal ownership. But if it is, as we believe it to be, a fact that the most economical service can be provided through private operation, it is certainly in the interests of the public to promote efficient private operation. That private operation is subject to a very definite arithmetical equation is set forth in the article on another page showing how the costs of all operation are going up.

Mayor Mitchel of New York has suggested that electric railway companies ought not to add to the other burdens imposed upon the public by the war by adding to the charges for their service. He has intimated that the electric railway companies in New York City are seeking to be exempt from bearing their share of the burdens incident to the war. It is astonishing that such an argument should be made by one so intelligent as Mayor Mitchel. Manufacturing companies of all kinds, merchants, working men, the government itself, have increased their charges for performing the service they render. It is all considered to be regrettable but inevitable. But if companies subject to public utility laws seek to increase their prices to take care of the increasing costs, it is intimated that they are seeking to avoid bearing their share of the burdens of the war!

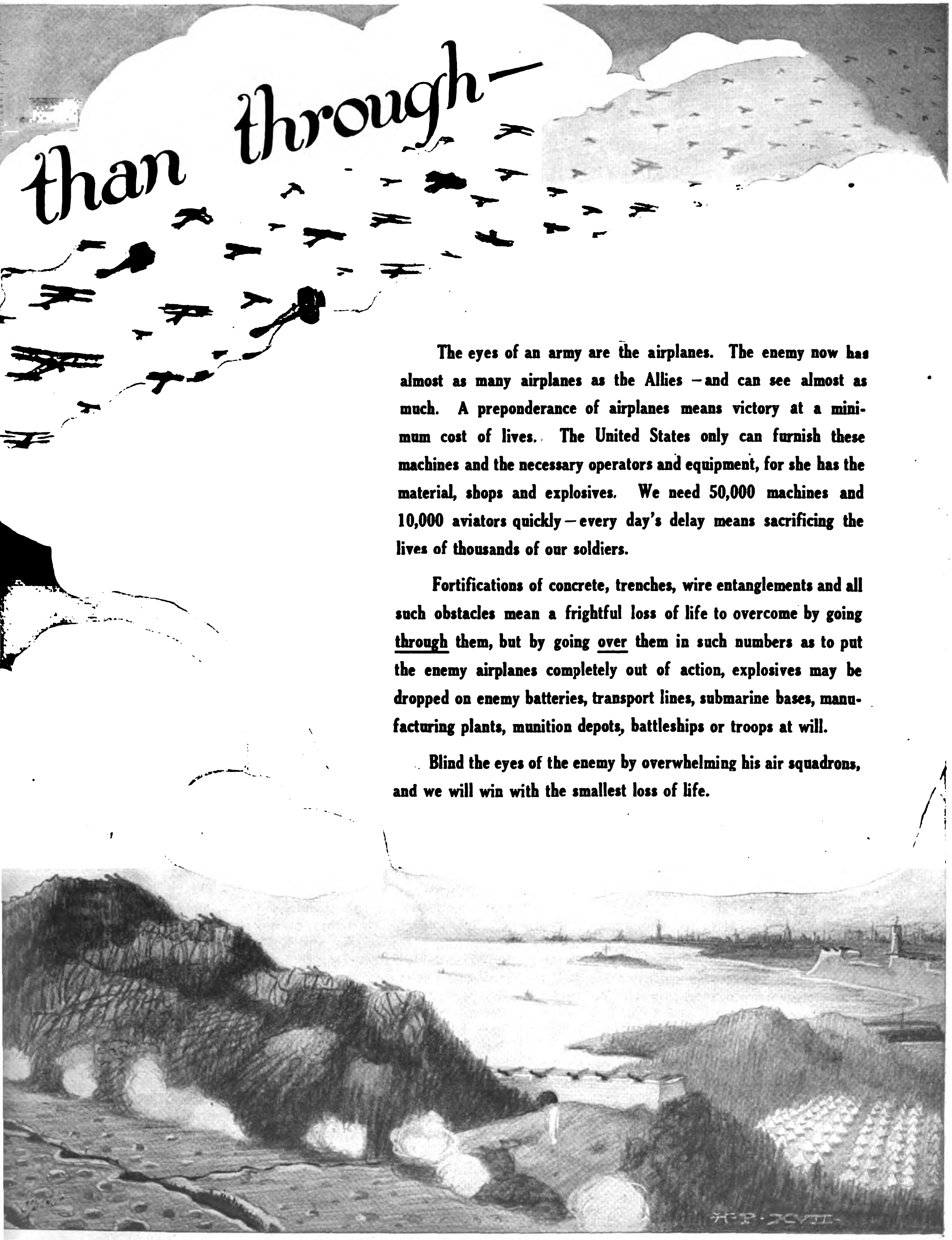
The only reason that any such claim could be put forth at all is that these companies must obtain the sanction of public service commissions to increase their prices. That focuses upon public authority the necessity for making a decision to allow such increases to be made. Any such decision is bound to be unpopular, no matter how justified it may be. Public officers are selected by votes—by popular votes. And on the eve of a campaign the temptation to make political capital seems too great to resist.

But we hold firm to the faith that the people are perfectly fair and that politicians who appeal for popular applause by imposing unjust burdens upon public utility companies are but sowing the wind against the inevitable whirlwind of public disfavor. The people sooner or later will realize the truth, and the public officer who shows courage and follows his honest convictions, rather than makes a specious appeal to the fleeting popularity of the multitude, will in the long run secure and hold public confidence.

We are therefore among those who believe that out of the vast mass of conflicting currents which are now sweeping over our national life, there will ultimately emerge a tidal wave of common sense and sanity of view which will once more restore to our people the sound foundations of economic law upon which alone a permanent edifice of national prosperity can be built. And upon that foundation we expect to see erected a constructive treatment of the electric railway problem.


As the Eagle flies—
It is easier to go over

These two pages were prepared by the art department of the McGraw-Hill Publishing Company.



The eyes of an army are the airplanes. The enemy now has almost as many airplanes as the Allies —and can see almost as much. A preponderance of airplanes means victory at a minimum cost of lives. The United States only can furnish these machines and the necessary operators and equipment, for she has the material, shops and explosives. We need 50,000 machines and 10,000 aviators quickly—every day's delay means sacrificing the lives of thousands of our soldiers.

Fortifications of concrete, trenches, wire entanglements and all such obstacles mean a frightful loss of life to overcome by going through them, but by going over them in such numbers as to put the enemy airplanes completely out of action, explosives may be dropped on enemy batteries, transport lines, submarine bases, manufacturing plants, munition depots, battleships or troops at will.

Blind the eyes of the enemy by overwhelming his air squadrons, and we will win with the smallest loss of life.

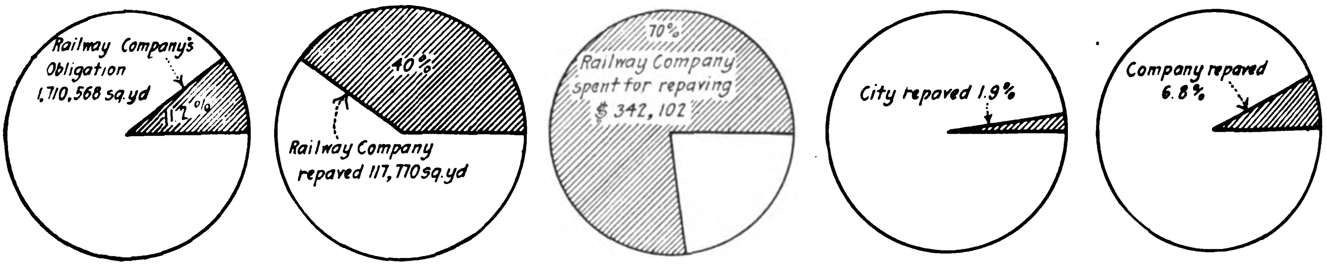
Inc., to illustrate the editorial in our last issue on "Air Supremacy Cheap at Half-a-Billion."

What Shall We Do With the Paving Burden?

The Author Sums Up the Repaving Situation and Summons Authorities to Prove the Injustice of the Historic but Outgrown Tax—He Cites Some Convincing Data from Brooklyn

By R. C. CRAM
Assistant Engineer Way and Structure Department, Brooklyn Rapid Transit System

THE object of this article is threefold: (1) To call attention to the ever-increasing importance of the pavement as an item now considered a part of track maintenance and construction costs. (2) To develop interest in the means for securing a more equitable adjustment of the track pavement burden between the municipalities and the street railways. (3) To suggest revision of the classification of accounts so that the track pavement maintenance cost may be more properly considered as a deduction from income under the head of "Taxes" instead of a track maintenance charge under "Operating Expenses." It is believed that the subject is of particular moment at this time, when every effort is being made to "increase the fare," because the contributions of the railways for pavement (even though required by franchises) are rapidly growing and are not generally considered, either by the public or by the railways, as taxes.



Relative paving obligation, complete circle represents 15,332,105 sq. yd.

Relative repaving work, complete circle represents 297,379 sq. yd.

Relative repaving expense, complete circle represents $446,287.

City repaving in per cent of obligation represented by full circle as 100 per cent.

Company repaving in per cent of obligation represented by full circle as 100 per cent.

DIAGRAMS SHOWING RELATIVE QUANTITY AND EXPENSE OF PAVING IN BROOKLYN, N. Y., BY THE RAILWAY COMPANY AND THE MUNICIPALITY

It is necessary to go back to the historical horse-car days to find the reason for the imposition of the track pavement burden upon the street railways. History tells us that when horses furnished the motive power the track pavement was often worn excessively by the constant travel of horses in regular paths between and adjacent to the rails. There was considerable justice in requiring the railways to maintain the pavements under those conditions, but with the advent of motor-operated cars the conditions were immediately changed and the contributory wear of pavement was removed. Nevertheless most of the early operators of electric street railways failed to realize this important fact and continued to seek and accept franchises with pavement burdens attached thereto.

It is also a matter of record that during the horse-car and early electrification periods the track pavements were usually composed of cobble or macadam, costing from 50 cents to 70 cents per square yard. In contrast we now have track pavements of granite, wood or brick costing $2.80 to $3.50 per square yard, representing an increase of from 500 to 700 per cent. In other words, the present situation is one wherein we now have a vastly increased pavement cost with no contributory wear in contrast with the former condition of a considerable contributory wear with a comparatively small pavement cost.

Data on the Extent of the Burden

In order to determine the correctness of the impression that the railway company's share in maintenance of city pavements is larger than is ordinarily supposed, the writer recently had a study made of the widths between curbs on streets occupied by tracks in Brooklyn. It was found that there were tracks in some 200 different streets, and computations for 100 streets indicated that the average width between curbs is 39½ ft., and that the pavement areas maintained by the railway and the city amount to 48 per cent and 52 per cent respectively.

In a number of streets in the older sections of the city the railway area reached 61 per cent. The railway area was computed on the standard track centers of 9 ft., 8½ in., and the statutory obligation to pave "between the rails of the tracks and 2 ft. outside thereof." It is particularly interesting to note that, while the railway maintains areas substantially equal to city areas in these streets, traffic counts as reported by the way committee on way matters in the 1915 *Proceedings* of the American Electric Railway Engineering Association show that "from 50 per cent to 90 per cent of the vehicular traffic comes upon the railway pavement area in many streets."

The argument might be advanced that this fact would indicate excessive wear of pavement due to tracks in streets and such wear should be a burden upon the street railways. It is observed, however, that in any streets of similar widths the simple factor of the parking of automobiles forces the normal stream of traffic to the center of the street and that this occurs on streets without tracks. The tracks themselves, when consisting of tram or groove girder rails, take excessive wear from the street pavement; in fact, in Chicago it has been found that rails in streets upon which no cars have ever run are wearing out just as fast as though there was car traffic upon them, and this wear is solely due to wagon traffic. It is a fair question to ask what would happen to the pavement if it alone had to withstand wear of this character.

A comparison of the Brooklyn Rapid Transit Company's total paving obligation with that of the city discloses a number of rather surprising features, as indicated in the tables reproduced herewith, which were compiled from the records of the Bureau of Highways of Brooklyn. The figures and percentages obtained are naturally subject to various interpretations and the following explanation may not be out of place.

TABLE NO. 1—COMPARISON OF TOTAL PAVED AREAS

Year	City, Sq. Yd.	Railway Co., Sq. Yd.	Per Cent of City Area
1913	13,701,592	1,646,434	12.0
1914	14,341,273	1,699,098	11.8
1915	15,332,105	1,710,568	11.2

The tables do not include any expense or yardage for regular or "ordinary" miscellaneous paving repairs scattered about the city. This is indicated by the word "repaved," under which all areas repaved in toto, either by the city or the railway, because of wear and track conditions, are included. It must be borne in mind that the railway company's repaved area cannot bear the same relation to its total obligation area as does the city's because it is almost impossible to determine how much of the railway area required repaving because of defects and wear alone, while much of the city's area is repaved (at least on streets having no tracks) because of defects and wear only. However, a certain proportion of city repavement on track streets is at least partly required by adjustments in cross-section due to revised track grades given by the city. Even so, the railway company's expenditure is much higher in cost per square yard than the city's expenditure, due largely to the use in the main of granite on concrete by the railway and of sheet asphalt by the city. The latter can thus secure a greater repavement area for an expense equal to that of the railway. Attention is directed to the tables and graphs which indicate more clearly the relations between the railroad pavements and the city pavements and the following explanations thereof should be of interest.

SOME COMMENTS ON THE TABULATED DATA

Table No. 1 is a three-year comparison of the total paved areas installed by the city and the railway company respectively to the end of the calendar year 1915. It will be noted that the railway company's obligation area ranges from 11.2 per cent to 12 per cent of the city's area.

Table No. 2 compares the areas repaved annually by the city and the railway company and indicates that the railway repaves areas equivalent to from 25 per cent to 40 per cent of the areas which the city repaves.

TABLE NO. 2—COMPARISON OF TOTAL REPAVED AREAS

Year	City, Sq. Yd.	Railway Co., Sq. Yd.	Per Cent of City Area
1913	661,290	165,058	25
1914	414,357	159,522	39
1915	297,379	117,770	40
	1,373,026	442,350	32 per cent for 3 yrs.

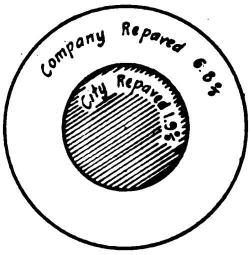
Table No. 3 compares the expenditures of the city and the railway company at Bureau of Highway rates, and brings out the point that the railway's expenditures range from 33 per cent to 77 per cent of the city's expenditure, although the railway's obligation area is only 11.2 per cent to 12 per cent of the city's. This table emphasizes the point that the railway pavements cost more in proportion than the city's, due to the general use of more costly pavements by the railway company. It is only fair to state in connection with the figures for 1915, that the highway bureau was hampered by lack of funds for pavement work until very late in the year, which greatly reduced the amount of work which could be accomplished that year.

Table No. 4 compares the relations of the repaved areas to the total paved areas maintained by the city and the railway and shows the striking fact that the railway repaves very much more of its area annually than does the city, in proportion to the respective obligations, even though the railway's expense is also greater for equivalent areas.

TABLE NO. 3—COMPARISON OF TOTAL REPAVEMENT EXPENSE

Year	City	Railway Co.	Per Cent of City Expense
1913	$1,505,515	$498,220	33
1914	1,046,828	495,655	47
1915	446,287	344,102	77

The magnitude of the railway's paving obligation is more fully realized when expressed in terms other than yardage alone. The Brooklyn Rapid Transit System maintains approximately 2,640,000 sq. yd. of pavement in the Boroughs of Brooklyn and Queens, which at an average cost of $2.50 per square yard would have a value of $6,600,000. Ultimately the above area, if all paved with granite on concrete, would have an estimated value of over $9,000,000. The foregoing yardage is equivalent to that required for a state highway 18 ft. wide and 250 miles long, or for a 30-ft. street 150 miles long—enough for a fair-sized city. It has been stated that the pavement investment in tracks in Chicago up to the end of 1914 represented an investment of $7,373,683. These figures represent original investments, but we have also to consider repavement charges. In the Borough of Brooklyn alone, the railway company expends from $350,000 to $500,000 annually for repavement, with an additional sum ranging from $50,000 to $70,000 yearly for miscellaneous pavement repairs.



CITY AND COMPANY REPAVING COMPARED

The Connecticut Company recently filed a brief with the Public Utilities Commission of Connecticut wherein the statement is made that the company has expended an average of $400,000 per year on pavements for the last three years. Furthermore it appears that from 30 per cent to 40 per cent of track maintenance charges are for pavement, while about 50 per cent of the new construction expense goes to the pavement account. Such figures, combined with the rapidly in-

TABLE NO. 4*—COMPARISON OF RELATION OF REPAVED AREAS TO TOTAL PAVED AREAS

	City			Railway Co.		
Year	Total Paved Area, Sq. Yd.	Repaved Area, Sq. Yd.	Per Cent of Total	Total Paved Area, Sq. Yd.	Repaved Area, Sq. Yd.	Per Cent of Total
1913	13,701,592	661,290	4.8	1,646,434	165,058	10.0
1914	14,341,273	414,357	2.9	1,699,098	159,522	9.3
1915	15,332,105	297,379	1.9	1,710,568	117,770	6.8

*From Table No. 4 it will be seen that the railway repaved from two to three and one-half times as much area, proportionately, as did the city, based on the relative obligations.

creasing costs of labor and materials, may well cause us to seek for relief.

PUBLIC OFFICIALS SHOW NEW INTEREST

There is a growing interest on the part of the municipal and state authorities generally in the broad subject of public dealings with public utility corporations. This interest appears more and more to take the form of a real study into the fairness of such dealings as having a direct and vital bearing on the public welfare. The creation of public utility commissions charged with the study of such affairs and the comparatively recent wave of franchise renewal discussions in municipalities in all parts of the country has given the representatives of the people and the public in general a clearer view of the subject. Suspicion is being replaced with confidence gained largely by the open discussions which have all tended to show the fundamental truths underlying public relations. The most important of these is the fact that wrongs inflicted in the name of the public upon corporations supplying vital public utilities always react directly or indirectly upon the people themselves.

"Daylight Ahead" Indicated by These Facts

The author cites various instances of a more reasonable view of the paving burden, such as a commutation in Philadelphia for a stated sum of the former paving obligation, the distinction drawn in the Cleveland ordinance between pavement maintenance (which the company is obliged to do) and repaving (which it is not), the recommendation of the Massachusetts commission in the Bay State case that the companies be required "to meet only the reasonable cost" of such work, and the decision of the Maryland Court of Appeals, upheld by the United States Supreme Court, that there is a difference between repairs and repaving.

One of the earliest indications of the new public viewpoint, which has a particular interest in this discussion of the pavement obligation, is found in the now famous Ordinance of Councils of the City of Philadelphia, dated July 1, 1907, which is an agreement between that city and the Philadelphia Rapid Transit Company in a radical readjustment of many conflicting franchise obligations relating to that company's paving burden. The fourth and sixth paragraphs of the preamble to that agreement recognize that "the terms, conditions, restrictions and liabilities which have been imposed upon these various companies (all of which shall be taken as included in the words 'subsidiary companies' wherever the same are hereinafter used) differ widely, and there is dispute and uncertainty with respect to the effect of many of the provisions thereof, and it is believed that it is to the interest of the public as well as of the parties hereto to supersede the former regulations, and to define and regulate the relations between the parties hereto so as to make them fixed, fair and uniform." Further that "a large sum of money is required to improve, complete and extend the present system of the company in order that it shall better serve the public; and for this purpose it is essential that the position of the company be clearly defined, and the securities of itself and its underlying properties unquestioned, and its right to make extensions in the future assured, in order that it may obtain credit to finance the increased transit facilities so necessary for the welfare of the public and the development of the city."

The said agreement provides, among other things, for the paving, repaving and repairing of railway pavement areas by the city and relieves the company of charges for pavement, snow removal, bridge licenses and other similar burdens and prohibits all further imposition of such burdens upon payment, by the railway, of definite sums of money, beginning with $500,000 and increasing by $50,000 for each term of ten years. The railway, however, must replace or repair pavement removed or damaged by its construction and repair work.

The tenth clause of the agreement proper construes these payments as in the nature of taxes in the following words: "To such extent, however, as taxes and assessments not upon such real estate or dividends may hereafter be imposed upon the company for the benefit of the city, the city shall credit upon the taxes that may thus be hereafter imposed all payments made hereunder as well also as the sums which shall be divided with and paid to the city out of earnings."

From this synopsis of the Philadelphia situation it will be seen that the city recognized certain advantages to be gained from the modernized paving policy in definition of the paving obligation which would tend to better the financial position of the company without harm to the city, and thus assist in the development of transit facilities so essential to the growth of any community. At the same time the city also recognized the fact that franchise pavement burdens must be considered as taxes.

The great importance of defining the amount of the paving tax for a term of years cannot be emphasized too strongly, regardless of the question as to whether or not the particular method above cited would suit the prevailing conditions throughout the country, because most companies to-day do not know nor can they even prophesy as to what sums they will have to pay for the annual pavement tax. It may be $50,000 this year and $250,000 the next, largely subject to orders of public officials, who often have arbitrary and unrestricted powers to require unwarranted expenditures under the broad terms of most railway pavement obligations. Such an unknown quantity of taxation makes it necessary, when considering a fair rate of return on capital, to provide a rate of income which will produce the revenue to pay the highest amount this form of taxation may reach.

Reasons somewhat similar to those which actuated Philadelphia may have been in mind when the famous Cleveland 3-cent fare ordinance was drafted, because it seems evident that it would be practically impossible to forecast a net income which would insure even such a low rate of fare if huge and variable sums were to be expended by the railway for pavement taxes. Section 7 of the Cleveland ordinance is as follows: "The company shall maintain in constant repair the pavement within a space 7 ft. in width for single track and for double track the entire space between the outer rails of both tracks, including the space between the two tracks and 1 ft. outside of each outer rail, but in no event to exceed 18 ft., except about curves, special work and where there are more than two tracks in a street, in all paved streets occupied by its tracks, whether such streets were paved at the time of the passage of this ordinance or subsequently thereto; but the company shall not be required to repave by virtue of this obligation to repair, nor by virtue of any requirement of the general ordinances of the city of Cleveland during the continuance of this grant."

It will be noted that the railway is to maintain the pavement in constant repair in a definite track area, but it is not required to repave by virtue of the repair obligation. This distinction is important, and it is understood that under this section of the ordinance the repavement of track following reconstruction thereof is not held to be a burden upon the company, but it is instead an obligation upon the city. Furthermore, it does not seem to require the installation of pavement by the company in new track extensions. In effect, then, the Philadelphia situation is repeated to the extent that the railway company is only required to maintain existing pavement disturbed by it for track repairs and on account of defects only until the complete repavement becomes necessary.

The Philadelphia idea of fixing a definite sum to be paid to the municipality by the railway company in lieu of its obligation to maintain and repair pavement in tracks was antedated by almost ten years in the State of Massachusetts under an act passed in 1898. This provided that the railway companies were to pay a commutation tax to the State for this purpose, excepting that where local franchise obligations provided for caring of the street surface by the railways, this duty was still to continue.

The following quotation from the fourth annual report of the Public Service Commission of the commonwealth of Massachusetts is very interesting in this connection, and particularly in the statements contained therein to the effect that cities should in their own interest seek to relieve the companies of all unnecessary and unjust burdens:

> In view of the present unsatisfactory financial condition of the street railway companies in general, it is imperative that the cities and towns in which they operate should, in their own interest, seek to relieve the companies from all unjust or unnecessary burdens. The importance of such public co-operation was fully discussed by the commission in its decision in the Bay State rate case and what was then said it is unnecessary now to repeat, except so far as it relates to the question of maintaining and repairing the public streets, where action by the general court is desirable. In regard to this matter the commission said:
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> "In 1898 an act was passed (St. 1898, c. 578) which was clearly intended to relieve street railway companies from the duty, formerly imposed, of maintaining and repairing the street surface within their track locations and to substitute an excise or 'commutation' tax in place of this duty, a tax which the Bay State company now pays. For the year ended June 30, 1914, it amounted to about $210,000. Nevertheless, the investigation in this case of the property accounts and operating expenses of the company has brought to the surface the fact that it has been required, ever since this law was passed, not only to pay the tax, but, with comparatively few exceptions, to do the same work which it was previously required to do.
>
> "The courts have held that the law of 1898 did not in fact exempt companies from the duty of caring for the street surface where that duty was imposed, not by the general statutes, but by provisions in original location grants; but in the many cases throughout this system where the original grants contain no such provisions it develops that the Bay State company has, in effect, been required by various forms of persuasion to continue to do the old work. In securing new locations involved in the laying of double track, or in the reduction of curves or in other respects necessary to the efficient operation of the road, apparently the company has continually been obliged to dicker with the local authorities and finally to agree to perform work upon the streets which the statutes do not require or even contemplate (Record, pp. 4666-4675).
>
> "It is perfectly natural that municipal governments, anxious to keep down the local tax rate by which they are so largely judged, should seek to unload upon the street railway company all possible expense, but such a policy, in the long run, reacts upon the public served. Street railway companies have no mysterious source of revenue, but obtain their funds from the people who ride in their cars. Any burden or tax imposed upon the company these people must ultimately pay. If the tax or burden is unjust it only means, in the final analysis, that a portion of the public is being subjected, by indirection, to an inevitable form of special taxation. Furthermore, the burden is not measured wholly by the cost of the physical work which the company is finally required to do, for the continual dickering over such matters consumes what is, in the aggregate, a very large amount of time and adds materially to the cost of management.
>
> "The importance of this question is shown by the fact that, disregarding such matters as grading, bridge work, etc., the cost of the paving alone, for which the Bay State company has paid since the law of 1898 was enacted and which it has been expected to maintain, is estimated at more than $2,000,000. In a report made to the General Court at its last session, the commission strongly urged that the present system should be changed by eliminating, in effect, the present 'commutation' tax, by placing all paving work squarely in the hands of the municipalities, and by requiring the street railway companies to meet only the reasonable cost of any such work done within their track locations. Whether or not this is the best plan that might be adopted is here immaterial, but at all events it is perfectly clear that the companies ought not to be required to pay the present 'commutation' tax and at the same time do the work for which this tax was supposed to be a substitute."

Brooklyn Paving Data

The area of pavement maintained by the Brooklyn Rapid Transit Company is more than two and a half million square yards which if ultimately paved with granite or concrete, will be worth $9,000,000.

This is equivalent to a state highway 18 ft. wide and 250 miles long, or to a 30-ft. street 150 miles long.

In the Borough of Brooklyn alone the company spends from a third to a half of a million dollars annually on repaving, besides large sums for miscellaneous paving repairs.

There are many phases of the application and effect of the burden imposed by the existing laws which requires railways to repair pavements, and they are well brought out in an article on "Highway Paving by Street Railways," by W. R. Dunham, Jr., in the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 24, 1917. The most important two points made by Mr. Dunham are that the existing state laws covering the subject are very old, dating back to the days of the Civil War, and that their intent was to require pavement repairs but not renewals. He also emphasizes the fact that the present misinterpretations of such old statutes wrongfully impose burdens not warranted by proper application and interpretation of the law.

This last point is important, and actions in the courts in cases of such unwarranted and unlawful interpretations in application of such laws have been decided in favor of railway companies. A typical case of this nature recently reached the United States Supreme Court after having been decided in favor of the United Railways & Electric Company of Baltimore by the Maryland Court of Appeals. In a unanimous decision the Supreme Court upheld the Maryland Court (United Railways Company vs. Baltimore, 127 Md., 660. Baltimore vs. United Railways Company, Supreme Court U. S.—October Term, 1915, Memoranda Cases). The main contentions were upon the interpretations of the word "repair," and the point that repairs could not be construed as repavements. In course of opinion the Maryland Court of Appeals said: "All the grants which have been made to the defendant company since its formation have been made subject to the paving and repairing obligations imposed by the ordinance of 1897, and subject also to the payment of the park tax and other charges fixed by the Board of Estimate under the City Charter. The obligations to pave and repair, where tracks have been laid under that ordinance, have been assumed by the defendant, and it has paid the park tax since its formation, a sum amounting to more than six million seven hundred thousand dollars, and all franchise charges and general taxes and other costs, aggregating large sums, in adapting and adjusting its tracks and paving operations. The defendant is not claiming an exemption from taxation * * *. All of its property is taxed, and it contributes in general taxes to the cost of public improvements and the general welfare of the city large sums of money. It is resisting what it contends to be an unlawful and illegal exaction laid upon it by the act of 1914, Chapter 37."

Another form of unwarranted and improper interpretation of the statute appears in the attempts now being made in New York to construe the word "repair" so as to make it cover the removal and replacement of track pavements in connection with sewer construction and repair undertaken by the municipality. There appears to be an obligation on the part of the railways to remove track structures which may interfere with sewer operations in common with other corporations having sub-surface structures in the streets. It will be seen that it is impossible to remove a paved track without first removing the pavement, involving the destruction of the pavement. But the pavement is not a part of the track, and the railway's duty under the law is only to repair and maintain pavement in its tracks and not wilfully to destroy it for some purpose desired by the municipality. Therefore, if the necessity arises for removal of tracks in such cases it follows that it is the duty of the municipality first to remove the pavement and also to restore the pavement after the track has been replaced. And this duty imposes no hardship on the municipality because it must remove and replace pavements in sewer operations in all streets where there are no tracks. Furthermore there arises the question as to who owns the pavement in the tracks, and P. B. Wittmer, Deputy State Tax Commissioner of the State of New York, in his "Letter to the Editor" appearing in the issue of the JOURNAL for March 10, 1917, says: "The Court having ruled that such investment (in track paving) does not represent tangible property owned by the railroads but is on the contrary the property of the municipality * * *." Hence, if the track pavement is really owned by the municipality it must be its duty to remove it and replace it when necessary for purposes of its own sewer operations.

It is gratifying to know that a case in point has been decided in favor of the railroad companies in a recent decision handed down by Justice Lehman in the Case of the City of New York vs. Whitridge, receiver Third Ave. Railway Co.

EXERCISE OF POWER ARBITRARY

Reference has been made to arbitrary and unrestricted powers conferred on officials to require unwarranted expenditures under the broad terms of most railroad pavement obligations. One instance of what appears to be an attempt to exercise this power unfairly may be cited. A subsidiary of a large street railway corporation operating in New York City has tracks in an outlying street leading to a summer resort. The tracks are over twenty years old and are paved with cobble, a comparatively cheap but serviceable form of pavement which was installed when the line was built. There is and has been nothing but dirt in the street outside the railroad pavement area. There are no proceedings in hand for the construction of pavement in the street by the city. The street and tracks are not at established grade and the tracks will require relocation at such time as the city undertakes to put the street at established lines and grades. Nevertheless the city officials ordered the railroad to repair the cobble track pavement by installing new granite blocks with grouted joints on a concrete foundation in the entire railroad area. Consider the injustice of this so-called "repair" with the foregoing conditions in mind. A pavement costing $3.50 or more per square yard is to replace a cobble pavement. The city hopes to get the use of a first-class pavement 18 ft. wide, about that of a state highway, and it proposes to do nothing itself in its own areas. Needless to say the railroad company is resisting such an arbitrary misuse of powers conferred upon the city officials.

In Connecticut there is a statute which prevents such a misuse of power. Section 3837 of the General Statutes reads in part, as follows: "Such authorities shall not order such company to use any better or more expensive kind of pavement or material for that part of the highway which it is the duty of such company to keep in repair, than is used by the town, city or borough upon the remaining width of the highway, except for a space of one foot on each side of each rail, unless such better or more expensive kind of pavement or material was required in the order permitting the original location of such railway on such highway."

TRACK PAVING IS RAILWAY TAXATION

Mr. Dunham in course of his article says: "To assume that this paving burden is of the nature of a franchise tax is erroneous * * *," and then he proceeds himself to discuss the burden as a tax. Webster says in definition of the word "tax" that it is "a charge, especially a pecuniary burden imposed by authority; a task exacted from one under control." But we do not have to rely solely on the dictionary for affirmation of the correctness of the opinion that the paving burden of the railroad is a tax. It was recognized as such in the Philadelphia ordinance quoted. It has been recognized as such by the State Tax Commission of the State of New York in connection with the taxation of the intangible element of special franchises, as stated by Mr. Wittmer in his letter previously referred to. Attorney B. L. Spahr, in an article on "Taxing Electric Railways" in the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 16, 1916, calls the paving requirement a form of local taxation comprised in requirements in municipal ordinances and says in part: "An annual tax on cars or other property may be imposed as a condition of consent. The usual form, however, is a provision requiring either the paving or repairing of streets, or both." But the courts have also construed the obligation as a tax in the important case of the City of Rochester vs. Rochester Street Railway Company (182 N. Y., 99) in the opinion by Chief Justice Cullen, which says, among other things: "The provision of the General Railroad Law (Laws of 1890, Chapter 565, Section 98) requiring street railroads to pay the cost of paving between their tracks is an exercise of the taxing power of the legislature."

The present standard classification of accounts charges paving to capital under the construction accounts and to operating expense in operating accounts under the general head of "Maintenance of Way & Structures." The question arises as to whether those classifications are correct. In the first place the courts have ruled that investment in pavements does not represent tangible property, and it seems improper to capitalize intangible property. But if the pavement requirement attaches to a franchise and is in the nature of a tax or payment for such franchise it must certainly be allowable to capitalize the cost of the pavement under the head of promotion expense or legal expense as a part of the intangible value of said franchise. In any event the investor and public should know that only about one-half of the total cost of a newly-paved track structure is for the track and that the other half represents the pavement cost which in turn is in reality a heavy tax or payment for the franchise.

Again, if the cost of maintaining pavements which produce no income is a tax it would seem to be improper to charge it to paving under operating expense, because all other taxes are not so charged but instead are placed under the general head of "Deductions from Income: Taxes." It would be better for all concerned to classify the paving maintenance account under the head of "Taxes: Paving Account," thus putting the item squarely into the accounts as a tax, where it more properly belongs.

CONCLUSIONS

The foregoing discussion of paving matters has been presented with the view of bringing out some features of a form of taxation which are not often thought of as such and some conclusions may not be out of place, as follows:

1. Existing statutes requiring pavement construction and repair in tracks are in urgent need of revision so as to render them more in accord with the present conditions.
2. Existing paving ordinances and regulations of municipalities which attach to railroad franchises also need revision. In fact a basis should be found whereby an equitable franchise tax of a fixed form can be substituted for the present inequitable and variable paving obligation.
3. If relief could be obtained from the entire paving burden except for such expense as is caused by constructing new tracks in existing pavements and by repairs or renewals occasioned only by track repair or reconstruction, such relief would greatly assist the railroad companies.
4. The present pavement requirements are unjust to the car rider because he alone pays for pavements which he does not use and his fare now assists in paying other people's taxes in helping to provide pavements for business and pleasure vehicles to use. Such facilities should be paid for by the entire community.
5. Statutory pavement requirements should be considered as franchise taxes and, as such, they should be classified in the accounts. The paving requirement is a constant liability. From the very first the money invested in track pavements is an investment in franchise taxes and this money is all expended in creating a source of endless future taxation now expended under the guise of paving maintenance.

The capital stock of the United Railways Savings & Loan Association, composed of employees of the United Railways, St. Louis, Mo., has been increased from $2,000,000 to $2,500,000, being the third increase since the organization in 1915. The original capitalization was $1,000,000. The association has 2400 members, who are saving $25,000 monthly. Thirty new homes have been built for members, and sixty-five other homes purchased. Loans have been made to 190 others.

Co-operation Between Transportation and Equipment Departments

In order to impel platform men to assist in reducing equipment maintenance costs, H. W. Irwin, superintendent of car repairs Bay State Street Railway, recently furnished to *Bay State Triangle Talks* the following suggestions:

Ways in Which Motormen Can Save Money for the Company.

By notching the controller properly. This will save power and lengthen the life of motors, gears, controller and car body. It will reduce accidents, conduce to public comfort through smooth acceleration, create a better-natured conductor who will work more efficiently, and save some time.

By proper operation of the air-brake valve. This will save power and reduce wear and tear on air-brake and other equipment, and car body; will prevent accidents, create better public attitude through smooth braking, reduce number of flat wheels, save brakeshoe wear and make the conductor happy and cheerful, and therefore efficient.

By running slowly over special work and railroad crossings. This will save flanges, trucks, etc.

By not running on resistance, a common habit.

By using switch sticks as they are intended to be used; not as crowbars, sign sticks or ice chisels.

By being careful not to break windows when switch sticks are hung on front of car.

By opening and closing vestibule doors and windows properly.

By pushing in or holding up fenders before car is put in carhouse.

By watching clearance for double running boards, steps and arc headlights on corner of dashes.

By not running on three motors.

By proper handling of sand pail, scoop, motorman's seat, etc.

Ways in Which Conductors Can Save Money for the Company.

By giving proper signals. This will reduce accidents, save time and promote co-operation from the motorman.

By not slamming seat backs when turning, which loosens, mars and breaks them.

By not trying their strength on the register and bell cords.

By not dropping hinged fenders but rather lowering them carefully.

By not slamming double running boards down or up.

By not throwing and dropping tail lights.

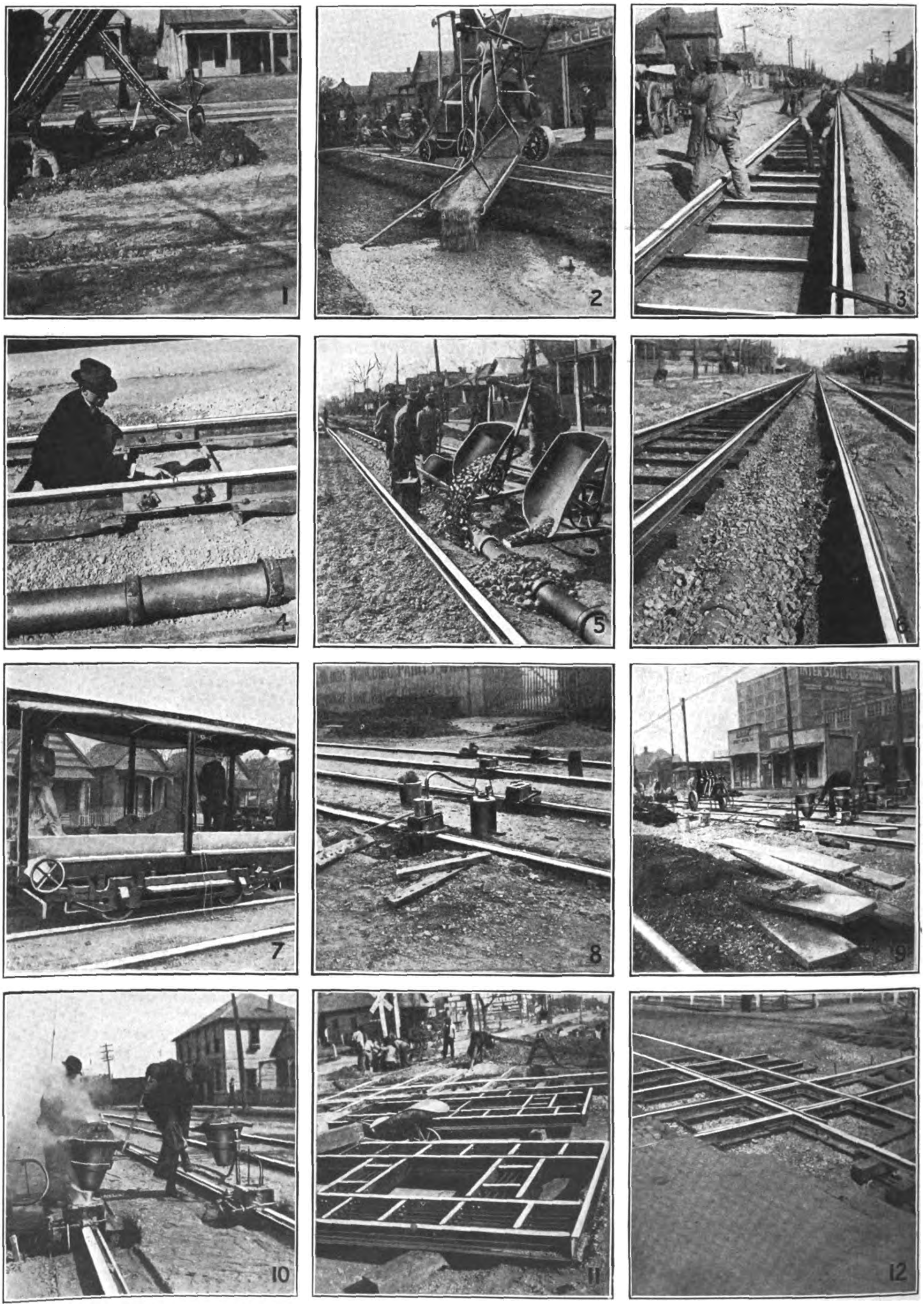
By turning off heaters when not required.

By handling adapter signs properly, not throwing them on the ground at the carhouse or under seats in the car, but rather placing them in the sign box.

By careful handling of sign sticks, flags, brooms, and pails and scoops.

Increase in Earnings

The earnings of the Arkansas Valley Interurban Railway, Wichita, Kan., practically doubled in 1916, on a 21 per cent increased mileage. The road is also showing gains this year over 1916. The freight business, which is about 12 per cent of the total, is increasing at practically the same rate as the passenger business. It is an interesting fact, in view of the passenger increase, that Sedgwick, Harvey and Reno, the three counties served by the interurban, have 11 per cent of the automobiles owned in the 105 counties of Kansas.



Track Construction Scenes in Dallas, Tex.

Illustrations Showing Methods of Preparing Roadbed, Welding Joints, Setting Steel Ties and Draining Track

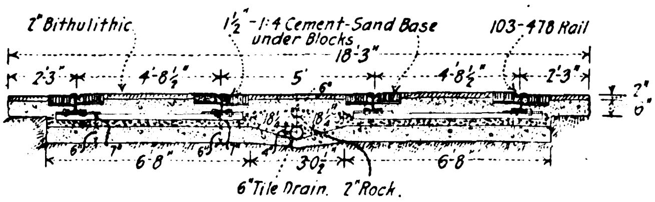
A Modern Type of Track Construction

Welded Joints, Steel Ties and Tile Drainage System Play Important Parts in New Track Work—The Author Describes the Methods Employed in Rebuilding the Recently Completed Double-Track System of the Dallas Consolidated Electric Street Railway

By R. G. TABER
Superintendent of Construction Stone & Webster Corporation, Dallas, Tex.

DURING the last few years track construction in permanently paved streets in Dallas, Tex., has been through a revolutionary stage, many new features being introduced, such as the Goldschmidt Thermit welded joints, International twin steel ties, gravel ballast with longitudinal tile drains, and numerous smaller details.

It is not the intention of the writer to describe in this article what he considers the best type of track construction, for during the last twelve years of his connection with city street railway track work many concrete opinions that were formed have been "knocked into a cocked hat." There still exist considerable differences of opinion as to what constitutes the best type of track construction on permanently paved streets, not only in Dallas but also in other cities. It has been proved here, and elsewhere as well, that the concrete beam construction without ties of any nature is an absolute failure. Another type, namely, the solid concrete construction with 6-in. concrete base under 6-in. x 6-in. wooden ties, spaced on 4-ft. centers, is not considered successful by all engineers, even though it is conceded to be far better than the beam construction. The rail becoming loose, either from cutting down into the tie and concrete or from pounding joints, which in the majority of cases is the cause of all loose rails, starts a pumping action, destroying the paving foundation and paving surface adjoining the rail. It is impracticable to break out the concrete for repairs, especially where operation has to be maintained. The solid concrete construction gives a very firm roadbed, to be sure, but in my opinion this rigidity plays an all-important part in the production of corrugation; in fact, this is considered by some to be the primary cause which creates this condition. Of course, there is corrugation to some extent on street railway tracks not laid with the concrete foundation, but not so much and it only occurs where the track has been down for some time and the ballast under the ties has become compact in place, thus losing its resiliency.



CROSS-SECTION OF NEW TRACK IN DALLAS, TEXAS

With the knowledge of these defects before us, our problem was to design a track adequately drained and resilient to a certain degree, and to eliminate the well-known trouble starter, the joint. In other words, we were trying to find that type of track construction of low first cost, which gives a long life with least maintenance cost. Whether or not the type of construction which the writer is about to describe is one of this class can only be answered by time, which condemned the beam construction and brought out the defects of the solid concrete construction.

On Jan. 3, 1916, the rebuilding of the double track of the Dallas Consolidated Electric Street Railway on Commerce Street from the H. & T. C. R. R. to Exposition Avenue, a distance of approximately 4800 ft., was started. The street was originally laid with Carnegie 77½-lb. low T-rail in macadam paving. The old track was torn out with No. 19 Barrett track jacks, and the rails were hauled about 1 mile and stacked at a cost of approximately 10 cents per lineal track-foot.

USE OF STEAM SHOVEL PROVES IMPRACTICABLE

The excavation, which was sub-contracted, was then started, and an attempt to do this with a steam shovel, as shown in photograph No. 1, was made, but to no avail, on account of the shallow cut. The shovel would take the street down only to within a tenth of the proper sub-grade and then it was necessary to dress off by hand. After a trial for two blocks the steam shovel was taken out, as it proved to be too expensive. It might be well to state here that as soon as any section of the ditch was completed, tile laterals, that were to connect to the main tile drain in the center of the completed track, were connected to the storm sewer inlets. This was done to drain the ditch in case of rain as quickly as possible and thereby to avoid delaying the work—just a little safety-first in actual construction. The ditch sloped from the outside edge toward the center. This was done to throw all seepage water into the drain and to avoid any puddling of the sub-base directly under the tracks. The trench completed, concreting was started as shown in photograph No. 2. This consisted in placing a 6-in. concrete sub-base or concrete mat, the aggregate being bank run gravel of the proper proportion, which was lined out along the side of the trench in convenient amount. The concrete mixer, a Koehring traction paver, used this gravel as the concrete was poured. Precaution was taken to have the slab slope toward the drain in the center to prevent any water from collecting under the ties and thereby causing the ballast to become mucky.

STEEL TIES USED

After this sub-base had set for about five days, the International twin steel tie was placed upon it on 6-ft. centers and the rails fastened thereto, as shown in photograph No. 3. The cross-section reproduced herewith shows the general detail of track construction used. The rail was the Lorain Steel Company's section 103-478 grooved girder with the latest curved head, this curved head being considered another aid for the prevention of rail corrugation. The rails were held together with 2-in. x 6-in. temporary wooden splice bars with a ¾-in. "dutchman" separating the rails, as shown in photograph No. 4. These joints were later welded. After the rails and the ties were in place, the ballasting followed. The method used in pulling the ballast into the track was described in the Jan. 6, 1917, issue of the ELECTRIC RAILWAY JOURNAL. It consisted in fastening one end of a rope to a scraper, passing the rope through a pulley which was hooked over a rail of the adjoining track, and tying the other end to a car. The scraper was taken out beyond the dirt pile and the car was started, causing the scraper to be pulled in toward the track, gathering a load of ballast as it came. The old adage that "necessity is the mother of invention" again proved to be true. Upon discovering that shoveling the ballast by hand was costing 12 cents per cubic yard and at that rate the item of ballasting would overrun the cost allotted, the above-mentioned scheme was resorted to, thereby reducing the cost to 5 cents per cubic yard.

TILE PIPE USED TO DRAIN BALLAST

While the ballast was being placed, the 6-in. tile drain in the center of the track (see photographs Nos. 5 and 6) was installed. This tile was laid with loose joints, covered with 2-in. rock, the tile being tapped off with a lateral to the inlet boxes in the gutter at approximately every 1000 ft. and then connected to the city's storm sewer as previously stated. When the ballast was placed the track was lined, surfaced and tamped to the proper grade. While the surfacing and tamping were being done on one track a water car filled with water and weighing 75,000 lb. was operated over the track previously tamped. These operations were carried on alternately until the slightest depression in the surface was cleared up and the tracks remained in good condition as to line and surface, care being taken that the ballast was thoroughly dampened while being tamped. The water car was operated over the track approximately ten hours prior to the laying of 6-in. concrete paving foundation, and by this means the ballast under the ties was thoroughly settled. The concrete paving base was then poured in the same manner as was the sub-base. At each joint concrete was left out to allow for welding.

WELDED JOINTS USED

Two days after the concrete paving base had set up the welding was begun, the temporary wooden fishplates being removed and the joints cleaned preparatory to the welding. The type of weld used was the Goldschmidt Thermit, as stated before. This method consists briefly of placing an insert in the ¾-in. opening left when the rails were placed, the rail being thoroughly cleaned and molasses asbestos strips applied around it about 2½ in. from the joints. Molds were made by the molder (photograph No. 7) and were then luted (photograph No. 8) after they had been made fast to the joint. The joint was then preheated (photograph No. 9), and in the meantime crucibles were made ready to pour when the rail ends were heated to a cherry red heat. The joint was then poured (photograph No. 10), after which it was dressed down by the grinder to the completed joint. The paving, which consists of a 2-in. surface of Bitulithic pavement with two rows of 3½-in. x 4-in. x 8-in. creosoted wooden blocks on each side of the rail, followed close behind the welding, and the job was finally completed on May 1, 1916.

FOUNDATIONS FOR CROSSINGS

In connection with this job, there were installed under one single-steam double-electric manganese crossing and one double-steam double-electric manganese crossing, the International twin steel crossing foundation. Photograph No. 11 shows the steel foundation for the single-steam double-electric crossing inverted, ready for concreting. Photograph No. 12 shows the crossing in place on the foundation.

Review of Workingmen's Compensation Acts

THE National Industrial Conference Board has just published a report entitled "Workingmen's Compensation Acts in the United States—the Legal Phase." According to this report, thirty-seven states and four territories of the United States now have such compensation laws, and the principal of workingmen's compensation applies to more than two-thirds of the wage earners of the United States. A striking feature of these acts are their inconsistencies. One source of conflict among them is the significance given to the term "accident." In the English compensation act, largely used as a basis for American legislation, the liability is expressed by the phrase "personal injury by accident arising out of and in the course of employment." In the compensation acts of fourteen states, this language is followed identically; in others, the words "by accident" are omitted, thus broadening the liability; in some cases the words "out of" are also omitted, further extending the liability to cover injuries received in the course of employment, although the occupation has no direct connection with the injury. For instance, the Ohio Industrial Commission awarded compensation to the dependent of a stenographer because, while taking dictation from her employer, she was murdered by a jealous suitor; the New York Industrial Commission awarded compensation for the death of a street railway process server from gangrenous diabetes, alleged to have resulted from having his toes trodden upon by a fellow-passenger in a street railway car of the company which employed him.

Several important constructive suggestions are made in the report. The first is that the various states, in order to reduce existing conflicts and uncertainty, immediately undertake to establish a permanent scientific and uniform system of compiling accident statistics. This would be a great step toward determining definite standards of liability and equitable compensation rates and would enable legislators to judge the real hazards of various occupations and "permit the just extension of the compensation principles to many workers now arbitrarily excluded from its terms." A second is that a clear distinction be drawn in statutes between "occupational disease," "accident" and "injury."

This report on the legal phase of workingmen's compensation act is to be followed by other reports on the medical, economic and administrative phases. The National Industrial Conference Board, whose headquarters are at 15 Beacon Street, Boston, is also conducting investigations of various other industrial problems on which reports will be issued in due course.

New Haven to Curtail Schedule

The New York, New Haven & Hartford Railroad plans to reduce its schedule by 199 passenger trains a week, subject to consideration with the public service commissions of Massachusetts, Connecticut, Rhode Island and New York, in compliance with the orders and suggestions of the special committee on National Defense of the American Railway Association. This curtailment is to be made in order to provide for the maximum movement of fuel, food, supplies and troops necessitated by the war. Of the total number of trains to be eliminated, 157 are weekday trains and forty-two Sunday. The curtailment of this service will be made where there will be the least interference with travel, and by discontinuing trains the patronage of which is light. The Massachusetts Public Service Commission ordered a hearing to consider the proposed curtailment of service.

How the Costs of Rendering Service Are Steadily Going Up

Comparison of Reports from a Number of Electric Railway Companies in All Sections of the Country Show Marked Increase in Materials and Labor—Statistics Are Given—The Effect of the War

By IVY L. LEE

IVY L. LEE

THE electric railways constitute the one great American industry which has so far been unable to adjust its prices to the increased costs of the last few years. The point has been suggested that electric railways should not seek exemption from the burdens of the war by imposing added charges upon the public. The fact is that electric railways are the only industry which so far has been unable to adjust itself to the burdens imposed before America entered the war.

Added costs incident to America's entrance into the war remain to be seen. The increased costs already encountered are not a result of the war—they are the result of a revolutionary change in all economic conditions which has been going on for the last ten years and which has become particularly acute during the European war.

It is the tendency which at the moment is at work which is the most dangerous factor in the situation. That tendency spells immediate bankruptcy for many companies; it spells danger in the future for very many more.

The world is undoubtedly approaching a state of economic exhaustion. The stock of what economists call the "consumable wealth" is being used up. That means that all the additional articles which are produced are, measured in terms of money, much more precious.

The vital fact relating to all commodities to-day—and street railway traffic is a commodity as much as anything else—is not only that the service or commodity itself is more valuable but that the dollar with which these commodities are purchased is very much less valuable.

Every industry in the world today is on an absolutely new basis. Revolutionary influences are at work. To disregard these influences, to refuse to admit the change in the economic weather which the barometric indications of the times undoubtedly foretell, is to do nothing less than to invite disaster.

The operation of every business is subject to a certain arithmetical equation which can no more be denied than can the oncoming of the tides. That equation is this: You cannot subtract a greater sum from a lesser.

If the street railway service of this country costs an average of 6 cents per passenger, that cost will have to be paid. The public may take it upon itself in the form of taxes rather than imposing it upon the person who uses the service. But that does not alter the fact that the bill will have to be paid. An essential part of that bill is the cost of obtaining the capital with which to render the service. These are economic considerations of the most fundamental character, yet it is astonishing how many public officials remain blind to them.

To find out just what the facts are, and especially the tendencies which are at work, the ELECTRIC RAILWAY JOURNAL recently addressed a questionaire to a large number of electric railway operating companies in different parts of the country. The results of these inquiries are most interesting. They are primarily indicative of the tendency. The actual figures do not yet disclose the results of the abnormal influences which are at work with steadily increasing intensity. But what has happened is startling enough.

It may be that particular companies will show favorable results even under present conditions, but to arrive at a sound conclusion as to the industry as a whole, fundamental tendencies universally at work must be studied. If those fundamental tendencies are undermining the industry, is it not vital to the industry as a whole that steps be taken to neutralize these tendencies? That can only be done by arranging that the public shall pay the increased costs for the service it is receiving.

Below will be found a recapitulation of the reports received from all over the country.

LABOR AND SUPPLIES

The cost of labor to electric railway companies may be very roughly stated to have risen during the past five years by about 25 per cent. This estimate is based upon returns from eighteen states and, if anything, is below the mark. The change in the wage factor has been less in the West than in the East. An electric railway operating on the Pacific Coast, for instance, reported that the added burden of increased labor cost was about 10 per cent. At the other extreme are Pennsylvania and Connecticut, where the demands of the steel plants and munition factories at times made unskilled labor almost unobtainable. In Pennsylvania one company reports having had to pay an increase of 100 per cent for common labor employed in track laying and other construction work, and from Connecticut comes a report showing an increase of 60 per cent for this labor.

The rise in wages of semi-skilled labor has been less, but taking the average motormen, conductors, yard hands, etc., the following increases may be accepted as thoroughly conservative: In Missouri, from 15 per cent to 20 per cent; Indiana, 20 per cent to 25 per cent; Wisconsin, 20 per cent; Maryland, 25 per cent to 30 per cent; Georgia and Massachusetts, about 30 per cent; Connecticut, from 17 per cent to 40 per cent; California, from 25 per cent to 45 per cent; Maine, from 15 per cent to 50 per cent, and Pennsylvania, from 25 per cent to 60 per cent.

The cost of materials and supplies used by electric railway companies has increased at least 42 per cent in the last three years. This is indicated by comparing 313 items used by eighteen different corporations scattered all over the United States.

While weighted averages are not available, the following table shows the classification of the items, the number considered under each classification and the average per cent increase in present price over the price paid during the first half of 1914:

Division		Number of Items Considered	Average Per Cent Increase in Price Last Order Over Price Paid First Half 1914
1	Car truck parts	35	28.8
2	Car motor parts	35	41.1
3	Car controller parts	21	33.3
4	Car air brake parts	20	6.7
5	Car headlight parts	13	42.8
6	Car trolley parts	16	66.8
7	Car circuit breaker and contactor parts	6	49.3
8	Car supplies—Miscellaneous	43	38.4
9	Car parts—miscellaneous	20	20.4
10	Paint, varnish, etc	16	43.0
11	Wire, miscellaneous	8	38.0
12	Nails, screws, iron, etc	17	113.9
13	Track material	14	56.1
14	Overhead line material	25	38.4
15	Miscellaneous tools and supplies	24	51.0
		313	....
	Grand total for 313 items	..	42.0

In some parts of the country the total average increase seems to have been less; in others it is considerably more. The figures vary from 25 per cent increase on the Pacific Coast, to 50 per cent increase in the Eastern states. Some of the individual items have soared out of all proportion to the aggregate. Paints and varnishes, from linseed oil to English vermilion, have gone up, the former, 140 per cent, the latter, 470. Wire goods from nails to magnet wire have risen from 100 per cent to 150 per cent. Brakeshoes are up 200 per cent, and in some cases steel castings and tool steel have also trebled in price.

Steel rails have steadily risen and current prices vary from 30 per cent to 42 per cent above 1912 quotations. Rail bonds are up 80 per cent, and fastenings and points and pole-line hardware show similar increases. Ties have risen from 25 per cent to 40 per cent, and all lumber shows heavy advances, creosoted pine poles now being 75 per cent above what they were five years ago. It can be stated as an absolute fact that a car costing less than $5,000 only three years ago costs to-day something in excess of $8,000.

The costs of materials are steadily rising. The prospective shortage in industrial labor will be reflected in progressive increases in material costs. To the extent that the government absorbs commodities necessary for the war there is an increased price which must be paid by the electric railway company for its materials: it is a direct burden of the war.

FUEL AND TAXES

Fuel has undergone and is undergoing an extraordinary increase in value. Of course, to some extent many corporations have been protected by long-time contracts or supplied with hydroelectric power, but those which have had to rely mainly on coal and have had to go into the open market and make their purchases, have paid as high as 100 per cent more than they did five years ago. One corporation in Connecticut was caught short during the worst period of last year and paid 360 per cent more for coal than the 1912 price. Another corporation in Ohio and one in Maine paid 200 per cent more, and all over the country increases of from 45 per cent to 100 per cent in fuel costs have been common among inadequately protected corporations.

New fuel contracts for next year are being made. In this item is to be found one of the most serious menaces to railway income accounts.

Taxes have increased on an average about 40 per cent in the last five years. Electric railways in Connecticut, to be sure, have benefited by a change in the law, and now that the assessment is levied by a percentage tax on gross revenue the taxes paid by the company have decreased about 6 per cent.

On the other hand, electric railway taxation in California has increased 269 per cent in ten years. Varying municipal taxation in different cities accounts for one corporation in the Middle West paying only 25 per cent increase over the taxes of five years ago, while another corporation in the same state but in a different town has seen its taxes increased 84 per cent in the same time. Cities in Ohio have been particularly severe on electric railways, the increase having been nearly 80 per cent.

SPECIAL EXPENSES DUE TO REGULATION

Most of the companies canvassed do not appear to keep very accurate track of these costs which, of course, fluctuate with irregularity. Some corporations seem to think that the expense to them of public regulation is trifling compared with the materially improved service and more up-to-date operation which it has secured. Others advance the theory that much of the time of highly-paid executives and experts is frittered away at public hearings on frivolous complaints.

Some states require very full reports and valuation returns, and in California the cost of compiling these is estimated by one corporation as having exceeded $100,000 since 1912. Some companies which make a separate accounting of the cost of public regulation place it as high as 2 per cent total gross operating expenses.

The cost of regulation, however, cannot be considered an abnormal burden. The results of regulation are too valuable. But the cost ought to be borne in mind as a fact; the benefits accrue to the public quite as much as to the companies.

LOSSES FROM COMPETITION

The general public has no conception of the enormous losses caused to the electric railways by the competition of the pleasure vehicle and the too often derided jitney bus. The estimates of various corporations differ widely, but a careful study of actual figures leads to the conclusion that every pleasure vehicle takes 25 cents a day out of the gross traffic receipts of the electric railways of the city in which it is run. In some cases in the Western states the aggregate loss amounts to 25 per cent of the gross traffic receipts.

In large cities like Boston and St. Louis, where the companies have made an effort to keep careful track of this factor, the loss runs from $3,000 to $4,000 a day. In Boston, where this loss has been subdivided, it is found that the jitney takes 6,000,000 nickels a year from the electric railways, and the automobile 22,000,000 nickels a year, a total loss of $1,400,000.

It will thus be seen that the added burden of the increase in cost of labor and in cost of materials and supplies combined with the ever-growing competition of jitney buses and automobiles, has been such in the last five years that it is only by paying the closest attention to economy and operating efficiency that many electric railways have been able to continue operation at all on the present 5-cent fare.

EFFECT OF THE WAR

The entry of the United States into the war will undoubtedly have a further adverse effect upon their economic situation. This country hardly realizes as yet that it is at war, but as the part taken by the United States in the actual conflict grows more and more important, war conditions will very rapidly press themselves upon every phase of our industrial and commercial life. The electric railways will be principally affected by the decrease of their earning power and the increase of their costs of operation.

It cannot be doubted that war conditions will increase the cost of labor and bring about higher wages, because all over the country the demand for semiskilled labor in mechanical trades will be greatly increased, and this will mean a corresponding rise in wages.

There is no reason to doubt that the present ascending scale of prices will be maintained not only until the end of the conflict but perhaps for two or three years after the restoration of peace.

Increased taxes will also be inevitable. The tendency among the national, state and municipal legislatures is very clearly toward increasing the taxes paid by corporations.

If costs will continue to soar under war conditions, the earning power of the electric railways will also be decreased. A great many trained men have already joined the colors and the selective draft will in many instances take young men between the ages of twenty-one and thirty whose places it will be impossible to fill. This factor reaches all through every branch of electric railway operation from the clerical forces in the president's offices to the unskilled labor in the construction department, but it will perhaps be most keenly felt in the engineering, mechanical and operating branches.

Besides the men called to the colors, others undoubtedly will be attracted by the higher wages offered elsewhere to fill the labor shortage in other mechanical trades. All this will lead to decreased efficiency of the operating forces and disorganization in the staffs. The net result will be a decrease both in the quality and quantity of labor which in turn cannot fail to decrease earning power.

Another factor which must not be lost sight of is the freight situation. Car shortage and embargoes will lead to deferred delivery of materials necessary to the maintenance and construction. There can be no doubt that in order to move the crops and handle the food situation as well as transport the enormous quantities of supplies which the government must have, it will be necessary to impose embargoes upon freight not essential to the conduct of the war.

* * *

The foregoing covers in a very general way a statement of the more fundamental factors which are at work. It is our purpose next week to print specific replies received, although the names of companies, according to our agreement, will be withheld. It is of moment that this whole question should be considered broadly on its merits rather than be judged with reference to merely local considerations or prejudices.

War Preparations Effect Traffic Increase

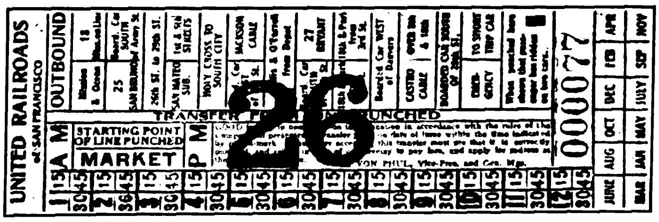
Since war preparations began the United States Quartermaster's Depot at Jeffersonville, Ind., has increased greatly in importance. From a few hundred, the number of seamstresses called there for work has been swelled to several thousands. The Louisville & Southern Indiana Traction Company, issuing transfers from the New Albany-Jeffersonville line to the Jeffersonville city car running to the depot, carries many from New Albany. The large amount of sewing has interested women on the Kentucky side of the river, and hundreds daily cross for the bundles of white canvas distributed by the depot. The cross-river service has been from station to station, and the jitneys began to monopolize the business from the Jeffersonville station to the government depot. A swarm of them entered the field, and prospered until the railway instituted a through service from the interurban station at Louisville to the government depot in Jeffersonville, fare 10 cents each way, with the result that the jitneys have virtually been put out of business. They swarmed to such a degree that the chief of police of Jeffersonville sought to have the City Council enact a $25 license ordinance. In this attempt, however, he failed.

Eight Transfers for Fifty-two

How United Railroads of San Francisco Has Mitigated the Terror of Transfer

LIKE other railways, the United Railroads of San Francisco has never lost sight of the losses due to the reckless and wrongful use of transfers. However, the rising cost of railroading, including the increase in paper itself, recently proved an extraordinary stimulus for improvement. In consequence a new transfer has been adopted, which reduces the varieties of transfers from fifty-two down to eight, as it is not necessary to have a separate transfer for each line.

Aside from this saving, the new transfer has also decreased the average number of transfer complaints from eight a day to that number per month. It has also cut the average length of ride because it has helped the transfer passenger to take the shortest route to his destination. Another advantage is that it is used by front-end street collectors, who identify their issues by perforating the section marked "Extra Conductor."


UNITED RAILROADS of SAN FRANCISCO
OUTBOUND
TRANSFER
PUNCHED
STARTING POINT OF LINE PUNCHED
MARKET
A M
P M
26
000077
VON PHUL, Vice-Pres. and Gen. Mgr.
JUNE
AUG
OCT
DEC
FEB
APR
MAR
JAN
MAY
JULY
SEP
NOV

GROUP STYLE OF TRANSFER—SAN FRANCISCO

All the routes of the company are divided into four groups: Group 1 comprises all lines terminating at Market Street Ferry. On this group a yellow transfer is used for inbound passengers and a white transfer for outbound passengers. These transfers show issuing group and the destination.

Group 2, of routes, comprises the lines terminating at Market Street or at the Southern Pacific Depot. Here, too, inbound transfers are yellow and outbound transfers are white.

Group 3 comprises the lines crossing Market Street. Pink is used for northbound and orange for southbound transfers.

Group 4 comprises short-trip or feeder lines. On these lines only one (white) transfer is required as the punch showing the destination takes care of the direction.

These groups call for seven varieties of transfer. The eighth variety is that issued at the corner of Kearny and Polk streets to the Municipal Railway on Geary Street. This transfer is yellow.

Passengers understand now that one transfer will enable them to ride on three cars when necessary. The conductor of the second car validates the transfer by punching the section which reads: "When punched here shows that passenger has ridden on two cars." This transfer so validated is taken upon the third car. No record of this intermediate travel is made by the conductor of the second car inasmuch as the transfer itself tells the story.

From the third car a passenger can transfer to a feeder connection by asking for a short-line transfer. There are, of course, certain exceptions to prevent doubling back, but these are few and readily understood by all concerned.

Third Avenue Opens Fare Case

Opening Hearings Before the New York City Commission Deal with Counsels' Arguments Regarding Power of the Commission and with a Presentation of Financial Exhibits

THE campaign for increased electric railway fares in New York City was begun in earnest on Monday, June 18, with the opening presentation of the case of the Third Avenue Railway to the Public Service Commission for the First District of New York. The hearings continued all day Tuesday, and were scheduled also for Thursday and Friday.

From the very beginning it was evident that counsel for the city intended to oppose the company upon every conceivable ground. It was apparent that an attack would be specially directed against the company basing its case upon a reorganization valuation made in 1910. Furthermore, questions were raised as to how the refusal of the company to obey a depreciation order of the commission in 1912 should affect its calculations of a fair return, and as to whether the present financial condition of the company is to be permanent or is merely the temporary result of the long strike in the second half of 1916. The city challenged the power of the commission to increase rates and in general took technical exceptions to the company's exhibits upon the ground of irrelevancy.

OPENING STATEMENT BY COMPANY

In his opening statement for the Third Avenue Railway, Alfred A. Cook pointed out at length the financial ills of the company and the reasons for its application for relief. He outlined from statistics, later presented the steady decrease in receipts and the increase in expenses during the last few years, and said that even the desired 2-cent charge for transfers might not prove sufficient. Such relief would help, however, and all that the company desired was plain, simple justice. It was not asking for stock dividends, Mr. Cook said, but for a fair return on its honest physical valuation so as to avoid disintegration of the property.

Mr. Cook averred that under the Public Service Commission law the commission has power to increase rates so as to give a fair return. In his opinion the Ulster & Delaware decision by the New York Court of Appeals shows this conclusively. He referred to a recent decision by Charles E. Hughes as referee in a Brooklyn Borough Gas Company case, to the effect that the commission cannot increase rates above the 80-cent maximum prescribed by law. He explained, however, that the Public Service Commission law contains a specific mandate limiting commission jurisdiction over gas rates, but that no such prohibition exists in the case of electric railways, and the commission can act in exercise of the fully delegated power of the legislature either to lower or raise their rates. Mr. Cook also mentioned the North Shore Traction Company decision as showing that franchise rate provisions must give way when the legislature speaking through the commission believes that a carrier is receiving less than a fair return.

CITY MOVES TO DISMISS CASE

Ernest E. Baldwin, special counsel for New York City, challenged the jurisdiction of the commission to grant the relief asked and also the competency and the adequacy of the company's petition. He asserted that if the company needed justice it must look to the Legislature. Moreover, if the commission had jurisdiction in the matter, the company's petition should show, first, that the present rates are insufficient, and, second, that they are unjust and unreasonable. If the existing rates are insufficient, the strike of last year is the cause, for operating costs have been about constant. In his opinion, therefore, the rates are not unjust or unreasonable. Chairman Oscar Straus refused to dismiss the company's petition, but stated that he would take under advisement Mr. Baldwin's motion regarding the power of the commission.

COMPANY REVENUES HAVE DECREASED

In support of its petition for relief the Third Avenue Railway filed various financial exhibits, some of which

TABLE I—CONSOLIDATED INCOME STATEMENT OF THIRD AVENUE RAILWAY FOR THE FOUR MONTHS ENDED APRIL 30

	1917	1916	1915	1914
Car mileage...	11,028,903	11,335,485	11,458,284	10,733,942
Operating revenue:				
Transportation ..	$3,236,709	$3,407,895	$3,285,729	$3,098,647
Advertising	26,666	26,666	26,666	36,833
Rents	56,478	54,851	56,491	63,631
Sale of power....	14,391	14,127	8,054	36,911
Total operating revenue	$3,334,246	$3,503,542	$3,376,942	$3,236,024
Operating expenses:				
Maintenance of way	$256,766	$193,144	$227,492	$266,818
Maintenance of way — Removal of snow, ice and sand	61,827	123,974	48,645	143,498
Maintenance of equipment	253,429	201,711	222,647	230,221
Power	329,539	259,591	264,451	262,311
Operation of cars	1,015,438	976,027	944,350	922,136
Injuries to persons and property..	306,929	251,278	211,130	260,975
General and miscellaneous ...	151,904	175,254	167,536	156,521
Total operating expenses—not including depreciation ..	$2,375,835	$2,180,983	$2,086,254	$2,242,483
Net operating revenue	$958,411	$1,322,558	$1,290,687	$993,540
Taxes	276,594	295,191	242,694	239,434
Operating income.	$681,816	$1,027,367	$1,047,992	$754,105
Interest revenue...	55,549	54,616	26,416	26,844
Gross income...	$737,365	$1,081,983	$1,074,409	$780,950
Deductions from income:				
Interest on underlying mortgage bonds	$182,693	$182,693	$182,693	$187,808
Interest on first refunding bonds	293,206	293,206	266,266	232,406
Interest on adjustment mortgage bonds ..	375,600	375,600	375,600	375,600
Interest cn notes payable	1,498	2,101	3,192	41,391
Track and terminal privileges	4,553	4,734	4,813	4,386
Miscellaneous rent deductions	3,339	4,176	5,564	5,036
Amortization of debt discount and expense...	6,148	4,295	972	972
Sinking fund accounts	11,160	10,000	10,000	10,000
Miscellaneous ...	8,550	7,990	2,932	2,560
Total deductions	$886,750	$884,798	$851,935	$860,162
Net income—not including depreciation	*$149,384	$197,184	$222,373	*$79,212
Deduct depreciation reserve	....	....	189,680	170,000
Net income	*$149,384	$197,184	$32,693	*$249,212

*Deficit.

TABLE II—EFFECT ON NET INCOME OF THIRD AVENUE RAILWAY HAD THE MAINTENANCE EXPENSES AND THE DEPRECIATION ALLOWANCE EQUALLED 20 PER CENT OF OPERATING REVENUES

	Four Months, Jan. 1 to April 30				Twelve Months to June 30			
	1917	1916	1915	1914	1916	1915	1914	1913
Operating revenue......	$3.334,246.56	$3.503,542.37	$3,376,942.18	$3,236,024.11	$11,136,370.18	$10,885,859.39	$10,858,216.03	$10,117,847.36
20 per cent pursuant to Public Service Commission orders to cover actual maintenance and depreciation.....	$666,849.31	$700,708.47	$675,388.43	$647,204.82	$2.227,274.03	$2,177,171.87	$2,171,643.20	$2,023,569.47
Maintenance and depreciation—per the books:								
Maintenance of way and structures	$318,594.42	$317,119.04	$276,137.83	$410,317.11	$1,090,700.85	$925,973.89	$1,012,646.16	$838,620.95
Maintenance of equipment	253,429.01	201,711.68	222,647.11	230,221.03	599,549.69	678,573.99	713,003.13	614,792.51
Depreciation reserve..	....	....	189,680.94	170,000.00	294,271.00	562,958.80	511,250.00	461,500.00
Total	$572,023.43	$518,830.72	$688,465.88	$810,538.14	$1,984,521.54	$2.167,506.68	$2,236,899.29	$1,914,913.46
Additional charge necessary under Public Service Commission orders	$94,825.88	$181,877.75	*$13,077.45	*$163,333.32	$242,752.49	$9,665.19	*$65,256.09	$108,656.01

*Excess over depreciation charge under commission orders.

are reproduced herewith. Through Table I, for example, and through the testimony of its public accountant, John Flint, of West & Flint, New York, the company showed that in the first four months of 1917 the total operating revenues decreased to $3,334,246 from $3,503,542 for the similar period in 1916. In 1917, however, the total operating expenses (not including depreciation) rose from $2,180,983 to $2,375,835. The net income (not including depreciation) was a surplus of $197,184 in 1916 and a deficit of $149,384 in 1917.

To bring the showing closer to date, the company reported receipts of $884,510 for May, 1917, as compared to $985,032 for this month in 1916, a decrease of $100,522 or $3,242 per day. At the same time the mileage decreased 200,562 car miles or 6470 per day. Of the eleven reporting companies in the system, all but one showed lower receipts. For the period from Friday, June 1, to Tuesday, June 19, 1917, inclusive, as compared with that from Friday, June 2, to Tuesday, June 20, 1916, the receipts decreased from $602,365 to $567,633, or $34,731. The company expects to present full figures up to the latest possible day.

In presenting revenue and expense figures the company disregarded the strike period during the second half of 1916. Consequently the last yearly figures were for the fiscal year ended June 30, 1916. The main subsequent figures were for the first four months of 1917, which could be compared with a part of 1916 not affected by the strike.

THE QUESTION OF DEPRECIATION

The introduction of Table II and Table III by the company met with considerable opposition on the part of city representatives and, on some points, even commission counsel. It appears that on Feb. 3, 1912, the commission ordered the company to set aside each year, before paying adjustment income bond interest or dividends, 20 per cent of its gross operating revenue for "maintenance, depreciation and renewals," the unexpended amount at the end of each year to be credited to a separate depreciation reserve. This order the company has refused to obey to the letter, although from evidence presented at the latest hearing it appears that in effect the commission requirement has been more than met.

As explained by Mr. Flint, the company beginning with the six months ended June 30, 1912, set aside a large sum of cash for depreciation irrespective of maintenance. The amount began at $30,000 a month, the reserve set up for the six months being therefore $180,000. The reserve fund accumulated to $2,009,979 and was invested in company bonds. After Dec. 31, 1915, there were no further additions to the fund. The totals set aside for the respective fiscal years ended June 30 follow: 1913, $461,500; 1914, $511,250; 1915, $562,958, and 1916, $294,271.

In calculating the additional charge that would have had to be made under the commission order, the company has not included in operating revenues intercompany items for rentals. On this basis the 20 per cent charge for maintenance and depreciation under the commission ruling amounted to $9,512,516 for the four and one-half years from Jan. 1, 1912, to June 30, 1916. During this period the company's actual expenditures for maintenance of way and structures and maintenance of equipment totaled $7,173,851. This, combined with the depreciation reserve set up by the company to the abovementioned extent of $2,009,979, gave an aggregate amount of $9,183,831 for actual maintenance expenses and depreciation reserve during the period. This represents a deficiency of $328,685 from the charge to operating expenses arising under the 20 per cent requirement of the commission.

As more than an offset to such a deficiency, however, the company reports charges against surplus during the period to the extent of $339,599 for retirements of property. For the fiscal years ended June 30, these charges were: 1914, $36,340; 1915, $204,497, and 1916, $98,761. These charges, the company states, are equiv-

TABLE III—STATEMENT OF INCOME OF THIRD AVENUE RAILWAY FOR THE PERIOD JAN. 1 TO APRIL 30, 1917 (WITH COMPARISONS OF OTHER YEARS), SHOWING THE AMOUNT OF RETURN

	Four Months' Period, Jan. 1 to April 30			
	1917	1916	1915	1914
Operating income.........	$681,816	$1,027,367	$1,047,992	$754,105
Less deficiency in depreciation pursuant to commission rulings	94,825	181,877	*13.077	*163.333
Operating income after allowance of 20 per cent for maintenance and depreciation.....	$586,990	$845,489	$1,061,070	$917,439
Interest revenue:				
Interest on bonds held by system in funds and interest on bank accounts and special deposits	55,549	54,616	26,416	26,844
	$642,539	$900.105	$1.087,487	$944,283
Deductions—rentals, etc.:				
Track and terminal privileges	$4,553	$4,734	$4,813	$4,386
Miscellaneous rent deductions	3,339	4,176	5.564	5.036
Amortization of debt discount	6,148	4,295	972	972
Sinking fund accruals	11,160	10,000	10.000	10.000
Miscellaneous	8,550	7,990	2.932	2,560
Total deductions—rentals, etc.	$33,752	$31,197	$24.282	$22.956
Amount applicable for reserves for contingencies, interest, dividends, surplus, etc.	$608,787	$868,907	$1.063.204	$921,327

*Excess over depreciation charge under commission orders.

alent to appropriations of surplus for the purpose of a depreciation reserve and show that the order of the commission has in effect if not in method been fully carried out. Thus none of the reservation ordered by the commission has been omitted on account of dividends, as was alleged by counsel for the city. By a similar calculation for the five years ended Dec. 31, 1916, the company showed that the deficiency of $259,782 below the 20 per cent operating expense requirement of the commission was more than offset by surplus charges of $390,296 for retirements of property.

Before the above data had been introduced by the railway, the commission allowed Table II to be entered as a hypothetical exhibit. Commission counsel strongly urged, however, that in the precedent finding of fact as to the sufficiency of present rates, only actual expenditures and reservations should be considered, but he said that the whole 20 per cent charge might be used in calculating a fair return for the future. Commissioner Travis H. Whitney asked Mr. Cook whether the company would obey the depreciation order in the future, and whether, if the charge for transfers were granted, it would agree to expend certain portions of the added revenues in ways designated by the commission. Mr. Cook stated that he would be glad to take these points up with the board of directors.

THE VALUATION OF THE PROPERTY

According to Table III, the amount applicable for interest and dividends for the first four months of 1917 was $608,787. After eliminating from this about $40,000 for intercompany bond holdings, the annual rate of return was 3.877 per cent on a physical valuation of $44,000,000. If 6 per cent is a fair return, there is a shortage of $311,312 for the four months' period, and if 8 per cent is fair, a shortage of $604,646.

The valuation figure of $44,000,000 was accepted by commission counsel as hypothetical pending reasonable proof. Its admission was challenged by the city. The figure was used by the company in its table simply because it was the one derived by the commission itself in the 1910 reorganization case of the Third Avenue Railway. After making a detailed appraisal of the physical property on the reproduction-cost basis, the commission then arrived at $35,100,000 as the present value of the property as of Feb. 28, 1910. To this was added $1,746,000 for current assets and $7,200,000 for a cash assessment, giving a total of about $44,000,000.

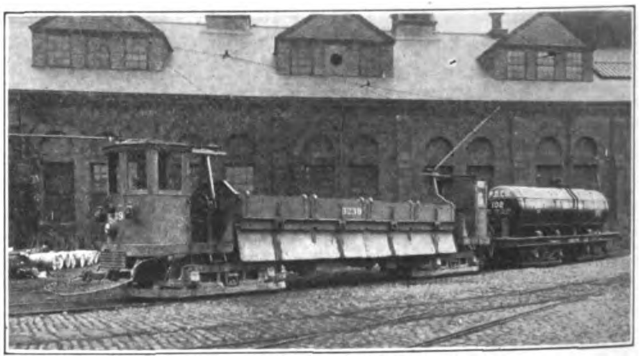
The city objected even to the use of this figure in calculations on the ground that it was derived in a capitalization case and that it would not meet the requirements in a rate case. Counsel for the company suggested that in 1910 there was no difference noted and that the commission established its figure for the physical value as it would have done in a rate case. The commission finally allowed the old orders dealing with the matter to be entered as evidence, to be considered upon their merits.

Tests to Determine Properties of Iron Alloys

The engineering experiment station of the University of Illinois has just completed another series of experiments to determine the magnetic and allied properties of alloys of iron and other metals. In 1915 experiments with iron-silicon alloys disclosed some remarkable properties which make it superior to any other material for use in certain electromagnetic machinery. These experiments were followed by others dealing with iron-aluminum alloys melted in vacuo, which have shown that aluminum, like silicon, greatly improves the magnetic properties of the metal, and also that aluminum imparts to the metal a greater toughness than silicon. The investigations were conducted by T. D. Yensen and W. A. Gatward. The results are presented in detail in Bulletin No. 95 of the Illinois Engineering Experiment Station, copies of which may be obtained by addressing C. R. Richards, director, Urbana, Ill.

Off-Peak Tank Car Service at Boston

THE advantages of off-peak electric freight traffic on a carload basis are well illustrated by a tank-car haulage service inaugurated in the latter part of 1916 by the Boston Elevated Railway. This service consists of the transportation of molasses from Copps Hill Wharf, Boston, to the plant of the Purity Distilling Company in Cambridge, the product being hauled in tank cars of about 5000-gal. capacity owned by the distilling company and built according to the specifications of the railway company. The traffic is handled between the hours of 8 p. m. and midnight, which are entirely outside the peak-load period of the railway. Either side-dump cars or snowplow motor cars are utilized as electric locomotives in this service without additional investment in rolling stock. The former are used in winter and the latter in summer. The accompanying illustration shows a typical train unit.



INCREASING THE SERVICE FACTOR OF ROLLING STOCK ON THE BOSTON ELEVATED

Molasses is received at Copps Hill Wharf in shiploads, a berthing space 400 ft. long being available. The molasses is pumped from the vessel into a storage tank of 1,500,000-gal. capacity and thence is pumped into the tank cars via a loading tank, the average time of filling per car being about four minutes. A maximum of twelve tank cars have been filled, hauled to East Cambridge and emptied in one night's run, three motor cars being required. The length of haul is about 2 miles from terminal to terminal and about ten minutes are required to empty each car. The motor and tank cars are equipped with air brakes. Two men constitute the locomotive crew on each trip.

The distilling company manufactures pure alcohol for commercial purposes, and before the present service began informed the Public Service Commission of Massachusetts that the former teaming expense practically absorbed all the profits of the business. The teaming charge was 0.3 cent per gallon. The Boston Elevated charge is $9 per loaded tank car one way, or 0.18 cent per gallon. About 12,000,000 gal. of molasses per year are handled. Thirteen trucks were formerly used in the service and a reduction in street congestion, wear and tear has been effected by electric haulage.

Have the New York Commissions Power to Increase Fares?

The Author Answers This Question in the Affirmative and Shows Why

By JAMES L. QUACKENBUSH
General Attorney New York Railways Company

In view of the question which has been raised as to the power of the New York Public Service Commissions to grant an increase in street railway fares, as against the provision in the New York Railroad law (Section 181, passed 1884), fixing a statutory fare of five cents, peculiar interest attaches to the following quotations from a memorandum filed by Mr. Quackenbush with the New York Public Service Commission of the First District. The memorandum is comprehensive, and the quotations are but fragmentary. They are, however, very significant and pertinent to the situation. EDITORS.

THE general authority to adjust the charges to be made by the corporation as compensation for the service, as distinguished from the character of service which it may be required to furnish the traveling public is given by Subdivision 1 of Sec. 49 of the public service commissions law. That section gives the commission complete supervision over "rates, fares or charges, . . . regulations or practices, . . . affecting such rates," in order that it may determine whether they are "unjust, unreasonable, unjustly discriminatory or unduly preferential, or in any wise in violation of any provision of law, or whether the maximum rates, fares or charges . . . are insufficient to yield reasonable compensation for the service rendered and are unjust and unreasonable"; with the further power of determining the "just and reasonable rates, fares and charges to be thereafter observed and in force as the maximum to be charged for the service to be performed."

The standard by which the commission is to be guided in determining the rates and fares to be ordered is, that they shall produce a "reasonable average return upon the value of property actually used in the public service" and enable the corporation to make "reservation out of increase for surplus and contingencies."

The jurisdiction of the commission with respect to rates and charges under this subdivision is sweeping, being held to be virtually "without statutory limitation or restraint."

It will be seen at a glance that the language of this subdivision does not contemplate a mere raising or lowering of rates already established by the common carrier, but clothes the commission with full power to regulate and supervise the entire system of rates and charges and the regulations and practices with respect thereto.

The commission may therefore not only adjust old rates but prescribe new charges for particular kinds of service where no charge was previously made, as well as discontinue charges which, in its judgment, are unjust, unreasonable, unjustly discriminatory or unduly preferential.

In short, the general power to regulate fares resting with the legislature, which is absolute and unlimited except as restrained by the constitution, has been delegated to the Public Service Commission by Sec. 49 of the public service commissions law, together with Sec. 181 of the railroad law, the latter specifically giving to the commission the same power possessed by the legislature to regulate rates of fare "to be exercised as prescribed in the public service commissions law."

Several authorities have held the power of the Public Service Commission to fix rates under Sec. 49 of the public service commissions law or statutes of similar import to be virtually without statutory limitation or restraint.

STATUTORY POWER TO RAISE RATES ALREADY ESTABLISHED

The question was raised as to the authority of the Public Service Commission for the Second District to increase the mileage book rates of the Ulster & Delaware Railroad in excess of the 2 cents per mile, fixed by Sec. 60 of the railroad law. The commission, after investigation, determined that the facts justified the increase but denied the application because of a want of statutory power in the commission to make the order.

The Appellate Division and Court of Appeals held that the commission had the necessary power to make such order, notwithstanding Sec. 60 of the railroad law, which provided that certain railroad corporations should issue mileage books "for which the corporation may charge a sum not to exceed 2 cents per mile." The power of the commission to prescribe maximum fares with respect to mileage books was given by the second paragraph of Sec. 49 of the public service commissions law, which is similar to the first paragraph of that section, heretofore quoted, except that the first paragraph contains the following words, to wit: "Notwithstanding that a higher rate, fare or charge has been heretofore authorized by statute."

The court held that the revision of the public service commissions law and the railroad law in 1910 indicated an intent on the part of the legislature to harmonize the railroad law with the public service commissions law and to make the public service commissions law superior to Sec. 60 of the railroad law in the matter of fixing limitations on rates of fare, and the court therefore reached the conclusion that in order to give full effect to the provision of Sec. 49 of the public service commissions law the commission should determine the reasonable and just rates to be observed as the "maximum."

Sec. 60 of the railroad law should be construed as establishing the maximum rate in the absence of an order by the commission, which body was empowered to fix rates without statutory limitation or restraint. The court said:

"Nothing like these provisions in Secs. 49 and 33 had ever existed before. In all the previous history of the public service commissions law the power of the commission had been confined to reducing rates, or at least to regulating rates within the statutory limitations. The law contemplated simply a reduction of rates by the commission in the interests of the public, and not an increase, even though such increase might be just and reasonable to the carriers.

"The effect of this new legislation was, I think, to make the commission superior to Sec. 60 of the railroad law, fixing limitations on the rates of fare."

In *States ex rel. Missouri Southern R. Co. v. P. S. Comm. of Missouri,* 168 S.W., 1156 (Sup. Ct. of Mo., July 2, 1914), it was held that Sec. 47 of the public utilities act of Missouri, which was borrowed from Sec. 49 of the New York public service commissions law, empowered the Public Service Commission of that State to authorize a common carrier, where the maximum rates prescribed by statute did not produce a reasonable return on the value of the carrier's property, to charge greater rates and fares than the maximum rates so prescribed.

* * *

"All charges" for service of a common carrier and the method and system under which the same shall be collected are therefore under the supervision and regulation of the commission. The nature as well as the amount of rates, fares or charges are to be determined and put in force.

ANALYSIS OF SEC. 49, AS AMENDED IN 1910

It is to be noted also that while, prior to 1910, Sec. 49 seems to have been drawn primarily with a view of protecting the public from unjust charges, the amendments of that year were intended to safeguard the interests of the railroad corporations as well as of the public, no doubt due to the fact that experience had demonstrated that under a system of strict public supervision by the Public Service Commission brought into being in 1907, the mutual welfare of the public and the railroads required that the earnings of the corporation must be reasonably protected in order to insure adequate service to the public.

The amendment of Subdivision 1 giving power to determine maximum rates with due regard to a "reasonable average return" where the old rates are "insufficient to yield reasonable compensation for the service rendered" is manifestly intended to give the commission power to insure to the corporation adequate revenues and save it from possible bankruptcy.

A similar purpose appears in Subdivisions 6 and 7; the former giving power of changing the practices, service, rules and regulations with respect to transfers which may become unreasonable either to the public or to the railroad corporation, and the latter subdivision making the obligation of the railroad company to give free transfers, which was absolute under the former statute (Sec. 104 of the railroad law), dependent upon the action of the Public Service Commission, in pursuance of the public service commissions law. These changes were all made to give the commission plenary power to protect both the traveling public and the railroad corporations.

This view of Subdivision 1 of Sec. 49 giving the commission complete supervision of rates and charges, including not alone the raising and lowering of old rates but the readjustment of rates involving new rates for particular kinds of service and the elimination of old charges where called for, is consistent with the general scope of the entire section. The second paragraph of Subdivision 1 gives the commission power to fix maximum rates for reduced rate tickets and restore old rates previously discontinued.

Subdivision 2 relates to the service to be furnished by common carriers as distinguished from the charges for such service, reposing with the commission full power of determining "proper regulations, practices, equipment, appliances and service" to be observed and used in passenger and freight transportation.

Subdivision 3 gives the commission complete power to establish through routes and joint rates, fares and charges for the through transportation of passengers and property and to apportion the rates, fares and charges for such transportation among the railroad companies affected, thereby putting under the control of the commission the whole matter of inaugurating through routes and devising a new schedule of joint rates, with the further power of fixing the maximum charges and dividing the receipts according to its judgment among the corporations affected.

Subdivision 4 also relates to through transportation of property, empowering the commission to order the construction of new switch connections, declares the terms and conditions under which such service shall be conducted, and provides for the division of receipts and expenses among the corporations engaged in such service.

Subdivision 5 relates to jurisdiction with respect to joint rates and through routes as between the Public Service Commissions of the First and Second Districts respectively.

From this brief review of Sec. 49 of the public service commissions law the purpose stands forth clearly to place under the control of the Public Service Commission (a) all matters pertaining to safe, adequate and proper regulations, practices, equipment, appliances and service to be observed, used and furnished by the common carrier; and (b) equal jurisdiction over rates, fares and charges to be received by the carrier for the service which the commission may require it to give with complete and plenary power of fixing, adjusting and supervising the entire system of charges and schedules of rates.

The fact that the Public Service Commission is given such sweeping power with respect to service and equipment to be required of the railroad companies compels the conclusion that the commission is given a like power with respect to fares, charges and rate schedules. Any other interpretation would place the commission in the unfortunate position of being compelled either to demand the service and equipment which it deems proper, and thereby endanger the financial integrity of the companies affected by reason of its inability to raise and readjust rates to meet the new requirements, or abandon or limit efforts to require satisfactory public service of the railroads, thereby transferring the burden from the companies to the people, permitting the former to exist and causing the latter to suffer, an unsatisfactory condition for all parties concerned.

BROOKLYN GAS CASE NOT CONTROLLING

The recent decision of former Justice Hughes as referee, in *Brooklyn Borough Gas Company v. Public Service Commission, et al.*, holding that the Public Service Commission cannot, in fixing a reasonable rate for gas, exceed the maximum fixed by a valid statute, and denying the motion of the commission to dismiss the complaint, made upon the ground that the public service commissions law affords an adequate remedy, and an application to the commission for an increase in rates was a condition precedent to an application to a court for relief in the form of a suit to enjoin the enforcement of the statutory rate, does not question the power of the Public Service Commission to authorize railroad charges in excess of statutory rates.

Sec. 72 of the public service commissions law, conferring power upon the Public Service Commission to fix the maximum price of gas or electricity "not exceeding that fixed by statute," is held to contain an express restriction upon the power of the commission with respect to the regulation of rates for gas and electricity in the form of the unequivocal language quoted, which was inserted in Sec. 72 by an amendment in 1910, and which does not appear in Sec. 49, relating to railroad rates.

JUSTICE HUGHES SAYS CASES ARE DIFFERENT

The differentiation of the powers of the commission with respect to the two classes of corporations is made in the following language of the opinion:

"Sec. 72 of the public service commission law provides that 'after a hearing and after such an investigation as shall have been made by the commission, or its officers, agents, examiners or inspectors, the commission within lawful limits, may, by order, fix the maximum price of gas or electricity not exceeding that fixed by statute, to be charged by such corporation or person for the service to be furnished.'

"The decision of the Court of Appeals, affirming the decision of the Appellate Division, upon its opinion, in the case of *People ex rel. Ulster & Delaware Railroad Company vs. Public Service Commission*, 171 App. Div., 607; 218 N. Y., 643, is not applicable here, inasmuch as the sections of the public service commission law there under consideration, which related to railroads, did not contain the explicit provision which I have mentioned as being found in Sec. 72 of the public service commission law relating to the powers of the commission in dealing with companies supplying gas and electricity.

"It will be noted that those words 'not exceeding that fixed by statute,' were not in the public service commission law originally. They were inserted by the amendments of 1910. In other words, at the same time when the Legislature amended the public service commission laws with respect to railroads in the manner pointed out by the court in the case above cited, and also amended that law with respect to gas and electric light companies, it inserted in Sec. 72 these words: 'Not exceeding that fixed by statute.'

"It seems to me that these words are very clear and that they cannot be disregarded. * * *

"No construction of the public service commission law with reference to other provisions of the act, either relating to railroads or relating to gas or electric light companies, can be admissible, as it seems to me, which would destroy the effect of this explicit provision which the Legislature has seen fit to incorporate in Sec. 72."

In the Brooklyn Borough Gas case it is also to be noted that the statute fixing the maximum rate for gas there under consideration was enacted by Chap. 604 of the Laws of 1916, thereby making it a more recent statute than Sec. 72 and the other provisions of the public service commissions law under which the Public Service Commission derived its authority to fix rates. In the present proceeding it is to be borne in mind that Sec. 181 of the railroad law, providing for a 5-cent fare on any street surface railroad or branch thereof within the limits of any incorporated city or village, is a re-enactment of Sec. 101 of the former railroad law, which had been in force for many years prior to 1910, when the Public Service Commission by amendment of Sec. 49 of the public service commissions law was given its present extensive powers over railroad rates and charges and, in fact, for many years prior to 1907, when the public service commissions law was originally enacted. Sec. 49 of the public service commissions law must therefore be deemed a later statute than Sec. 181 of the railroad law under the rule prescribed by Sec. 95 of the general construction law, which provides as follows:

"The provisions of a law repealing a prior law, which are substantial re-enactments of provisions of the prior law, shall be construed as a continuation of such provisions of such prior law, modified or amended according to the language employed, and not as new enactments."

Discussion on Coasting Recorders

Among the subjects discussed at a meeting of Stone & Webster operating men at Fort Worth, Tex., on March 28, was that of coasting recorders, which are now used on several Stone & Webster properties and have been ordered for others. It was pointed out that, in addition to energy savings, the coasting recorder had produced other benefits of equivalent value.

Some of those present thought that motormen who were anxious to obtain high coasting records would be liable to operate recklessly, thereby abusing equipment, distorting schedules and increasing accidents. However, others who had had experience with the coasting recorder stated that it had actually cut down the cost of maintaining electrical equipment, saved wheel wear and brakeshoes, promoted closer operation to schedules, more uniform speed and fewer and less serious accidents. The fundamental reason for this improvement lay in the fact that in order to make a high coasting percentage the motorman must be ever alert. This alertness does more than lead him to seize coasting opportunities, since it keeps the motorman on the lookout to make his time points and to avoid accidents. A still further advantage was that a large coasting percentage might be an indication of a slow schedule. In following this up some companies had been able to increase schedule speed, thereby making a saving in the number of cars operated.

Last, and really most important, was the feeling that if the desired advantages are to be obtained it is necessary for the entire organization to understand the principles of coasting, combined with a thorough instruction and follow-up system.

Effect of War in British Columbia

The British Columbia Electric Railway has found that the war has had no appreciable effect upon the company's personnel. Although a large number of men have enlisted, the standard of efficiency has been well maintained in the numerous classes which require skilled labor. Approximately 21 per cent of the company's employees have left the service to join the military or naval forces, or have taken up the manufacture of munitions. Their places have been filled—until they return, or for the duration of the war—by temporary help. The company's records show that the enlistments for military service among the various branches of the company's employees are as follows: Platform men, 19 per cent; shopmen, 13 per cent; electricians, 20 per cent. In connection with the last mentioned it may be noted that this includes substation operators, from which particular class the largest percentage of enlistments occurred, no less than 36 per cent of the company's substation men having joined the colors for service overseas.

New York Committee on Higher Fares Meets

A meeting of the full committee on higher fares of the New York State electric railway companies was held at 8 West Fortieth Street, New York, on the afternoon of June 20. The meeting was devoted to a discussion of ways and means of bringing the need of higher fares before the commissions and people of the State.

COMMUNICATIONS

Steel Trolley Wire on City Lines

MINNEAPOLIS STREET RAILWAY COMPANY

MINNEAPOLIS, MINN., June 14, 1917.

To the Editors:

By way of discussion of the use of steel contact wire, as described in the article by S. H. Anderson, appearing in the issue of the ELECTRIC RAILWAY JOURNAL for June 9, 1917, page 1038, the following points may be of interest:

I believe that the use of steel trolley wire depends greatly upon the service requirements of the line and locality. While its use might prove a success on a system such as the Pacific Electric Railway, with heavy interurban service, I believe that many objections would arise to the use of this material on city streets with heavy single-car local service, particularly where the city requirements demand underground feeder supply and prohibit the use of overhead auxiliary mains. It would seem entirely out of the question to provide trolley taps every 400 ft. from an underground feeder, both on account of the difficulties of providing such taps and also on account of the necessity of greatly extending the underground feeder system.

Our experience shows a much greater wear on the trolley wire at hangers and other attachments even with the most flexible support, and from observation I believe that this extra wear is more a result of flashing and burning than mechanical wear. A remedy for this may be found in the use of a sliding contact in place of the trolley wheel. Some experimenting done along this line indicates that the arcing is greatly reduced by the sliding contact. Also a sliding contact may be operated with much less pressure on the wire than with the rolling contact, which fact tends to lessen the damage of crystallization by the pounding of the trolley.

If this extra wear on copper trolley wire at point of attachments could be eliminated by use of a sliding contact, the arguments for using steel trolley wire would be greatly reduced. E. H. SCOFIELD,
Engineer of Power and Equipment.

BOARD OF SUPERVISING ENGINEERS
CHICAGO TRACTION

CHICAGO, ILL., June 19, 1917.

To the Editors:

I have read the article by S. H. Anderson in the issue of June 9 concerning the use of steel trolley wire by the Pacific Electric Railway. In general this article does not cover the use of steel wire for city service, and while I have very little doubt as to its utility for interurban service or for steam railroad electrification, I am not enthusiastic concerning its use for city service, although I have had no personal experience with it. I think we might expect pitting of the wire at accelerating points, and I believe that this difficulty, which is in existence with ordinary trolley wire, will be increased when the contact is between dissimilar metals, such as steel wire and the composition trolley wheel.

In heavy city service practically all points on the line are accelerating points, as the regular service stops are so numerous and other emergency or necessary stops practically make the entire line subject to much pitting action. Furthermore, on city lines it is difficult to keep the pressure of the trolley wheel on the wire at a constant value, due to fluctuating heights of wire on account of subways under railroad elevations, grade crossings and bridges. The lower conductivity of the steel wire makes further feed-in points necessary. Such points are numerous enough at present and the addition of more such points would add to the expense and the difficulty of maintenance.

The article in question indicates the use of such wire chiefly for catenary construction, and for such purpose I believe it would be highly satisfactory.

For the reasons stated, I believe that the utility of the use of steel trolley for direct suspension work in city service is open to question. RALPH H. RICE,
Principal Assistant Engineer.

A Day's Labor in Four Tons of Coal

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

WASHINGTON, D. C., June 18, 1917.

To the Editors:

I am very glad to learn of the efforts which you are exerting to persuade the electric railways to attain all practicable economy in the use of fuel. If the users of coal can be brought to realize that every 4 tons of coal has required a day's work of one man in the mining industry and has utilized a proportional amount of the energy of the railroads, I believe that much will have been accomplished for the efficiency of the nation in this crisis. PHILIP S. SMITH, Acting Director.

AMERICAN ASSOCIATION NEWS

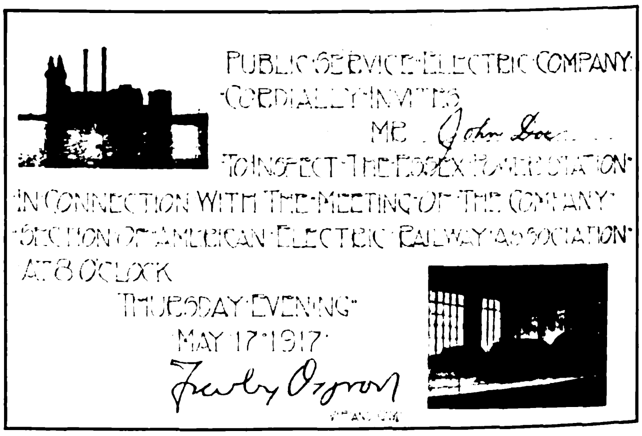
Coming Committee Meetings

A meeting of the executive committee of the American Association will be held at the association office in New York on June 26 and 27. At that time it is expected that all matters connected with the meeting in the fall will be settled.

On Wednesday, June 27, there will be a meeting of the executive committee of the Engineering Association.

Public Service Section

In connection with the inspection of the Essex power station of the Public Service Electric Company, described in the issues of this paper for May 26, page 962, and June 9, page 1040, the Electric Company sent out the invitation reproduced above. It was handsomely printed on large cards well worthy of framing.



PUBLIC·SERVICE·ELECTRIC·COMPANY·
·CORDIALLY·INVITES
MR. John Doe
·TO·INSPECT·THE·ESSEX·POWER·STATION·
·IN·CONNECTION·WITH·THE·MEETING·OF·THE·COMPANY·
·SECTION·OF·AMERICAN·ELECTRIC·RAILWAY·ASSOCIATION·
AT·8·O'CLOCK
·THURSDAY·EVENING·
·MAY·17·1917·
Farley Osgood

INVITATION TO POWER PLANT INSPECTION

Practical and Economical Solutions of Problems in

EQUIPMENT AND ITS MAINTENANCE

Every live shop, track, line and power plant man is doing something that others would like to know about. Such men have a splendid opportunity to assist the industry by notifying the editors of this paper of new things that have been done. Information may be sent in the form of rough notes or short articles, and special rates will be paid for all accepted material.

Track and Paving Construction in Seattle, Wash.

BY S. E. GOODWIN
Senior Inspector, Department of Public Utilities

In Seattle there are in general use but two types of pavement, brick and asphalt, on permanently improved street railway rights-of-way. The railway companies are obligated to improve their rights-of-way with the same pavement as is used by the city on each side of the tracks. In practically all streets on which traffic is light and the grade easy, asphalt has been used because of its smoothness, its cheapness and the short time required to harden after having been laid. Brick pavement has, however, proved most satisfactory in Seattle, complying, as it does, with the three essentials, smoothness, good wearing qualities and ability to withstand rail vibrations. A most important factor in a good brick surface is, of course, the quality of the brick itself. In this respect Seattle is fortunate in having within its limits a manufacturer of a particularly excellent paving brick.

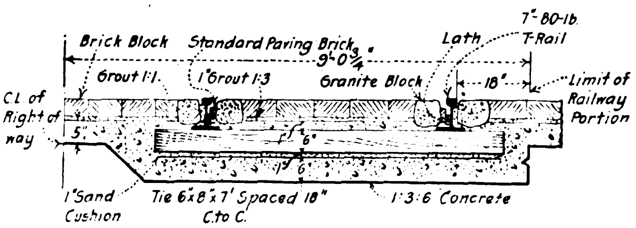

7"-80-lb. T-Rail
Brick Block
Standard Paving Brick
Lath
9'-0¾"
Grout 1:1.
1" Grout 1:3
Granite Block
18"
Limit of Railway Portion
C.L. of Right of way
5"
6"
1"
6
1" Sand Cushion
Tie 6"x8"x7' Spaced 18" C. to C.
1:3:6 Concrete

FIG. 1—COMBINATION PAVING, USING BRICK AND GRANITE BLOCK

Granite block pavement has been used on some streets of heavy grade and has given good satisfaction. None of this type has been installed during the last six years, however, although the Puget Sound Traction, Light & Power Company has in a number of cases employed granite block in combination with brick or asphalt as shown in cross-sections Figs. 1 and 2. The advantage of this type of construction is that the portion subjected to the greatest amount of wear and rail vibration is best adapted to withstand destructive forces.

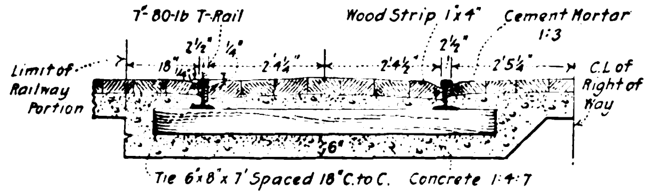

7"-80-lb T-Rail
Wood Strip 1"x4"
Cement Mortar 1:3
2½"
¼"
2½"
Limit of Railway Portion
18"
2'4¼"
2'4½"
2'5¼"
C.L. of Right of Way
6"
Tie 6"x8"x7' Spaced 18" C. to C.
Concrete 1:4:7

FIG. 3—WOOD-BLOCK WITHOUT SAND CUSHION

Wood-block pavement, though still in the experimental stage in Seattle, will in all probability be used to a much greater extent in the coming years as it has met with general approval. It is noiseless, sanitary, durable, easily repaired and can be laid by the railway company's own construction force. The local standard for wood-block paving is shown in Fig. 3. It will be noticed that no sand cushion is provided under the blocks. The top of the concrete is smoothed with a ¾-in. layer of 1:2 cement mortar which, after setting, is painted with hot asphaltum and the wood blocks are laid immediately thereon.

The cross-section in Fig. 4 is of the type of pavement used on Second Avenue after the track reconstruction. The tracks on this street were originally laid in 1895 with high 72-lb. T-rails and brick paving. As this is one of the most heavily traveled streets in the city it was requisite to provide as good a type of pavement construction as possible. In the reconstructed track the rails are of grooved type, 116 lb. per yard and 7 in. in height, this type being in use on only one other line in the city, the Municipal Railway. The rails are supported on creosoted fir ties and special combination tie plates, with rail braces at every fifth tie. On account of the shape of the rail the center of bearing does not fall in line with the center of gravity, and were it not for the braces there would be a pronounced tendency for the rail to tip outwards. Screw spikes are used to fasten the rails to the three ties on each side of each joint, ordinary spikes holding the intermediate ties. The joints are of the continuous type except in the west track between University and Seneca Streets, where Wightman joints are used.

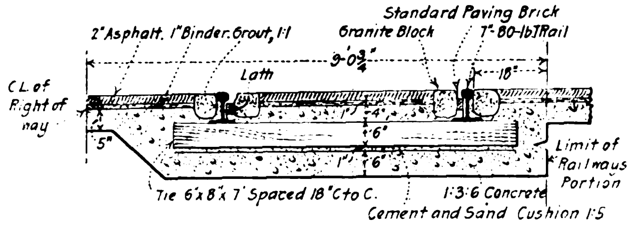

Standard Paving Brick
2" Asphalt. 1" Binder. Grout, 1:1
Granite Block
7"-80-lb T Rail
9'-0¾"
Lath
18"
C.L. of Right of way
1"
4"
6"
5"
1"
6"
Limit of Railways Portion
Tie 6"x8"x7' Spaced 18" C to C.
1:3:6 Concrete
Cement and Sand Cushion 1:5

FIG. 2—COMBINATION PAVING, USING ASPHALT AND GRANITE BLOCK

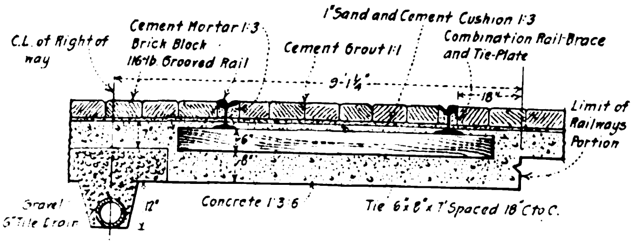

1" Sand and Cement Cushion 1:3
Cement Mortar 1:3
C.L. of Right of way
Brick Block
116-lb Grooved Rail
Cement Grout 1:1
Combination Rail-Brace and Tie-Plate
9'-1¼"
18"
Limit of Railways Portion
7"
6"
8"
Gravel
6" Tile Drain
12"
Concrete 1:3:6
Tie 6"x8"x7' Spaced 18" C to C.

FIG. 4—TRACK CONSTRUCTION ON HEAVILY-TRAVELED BUSINESS STREET

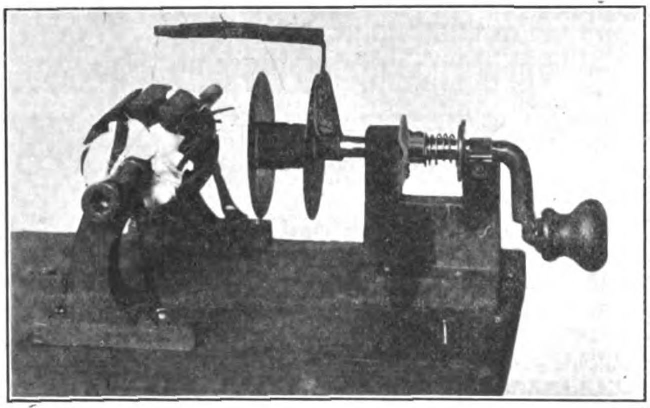
Under the center of each track and under each rail are twisted reinforcement rods embedded in the 8-in. concrete base. A ⅜-in. x 2-in. flat tie rod is placed on each side of the track joints. The concrete is proportioned 1:3:6 and the type of mixer used allows it to be poured directly into place. Under the center of the right-of-way is a 6-in. tile drain laid with open joints and embedded in gravel.

These tracks were reconstructed by the Stone & Webster Engineering Corporation and the work was so executed as to cause minimum impedance to the progress of the contractor paving the city's portion.

Winding Heater Motor Armatures

The armature winder in the Des Moines City Railway shops has built a crude but effective machine for winding the armatures of the small heater fan motors. A small bobbin for the wire is placed on a crankshaft, as seen in the photograph herewith, which is set on a block at right angles to the armature being wound. The wire feeds from this bobbin up onto an arm projecting over the armature and off this arm in line with the proper slot in the armature.

As the crank is turned and the arm approaches the armature shaft, a small cam mounted on the crank block pulls the crankshaft back so that the winding arm will pass by the armature shaft and then a small coil spring forces the arm back in line with the opposite slot of the armature, and so on. This cam is simply a washer with a hump bent into one side and fastened to the wooden block as shown. A steel bushing fastened to the shaft is held against this washer by a spring, and when it strikes the hump it is forced back and carries the shaft with it. Proper tension is given the wire by a small flat steel spring on top of the winding arm which presses the wire against the bottom of the arm as it is fed through. By the use of this ingenious device the winder has only to turn the crank and count the number of turns.



HOME-MADE DEVICE FOR WINDING HEATER MOTOR ARMATURES

Simplified System for Stockroom Storekeeping

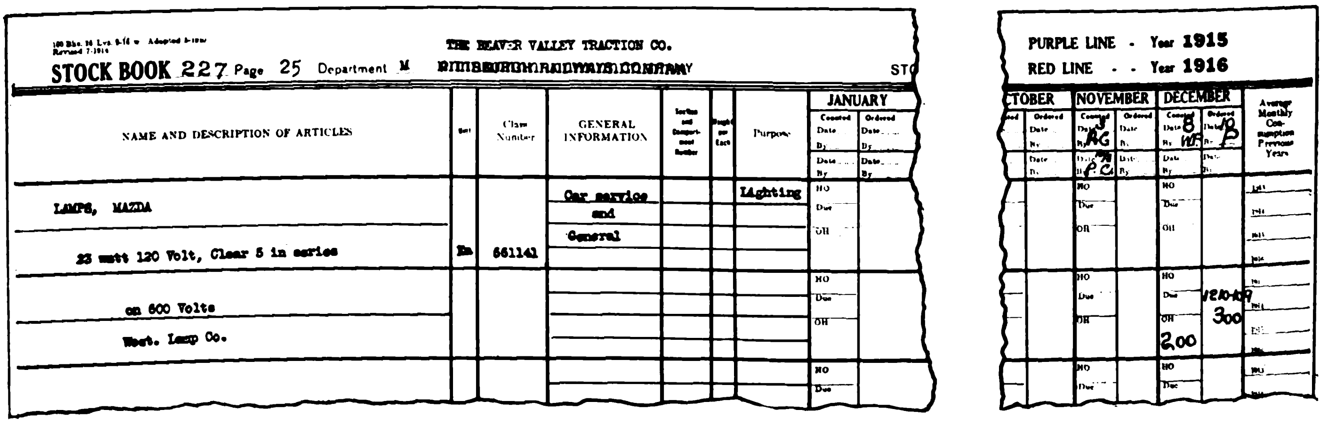
Storekeeping Methods Maintained by the Beaver Valley Traction Company of New Brighton, Pa., Are Efficient and Complete

BY W. D. PIERI
Storekeeper for the Beaver Valley Traction Company

Our stock book, in which every item of material in stock is listed, is the most important record of the stores department, and I might say that it is of the same form as shown in an article which appeared in the March 17 issue of the ELECTRIC RAILWAY JOURNAL. It shows the exact location of the bins or compartments in which the material is located, the amount of material on hand, the quantity on order, and the purchasing requisition number of all items ordered. It also gives an exact description of each item, giving the class or lot number, the exact movement of all stock items from month to month, and from this record an average monthly consumption is easily determined. The terms HO, Due, and OH, found under each monthly column, indicate respectively quantity for which orders are being held, quantity due on previous requisitions or shop orders, and quantity on hand. The books are thus kept up to date and will show any obsolete or surplus material which may be on hand.

Once a month stock is taken and, in order to ascertain the quantity still due on uncompleted orders, the stock books are checked for all back orders that have been received. Material is then ordered based on the monthly consumption, and any new construction work to be provided for.

To illustrate the system to the best advantage to the reader, we shall trace an item from the time it is ordered until it is put into use, showing the various forms used in the stores department. In going over the stock books (Fig. 1) it is seen that we are in need of some 23-watt Mazda lamps. A purchasing order material requisition blank (Fig. 2), is made out in duplicate, showing the quantity on hand, quantity due and quantity wanted; and also a description of the material, lot number and purpose for which it is to be used. After being approved, the original copy is forwarded to the purchasing agent, the duplicate filed, and the requisition number and quantity ordered are posted in the stock books (Fig. 1). The purchasing agent returns a storekeeper's memorandum (Fig. 3), which is an exact copy of the material requisition, and also gives the order number, date and firm from which the material was ordered. The memorandum is checked with the duplicate material requisition, and the date, order number and firm's name are posted on the duplicate requisition, which is on file. This helps to check any duplica-



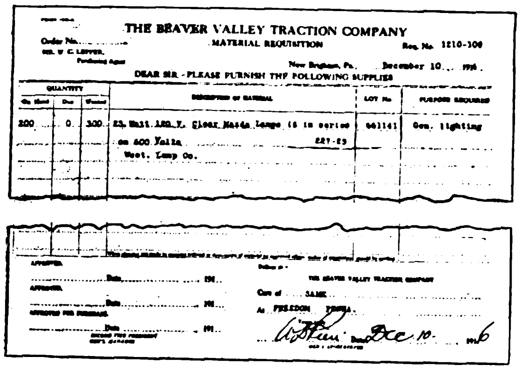
THE BEAVER VALLEY TRACTION CO.
STOCK BOOK 227 Page 25 Department M ~~PITTSBURGH RAILWAYS COMPANY~~

NAME AND DESCRIPTION OF ARTICLES	Unit	Class Number	GENERAL INFORMATION	Section and Compartment Number	Weight per Each	Purpose	JANUARY Counted Date By / Date By	JANUARY Ordered Date By / Date By
LAMPS, MAZDA 23 watt 120 Volt, Clear 5 in series	Ea	661141	Car service and General			Lighting	HO Due OH	
on 600 Volts West. Lamp Co.							HO Due OH	
							HO Due	

PURPLE LINE - Year 1915
RED LINE - - Year 1916

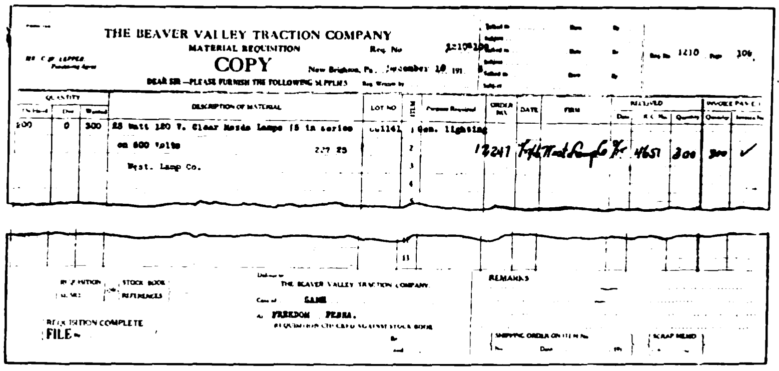
OCTOBER Counted	OCTOBER Ordered Date By / Date By	NOVEMBER Counted	NOVEMBER Ordered Date By / Date By	DECEMBER Counted	DECEMBER Ordered	Average Monthly Consumption Previous Years
		Date 3 By RG Date By P.C.		Date 8 By WR Date By	Date 10 By P Date By	
		HO Due OH		HO Due OH		
		HO Due OH		HO Due OH 200	1210-109 300	
		HO Due		HO Due		

STORE KEEPING—FIG. 1—STOCK BOOK PAGE, SHOWING MONTHLY RECORD OF NEW, OLD AND SCRAP MATERIAL


THE BEAVER VALLEY TRACTION COMPANY
MATERIAL REQUISITION
Order No.
Req. No. 1210-100
Mr. W. C. Lepper, Purchasing Agent
New Brighton, Pa., December 10, 1916.
DEAR SIR—PLEASE FURNISH THE FOLLOWING SUPPLIES

On Hand	Due	Wanted	Description of Material	Lot No.	Purpose Required
200	0	300	23 Watt 120 V. Clear Mazda Lamps (5 in series on 600 Volts 227-23 West. Lamp Co.	661141	Gen. lighting

Approved .... Date .... 191..
Approved .... Date .... 191..
Approved for purchase .... Date .... 191..
Deliver to THE BEAVER VALLEY TRACTION COMPANY
Care of SAME
At FREEDOM PENNA.
W. Flern Date Dec 10 1916


THE BEAVER VALLEY TRACTION COMPANY
MATERIAL REQUISITION
COPY
Req. No. 1210-100 Req. No. 1210 Page 106
Mr. C. W. Lepper, Purchasing Agent
New Brighton, Pa., December 10 191
DEAR SIR—PLEASE FURNISH THE FOLLOWING SUPPLIES

On Hand	Due	Wanted	Description of Material	Lot No.	Item	Purpose Required	Order No.	Date	Firm	Received R. C. No.	Quantity	Invoice Passed Quantity	
200	0	300	23 Watt 120 V. Clear Mazda Lamps (5 in series on 600 Volts 227 23 West. Lamp Co.	661141	1	Gen. lighting	12247		West. Lamp Co.	4651	300	300	✓

Deliver to THE BEAVER VALLEY TRACTION COMPANY
Care of SAME
At FREEDOM PENNA.
REQUISITION COMPLETE
FILE
REMARKS

STORE KEEPING—FIG. 2—MATERIALS REQUISITION BLANK. FIG. 3—STOREKEEPER'S MEMORANDUM BLANK

tion of the order, and checks any error that might be made in the purchasing department.

When the material arrives at the storeroom it is checked by the receiving clerk, and a receiving card (Fig. 4) is made out in duplicate, showing the firm, date received, order and requisition numbers, quantity description of material, lot or class number, how received, and condition of material when received. The receiving card number, date and quantity received are shown in their proper places on the duplicate copy of the material requisition blank on file. This enables the storekeeper to check at once any duplicate shipment on this order. The duplicate copy of the receiving card is filed. After checking the material received with its requisition blank, a description tag (Fig. 5) is made out showing receiving card number, class number, date received, quantity, order number, requisition number, firm purchased from, and a description of the material. The material is then put away in its proper bin or compartment. The receiving card is posted in the ledger under the class number and the material shown is ready to be requisitioned out.

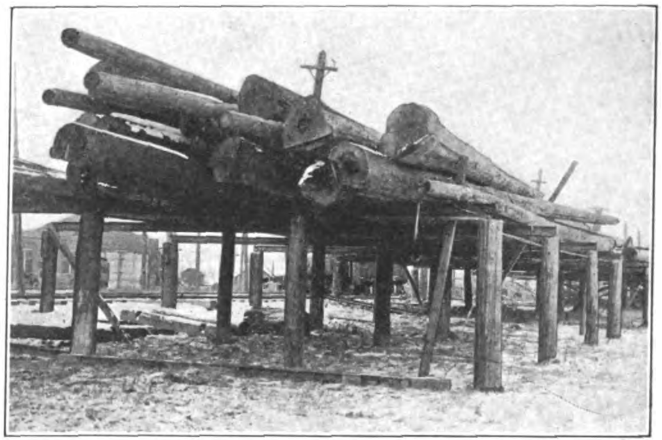
Material is given out of the storeroom on requisition only. Requisition books, having requisitions (Fig. 6) in duplicate, serially numbered, are furnished the foremen and heads of departments and all requisitions must be accounted for. They show the purpose for which the material is to be used, the quantity wanted, description of material, and the lot number and account to which it is to be charged, being placed thereon by the stores department. They also show to whom the material was given. This requisition is then forwarded to the auditing department for posting.

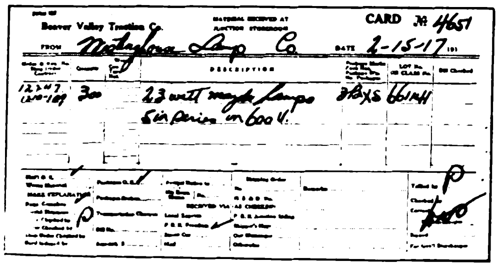
We require that all invoices for material purchased be furnished in triplicate. After the material has been received, and the invoice checked and approved for payment, the original and duplicate copies are forwarded to the auditing department. The triplicate copy is stamped by the storekeeper, and the blanks (Fig. 7) filled in to show the date material was received, receiving card number, checked "O. K." for payment, and the date on which the invoice was passed for payment. This triplicate copy of the invoice is filed in the storeroom, thus saving the expense and trouble of keeping a card file and index of the above information.

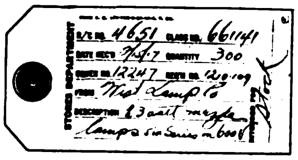
The system as described enables the company to have a record on hand at all times of the full transaction for all material purchased and received.

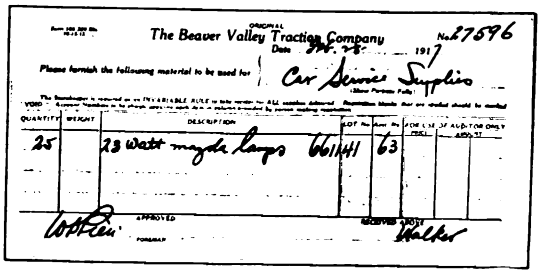
Storing Poles for Easy Loading

The Western Ohio Railway has built a pole storage at Wapakoneta, Ohio, adjacent to its right-of-way, which greatly facilitates the loading and unloading of poles from and into storage. This arrangement consists of a number of piles driven into the ground, with old girder rail laid across the top of them to form a support on which the poles can be rolled. This places the poles on about the same level above the ground as the flat cars used in hauling them. It is therefore a very simple matter to lay short pieces of rail from the piles nearest the track across to the car floor and roll the poles from the storage structure to the car. Also, by storing the poles in this elevated position they are kept up out of the moisture from the ground and the free circulation of air around them retards rotting.


POLE STORAGE STRUCTURE ON AN OHIO ELECTRIC LINE

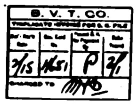

Beaver Valley Traction Co.
CARD № 4651
From Westinghouse Lamp Co. Date 2-15-17
12247 1210-109 300 23 watt mazda lamps 5 in series on 600 V. 3 Bxs 661141
Tallied by P
Checked by


STORES DEPARTMENT
R/C No. 4651 Class No. 661141
Date Rec'd 2/15/17 Quantity 300
Order No. 12247 Req'n No. 1210-109
From West Lamp Co
Description 23 watt mazda lamps 5 in series on 600 V


ORIGINAL
The Beaver Valley Traction Company №27596
Date Feb. 28 1917
Please furnish the following material to be used for Car Service Supplies

Quantity	Weight	Description	Lot No.	Acct. No.
25		23 Watt mazda lamps	661141	63

Approved W. Flern
Foreman
Received by Walker


B. V. T. CO.
TRIPLICATE INVOICE FOR O. K. FILE

2/15	4651	P	2/1

CHARGED TO

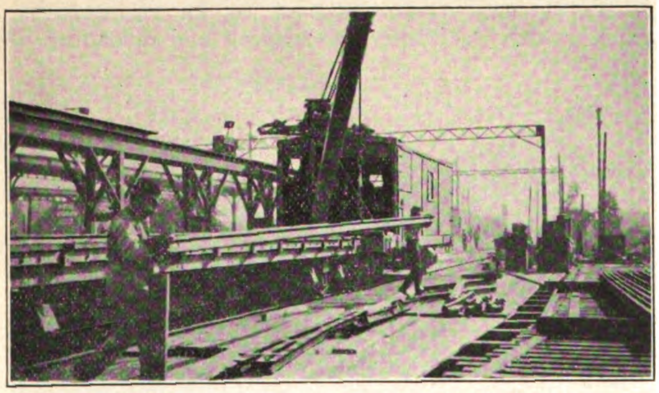
STORE KEEPING—FIG. 4—RECEIVING BLANK. FIG. 5—DESCRIPTION TAG. FIG. 6—REQUISITION BLANK. FIG. 7—INVOICE STAMP

Locomotive Cranes of Pacific Electric Railway

The Author Describes the Crane Equipment Used by This Company and the Work That Is Done with It

BY CLIFFORD A. ELLIOTT
Cost Engineer Pacific Electric Railway, Los Angeles, Cal.

The first electric crane purchased by the Pacific Electric Railway was placed in service in January, 1913. It was a 60-ton wrecking crane built by the Industrial Works of Bay City, Mich., and it has given valuable service in rerailing box cars and freight motors in several minor freight train wrecks. This crane has also served advantageously and economically in setting steel bridge girders, placing riprap rock at bridge approaches and along banks of streams for flood control, and setting railroad crossings and other heavy special-work layouts in place, as well as in the material store yards in loading and unloading rail and various classes of heavy material. The boom can be operated through a complete circle, whereby "bad-order" carloads of rail received at the yards are often transferred with dispatch by swinging the rail from the "bad-order" car to another car placed immediately in the rear of the crane on the same track. Sorting of a car of miscellaneous track material has also been accomplished by the same method. Recently the company erected with its own forces one of three proposed divisional carhouses and store track layouts. The timber trusses, bays and framework were erected in form on the ground and then placed in final position with the crane, this economical manner of handling the work effecting a great saving.

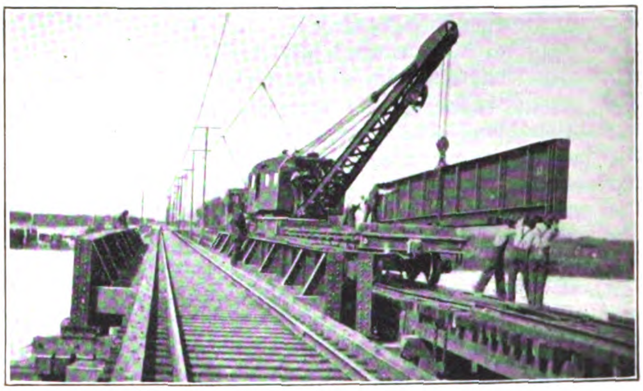


SHOP-BUILT CRANE USED BY MAINTENANCE-OF-WAY DEPARTMENT

In consequence of the successful operations of this first crane equipment, it was deemed expedient during the year 1915 to place in service a lighter capacity crane for doing rapid work in the various municipalities on the Pacific Electric Lines where traffic congestion, restrictive ordinances and undesirable conditions made it impractical to operate the larger crane. An obsolete 60-ton Vulcan steam shovel, with its swinging gear and hoist but without its steam propelling equipment, was rebuilt for the purpose, the boilers being removed and electric driving motors installed. This shop-built crane is of 5 tons capacity. The boom has a 30-ft. radius, and a vertical rise of 25 ft. is obtainable without obstruction of the trolley, or 18-ft. when the trolley interferes. An idler car is always included as part of the crane equipment, as is also a full set of track tools. Six 600-lb. scrap car wheels are carried on the back of the car as a counter weight. The total gross weight of the crane and equipment is 91,000 lb., and because the operating motor is set well back in car the balance is well maintained.

Since this crane was placed in service, a second rebuilt equipment of similar type has been provided for the exclusive use of the store department at the company's material yards, thus permitting the first shop-built crane to remain constantly in the maintenance of way department. This has resulted in more efficient work and elimination of interference to the department's maintenance programs, which have suffered through loaning the crane at times for the store department's work. The crane in the service of the store department is of only 3 tons capacity because it has a 36-ft. boom and a limited counterbalance. The extra length of boom required by the store department is for handling long steel and wooden trolley poles, rail of 50-ft. and 60-ft. lengths, and miscellaneous other material.

The Pacific Electric is constantly devising original methods of handling various classes of work for the cranes, whereby the cost of the work may be reduced to the minimum, and the element of dispatch in so handling the work is of the highest order. When this company recently constructed its new overhead viaduct in the rear of its Main Street terminal, two tracks existed on a portion of the old viaduct which could not be taken out of service while rearranging special work of the new layout. With the cranes the new special work was installed and old layouts were relocated while traffic was stopped, within a minimum time and with very little delay to train operation. In addition all track material for new tracks on the viaduct was unloaded with much rapidity.



PACIFIC ELECTRIC WRECKING CRANE PLACING BRIDGE GIRDER

The maintenance of way department maintains several branch material assembly yards at various points on the lines. At the most centrally-located yard a large stationary electric motor-driven rail bender is operated, designed particularly for curving the tee and girder sections of rail used in city paved streets. The rail is shipped to this yard and the crane unloads each rail separately. Then when it is curved by the rail bender, the rail is returned by the same operation to the same car or another car for shipment to the various jobs. Thus there is a considerable saving in time, labor and handling cost.

Recently the company performed a large job of grading for removal of a bluff to provide ground for one of its new divisional carhouses. After graders and steam shovel crews had left the work, the crane was used in leveling down the slope. A wooden slip was attached by a chain, and the boom of the crane adjusted so as to drag the slip over the graded area, thus performing cheaply a task that would have been difficult and tedious if attempted by manual effort.

The way department crane has been found of great aid in reconstruction work on single-track lines, where service is frequent and it is undesirable to detour traffic. After the 50-ft. lengths of rail are distributed with the crane alongside the track, a regular rail fork is attached to each rail in the center and the track men attach one pair of continuous joints, inserting only one bolt to secure it temporarily. Then the crane lifts the rail, setting it in place on spaced ties, while twenty track laborers immediately spike the rail and bolt the joints. The entire transaction consumes five minutes for each rail length handled. Since the length of crane boom is 30 ft., the 50-ft. rail lengths are conveniently handled.

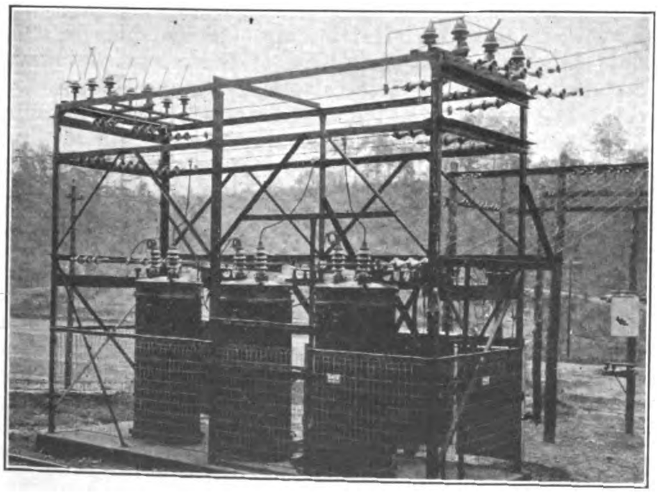
When the company's bridge and building department completes reconstruction of pile trestles, the crane serves in following the work and picking up scrap bridge timbers and piling, and gives the same service in unloading new material for the repair work of this nature. During the heavy spring rains each year there have been several seasons when severe floods occurred and considerable damage was done. In such cases the crane gives excellent emergency service in quickly reaching the various bridges on the lines and it is utilized in placing boulders to obstruct the flood waters from overflowing streams, thus preventing the waters changing their course and seriously damaging the tracks or disrupting operations of the lines. At the same time the crane is used in removing large obstructions that may have been washed up against bridges and are likely to cause extensive damage unless removed at once.

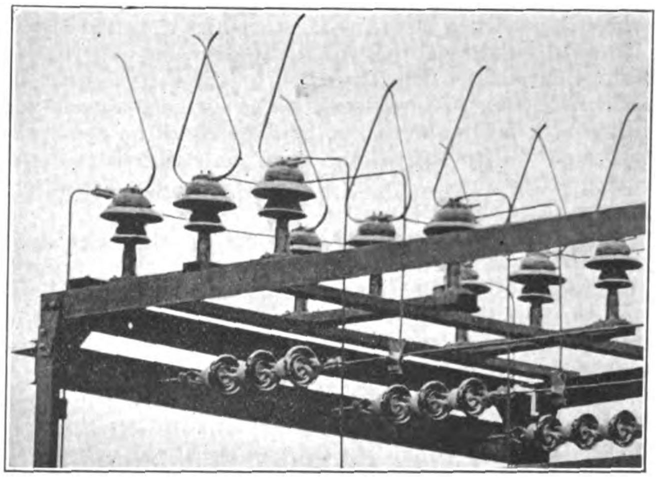
On the double-track construction of the Pacific Electric crossovers are frequently relocated from ¼ mile to 1 mile or more farther up or down the line. The expense of relocating these facilities has been lessened one-half, as compared with former practice, and the quickness of making such changes minimize delays to traffic.

Georgia Railway & Power Company's Home-Made Outdoor Substations

About five years ago the Georgia Railway & Power Company began the installation of outdoor substations of its own design, using horn-gap lightning arresters, switches, and similar apparatus of its own special design and manufacture.

The accompanying illustration shows a substation at Cartersville, Ga., which is typical of the substations being built by the company. This is a three-phase, 60-cycle station with three General Electric 38,000/2300-volt transformers. The insulator pins are made of paraffined locust, which is the company's standard, and they are securely held in place by means of a split casting which firmly clamps the lower part to the pin. Care is taken to anchor the lines directly to the framing so that the side strain on the pins does not exceed 600 lb. The insulator cap and pin are removable, so that by making proper jumper connections insulators can be replaced without opening the circuit. Also, unlike standard apparatus, the transformer taps can be changed to raise and lower the voltage without shutting down the station.


OUTDOOR SUBSTATION WITH HOME-MADE CONSTRUCTION


HOME-MADE INSULATOR PINS AND HORN GAPS

During 1916 the company built substations of the kind described above at the rate of about one a week.

Operating Rotaries Without Compounding on a 1200-Volt Heavy Railway

BY E. R. CUNNINGHAM

Electric Superintendent Oregon Electric Railway, Portland, Ore.

Contrary to usual interurban practice, we operate our rotary converters as shunt-wound rotaries, without any compounding. We find this method of operation desirable for several reasons. Our system is quite different from the ordinary interurban railway as it is not operated in accordance with interurban practice, but just like a steam railroad, and by steam railroad officials. Thus, cars are never run singly on our lines, but in trains of from two to ten cars each, the average train consisting of about three 50-ton cars, with five to seven-car trains very common. About the only difference between our method of operation and that of a steam line is that since we use electricity, power can be applied to from 50 per cent to 75 per cent of the axles in the train, making the acceleration much faster than with either a steam or electric locomotive.

Five of the eight substations, which furnish power to about 175 miles of main-line track, have but one 500-kw. rotary each. The excessive swings on these stations incident to the rapid acceleration of a heavy train near the station makes it very desirable to operate the rotaries with a drooping characteristic. In our case this could best be obtained by cutting out the compound windings altogether and operating the converters shunt wound. Inasmuch as there are never more than two or three trains pulling on any one substation at a time, and usually but one train, we do not find it any disadvantage to allow the voltage to drop slightly at the substation when heavy trains are starting near it. On the contrary, we find that it is a great advantage for the reason that when a train is starting, it is necessary either to cut down the voltage by means of grid resistors carried on the train, or to allow it to drop at the substation. There seems to be no good reason for carrying a large amount of grid resistors on the train to reduce the voltage at the same time that it is being raised at the substation by means of compound winding, if such windings are used.

Moreover, by allowing the voltage to drop slightly at the near station, the two adjacent substations are enabled to help by picking up a part of the load. With the compound windings cut in on rotary converters or on motor-generator sets under like conditions, the substation which is overloaded tends to boost the voltage. Not only will it then carry all the load on the line, but it will actually tend to pick up the adjacent stations and motor them unless knocked off the line by the overload—which is usually the case. We considered it far better, and results have demonstrated that we were right, to allow the voltage to drop at the station where the overload occurs, so that the station will stay on the line and deliver its full rated capacity at a reduced voltage, instead of going off the line entirely and not carrying any part of the load. Since cutting out the compound windings, flashovers have been eliminated almost entirely. The effects of a flashover, when one does occur, is greatly minimized, for the reason that the field excitation drops as a result of the short-circuit. Furthermore, the flashover is not nearly as vicious or destructive as it would be if the excitation was held up by the series winding, which would be the case if it were cut in.

We have also grounded the frame of our rotaries through a limiting resistance to minimize the destructive effect of flashovers. Before these changes were made, we found that the flashovers on our 1200-volt rotaries were most destructive.

How to Burn Anthracite Buckwheat Instead of Bituminous Coal in a Small Railway Plant

In a recent investigation of the power plant of the Concord, Maynard & Hudson Street Railway at Maynard, Mass., Prof. Edward F. Miller of the Massachusetts Institute of Technology outlined the methods to be followed in burning buckwheat instead of soft coal in the boiler installation. The boilers are of the Aultman-Taylor type, each having about 56 sq. ft. of grate surface and a rating of about 230 hp. Experience at the old power plant of the Institute in Boston indicated a large saving by burning buckwheat at times of moderate load. Professor Miller pointed out that in order to burn buckwheat at the Maynard plant it would be necessary to reduce the area of the openings through the grate and to provide a forced draft to furnish air under pressure to the ash pit.

This draft should be varied according to the depth of the fire and should be so regulated that the pressure over the fire is just about atmospheric. There would be no difficulty in burning 20 lb. of coal per square foot of grate area per hour, and a maximum of 28 lb. could be attained. At this higher rate of combustion there would be required 1 in. or 1¼ in. of air pressure on the discharge side of the blower. The evaporation of water per pound of buckwheat coal is about 8 lb., and from 2 to 2½ per cent of the steam would be taken by the fan engine. In winter this steam could be exhausted into the heating system.

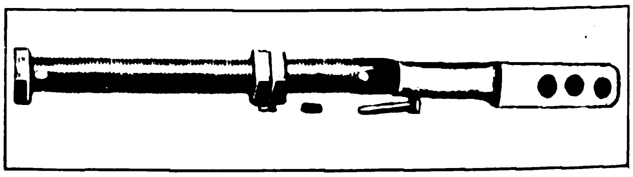
Each boiler burning about 20 lb. of coal per square foot of grate per hour and evaporating about 8 lb. of water per pound of coal would develop about 299 hp. The amount of air required for the two boilers when each is developing 299 hp. would be about 10,200 cu. ft. per minute, and a 5-hp. engine would be required for the fan. The discharge from the fan would be brought down through the side of the setting into the ash pit with a damper in the discharge pipe close to the boiler. It is necessary, Professor Miller pointed out, for the fan engine to have a steam valve between the governor and the boiler controlled by a damper regulator operated by the boiler pressure. A ¼-in. by-pass around the throttle makes it possible to keep the fan engine turning slowly, even though the damper regulator may have cut off the main steam supply to the engine. This prevents the stalling of the engine on the center.

Steam is supplied from the boilers to the heating system in the carhouse. About 5000 ft. of 1¼-in. pipe are installed and the estimated heating surface is 2170 sq. ft. of radiation. It is assumed that ½ lb. of steam per hour is condensed per square foot of heating surface, or 1185 lb. per hour, including a small building with 200 sq. ft. of radiating surface. Were this 1185 lb. of condensate to be returned to the boiler room at a temperature of 200 deg. there would be a saving of 140 B.t.u. per pound of water if the feed water taken in from the outside were at 60 deg. It was estimated that this return of condensate would save 432 lb. of coal per day of twenty-four hours, and the heating season of 128 days would enable a total saving of 55,296 lb.

Flexible Joint Remedies Turnbuckle Brake-Rod Failures

The Elmira Water, Light & Railroad Company has had considerable trouble due to the breaking of the turnbuckle brake rods on Standard O-45 maximum traction trucks. This rod is a rigid member carrying a turnbuckle, and failure was due to the compressive forces which were sometimes applied eccentrically so that they tended to bend the rods.

This was remedied by making a turnbuckle brake rod with a joint, the latter having sufficient play in it to avoid the bending action. One of these rods is shown in the accompanying illustration. To make the joint, a socket 4½-in. long and 1¼-in. in diameter was drilled in the threaded section. The rod that fits therein is 1 in. in diameter so that there is ¼-in. play, which is enough to take up the bending action. The two parts are held together by a loose-fitting bolt.


TURNBUCKLE BRAKE ROD WITH FLEXIBLE JOINT

On the United Railroads of San Francisco, Cal., it is customary to give the air-brake reservoir a thorough test at every overhauling; but without removing it from the car. After the drain cock has been removed and an air vent attached, water is pumped into the reservoir to a pressure of 160 lb., although the normal air pressure for braking is but 70 lb. This test has proved effective in avoiding reservoir troubles.

News of Electric Railways

Traffic and Transportation
Financial and Corporate
Personal Mention
Construction News

Mayor on St. Louis Controversy

Sets in Motion Plan for Renewing Conferences with United Railways—First Meeting on June 20

The plan of the city of St. Louis, Mo., to take up actively again the settlement of its differences with the United Railways is gradually unfolding. As stated in the ELECTRIC RAILWAY JOURNAL of June 16, page 1109, Mayor Kiel announced that on June 15 he would send a special message to the Board of Aldermen asking the members to appoint a committee of three who with the Mayor and City Counselor shall be authorized to take up the existing controversy with the United Railways over the mill tax. The Mayor carried his plan to the Board of Aldermen on June 15, in accordance with his announced purpose, but Alderman Schwartz and others rebelled against the plan of the Mayor to create a special committee including City Counselor Daues to conduct United Railways compromise negotiations. By a vote of nineteen to nine the Aldermen decided to eliminate Counselor Daues, an appointive official, and substitute Comptroller Louis Nolte, an elective official. Alderman Schwartz is chairman of the public utilities committee, and the effect of Mayor Kiel's special request was to take away from the standing committee headed by Mr. Schwartz the consideration of the United Railways tangle. Nathan Hall, acting president of the Board of Aldermen, appointed as a special committee of aldermen, Messrs. Tamme, Bergt and Schrantz. Comptroller Nolte and Mayor Kiel will act also for the city.

A few minutes after this matter had been disposed of Alderman Tamme introduced a second resolution directing the standing committee on streets, sewers and wharves to take steps to select the route of an interurban loop downtown in connection with the free bridge. This was a subject of legislation which for two years had also been referred to the public utilities committee.

On the same day Mayor Kiel wrote a letter to Richard McCulloch, president and general manager of the United Railways, asking him to name a committee of five to confer with the city's committeemen in the Mayor's office on June 20. The Mayor said this meeting and all subsequent ones would be open to the public.

Rapid Transit Commission Suggested

Mayor Davis of Cleveland Announces His Intention of Seeking to Create a Rapid Transit Commission

As a result of recommendations of the city planning commission and a number of civic organizations, Mayor Harry L. Davis of Cleveland, Ohio, has announced his intention of asking the City Council to authorize the appointment of a rapid transit commission. the submission to the voters of a bond issue for a sufficient amount to extend the subway entrance to the new Cuyahoga River bridge to the Public Square, and for the construction of an underground terminal at the Public Square. This work would require about $3,500,000.

The city charter provides for a rapid transit commission of five members to serve without compensation, when it is decided that such a commission is necessary. The commission would be authorized to lease any underground railway or rapid transit line to the Cleveland Railway. In this its operation would be similar to that of the Cincinnati plan.

It is believed by members of the city planning commission and others that, if the subway is ever to be extended in Superior Avenue to the Public Square, now is the time to do it while the underground approach to the bridge is under construction.

The proposed plans include two loops of track under the Public Square and terminal arrangements which would provide a concourse over the tracks, so that patrons could reach their cars directly by descending a stairway from this concourse, thus making it unnecessary to cross the tracks.

Arguments were presented to the Mayor for the immediate completion of this portion of an underground system, extensions in other directions to be taken up later. The experience gained in building the proposed stretch of underground road would reach many things that are peculiar to the city, and in future work officials could be guided by the experiences in this construction.

Chicago Legislation Lost

Chicago Traction Bills Die in House Committee—Development as Recommended by the Chicago Traction and Subway Commission at Standstill

After the four Chicago traction bills intended to supply the enabling legislation for Chicago's extensive traction plan had passed the Senate with a generous majority in their favor, they were reported to the House committee on public utilities and went to the third reading, when the committee adjourned finally without a record vote on any of the four measures. The General Assembly adjourned on Sunday morning after an all-night session on June 16. This means that the development of the Chicago transportation plan as recommended by the Chicago Traction & Subway Commission is at a standstill for a period of two years, or until the next meeting of the State Legislature.

Strike in Dayton

Sixty-six Employees of Dayton Line, Operating Fourteen Miles of Road and Fifty Cars, Struck on June 16

Sixty-six motormen and conductors of the Dayton (Ohio) Street Railway on June 16 drove their cars to the carhouses at 9 a. m., and declared a strike because the company had refused to recognize the union. They had previously been granted an increase of wages and were working under a schedule ranging from 26 to 32 cents an hour based on the length of service. Demands were made for 31 cents for night men and 32 cents for day men, with 16 cents an hour for substitutes.

The company has announced that the cars will be operated with volunteers from its own organization and new men living in the city. Not only had wages been increased, but the company had offered the men insurance entirely free of cost to them in lieu of recognition of the union. Several conferences were held with the men, and the officers of the company had been led to believe there would be no strike. It is said that organizers have been at work among the men for some time.

Among other things contained in a statement issued by the company is the following:

"The development of negotiations which led up to the present situation seems to indicate that our men are being persuaded against their own interest by an unknown influence, and the company will, therefore, endeavor to settle the matter without regard to the question involved in the recognition of the union or the right of doubtful outside influences to dictate its policy."

The wages of employees of other roads operating in the city have been increased, but as none of them recognize the union it is feared that an effort will be made to involve the men on the other lines.

Strike Investigation Closed

Washington Inquiry Concluded—Hearings in Progress More Than Five Weeks

The case before the Senate committee which has been investigating the recent strike of the employees of the Washington Railway & Electric Company, Washington, D. C., was closed on June 16, when counsel concluded their arguments. Senator Pittman announced that Senator Hughes, the chairman of the committee, who has been unable to attend any of the hearings, would probably not be able to join with the committee in its report to the Senate. He said, however, that Senator Hughes undoubtedly would be permitted to file his report, or to join with the committee in its report later.

Members of the investigating committee on June 18 began to frame individual statements of the facts in the case as they appear to them. As soon as all the members of the committee have these statements ready Senator Pittman, acting chairman of the committee, will call a meeting. He expects it will be possible to get the committee together in about a week's time. After the committee in executive session has considered the facts in the case it will then work on its recommendations to the Senate. Along with the suggestions made by counsel for the strikers, for the company and on behalf of the public, the committee will give consideration to the bill submitted to it by Secretary Wilson of the Department of Labor. This measure is designed to put an end to the causes of strikes and lockouts by clothing a commission with power to settle the questions of wages and hours of labor. The hearings before the Senate committee have extended over a period of five weeks.

Strike in Vancouver

A strike of conductors and motormen on June 13 tied up all the lines in Vancouver, North Vancouver and New Westminster, B. C.. owned by the British Columbia Electric Railway. Not a wheel turned on the day of the strike, and the company made no effort to take the cars out of the carhouses. Hundreds of jitneys did a thriving business, but there were thousands of early workers who had to walk in from their homes in the outlying districts. The representatives of the union of employees presented a demand recently for an increase in wages to meet the high cost of living. The company offered a compromise which was not accepted.

It is stated that the company will make no effort to operate. Jitney competition has caused such a serious falling off in revenue that the cars in the city have for months been operated at a loss. There is said to be no intention of securing new men to replace the strikers. The strikers, it is claimed, realize that the company is unable to pay higher wages, but the men maintain that they cannot keep their families on the present wages. There has been no manifestation of hard feeling between the company officials and the union leaders, and both the company and the striking employees are looking toward the City Council for action that will remove the competing traffic.

A late report from Vancouver on the strike states that the 800 strikers on the company's lines have been joined by the 500 men employed by the same company in Victoria and that no cars are being operated in either city.

Columbus Suburban Franchise

The Columbus Railway, Power & Light Company, Columbus, Ohio, was granted a twenty-five-year franchise for its Westerville suburban line by the Franklin County Commissioners on June 13. This line is 10.364 miles in length. So long as the franchise has an unexpired period of not less than fifteen years, the control of the service is to be in the hands of the public, through the commissioners. They will exercise this authority through a street railway commissioner whose salary of not more than $50 a month is to be paid out of the revenue of the line.

The company is to receive an income of not more than 6 per cent on its present investment and 8 per cent on future capital required. The value of the investment was fixed at $350,000. For the first ten years the company waives all earnings on $75,000 of this amount, but a working capital of $25,000 is included, which makes the amount on which return shall be paid $300,000. All revenues are to be turned into the working fund and all expenses paid from it.

Three fare zones are provided between the Columbus city limits and the Westerville terminus, and the rate of fare for each zone is the same. There is to be a sliding rate of fare, the lowest to be 2½ cents per zone and the maximum 6 cents. At the start the fare is to be 4 cents per zone. Should this prove too high, the fare will drop to 3½ cents per zone when the working fund reaches $35,000. On the other hand, if it is too low, the rate will advance to 4½ cents per zone when the working fund reaches $15,000. In other words, the working fund is the barometer. The cash fare is to be 5 cents as long as the ticket fare is 4½ cents or less per zone, and 6 cents when the ticket fare is more than 4½ cents.

The public may purchase the line at the actual value ascertained at the time of purchase, plus 10 per cent. All disputes are to be settled by arbitration and the company must pay its share of public road improvements.

The company advertised the franchise in the Columbus *Dispatch* of June 16 as "a model for future street railway franchises in Ohio."

Baltimore Promotes Social Activities

United Railways & Electric Company Organizes Club for Social and Recreation Purposes

With a charter membership of 700 or 800 the employees in the offices of the United Railways & Electric Company, Baltimore, Md., are forming a club for social and recreation purposes. For years the company has provided clubrooms, bowling alleys, baseball diamonds, etc., for the platform men in its employ, but there has never been a definite organization for similar activities among the office employees.

T. A. Cross, president of the company, in a letter indorsing the movement has outlined the scope of the new organization, and made certain suggestions for the consideration of the board of governors of the new club. He has made it very clear, however, the participation of the officers as such will be in an advisory rather than in a governmental capacity.

The organization is to be composed of both women and men in the company's employ. Mr. Cross has indicated that the company will provide commodious and well-equipped clubrooms downtown close to the general offices, and will set aside for athletic purposes a portion of the tract owned by the company at its Columbia Avenue shops. This new field will not conflict with the athletic field at Columbia Avenue now used by the conductors and motormen. The name of the club will probably be the United's Recreatoinal League. Membership is to be contingent upon employment by the company, though the matter of making certain concessions to members of the families of employees is to be taken up at the organization meeting.

PRESIDENT CROSS INDORSES PROJECT

President Cross in his letter indorsing the project said:

"In considering the question in its entirety, two sides have appeared to me. First, since an employee spends so much of his life in the place of his employment, it is highly desirable, from his standpoint, that both the place and the people with whom he is associated should be altogether congenial in order that his work may not become mere drudgery. An organization or a series of recreational activities that will throw the employees together more in social intercourse is bound in time to make the business surroundings more congenial. This is the employees' side. Second, when a body of employees is happy in the working surroundings and harmonious relations are maintained between the individual employees, they are bound to be more efficient. As a strictly business proposition, then, I feel that in offering such a project the company's heartiest support, I am simply making an investment which should be parallel to providing proper ventilation or clean floors in the offices. This is the company's side. Keeping both sides of the whole matter constantly in mind, I believe that the little innovation which it is now proposed to introduce will, in course of time, prove exceedingly beneficial to all concerned."

Compromise in Duluth

Agreement Reached with City as a Result of Which Condemnation Proceedings Will Be Withdrawn

The Duluth (Minn.) Street Railway has entered into a compromise agreement with the City Council as a result of which condemnation proceedings to take over the system under municipal management will be dropped. The company agrees to the immediate construction of an extension of its line from Morgan Park to New Duluth, a distance of 2¾ miles, a 5-cent fare on all lines at the end of the war, or in any event not later than Jan. 1, 1920, and universal transfers on all lines now constructed or to be built within the city limits.

The agreement was reached at a conference on June 18 between the City Commissioners and A. M. Robertson, Minneapolis, president of the company. It calls for the operation of the New Duluth line before Dec. 31, 1917. The United States Steel Corporation, through whose property the extension will be projected, is now preparing the right-of-way at a cost to it of $146,000. Under the terms of the compromise the company will continue to charge an extra fare for rides west of Eighty-fourth Avenue West going west and east of Forty-ninth Avenue West going east on the Morgan Park-New Duluth line until the time fixed by the agreement. The attitude of the city officials in the matter is expressed by Mayor Magney, who said:

"In view of the unsettled world conditions the adjustment now made is probably the best that could be obtained. It complies with the original demands of the city from the street railway before condemnation proceedings were authorized by the City Council. Municipal ownership of the street railway system is simply deferred, and the condemnation proceedings may be instituted at any time the city may find it necessary. The policy of the street railway in the future will have to be different from that which it has pursued in the past."

P. G. Phillips, commissioner of public utilities and a staunch advocate of municipal ownership of all utilities, cast the only vote against rescinding the action of the Council in condemning the street railway system.

Public Utilities in Russia

Under the title, "Public Utilities in Russia" there appeared in the May issue of *Russia*, a journal of Russian-American trade, an article in part as follows:

"Among the many lines of investment in Russia which will deserve the attention of American capital probably few are likely to be more attractive in the combination of safety with good returns than the loans which will be made by hundreds of Russian cities and towns for the construction of public utilities. On this subject Richard Martens of R. Martens & Company, Inc., New York, in a note among others on the results of his investigation of Russian conditions last summer, says:

" 'Nearly all the cities and towns visited on our tour which do not already possess requisite civic improvements are preparing to float loans for the purpose of constructing tramway, lighting, water-supply and drainage systems—only another evidence of the widespread awakening of the people at large and their demand for improvements. As a result of the towns having spent little or nothing on municipal improvements, the municipal indebtedness is lower than anywhere else in the civilized world. Furthermore, before a municipal loan is floated, the proposal must be submitted in full detail to the Minister of Finance at Petrograd. There the matter is carefully studied and worked out with due consideration of the existing tax rate; and when finally the loan is approved it is fully guaranteed by the government.'

"The extent to which the town and urban areas of Russia lack the public utilities that the whole people is now demanding may be judged from certain statistics of 1913. In respect to tramways, or street railway systems, the number of towns equipped is of course much smaller than those having some sort of general water supply. Electric lighting, on the contrary, has made considerable progress, having been adopted in a considerable number of small towns."

Attempt at Strike Fails

Employees at Bloomington Stand by the Company Against Outside Influence

The breaking of an agreement existing between the car men and the Bloomington & Normal Railway & Light Company, Bloomington, Ill., resulted in an incipient strike of about 15 per cent of the men employed by the company on May 18. Previous to this time the car men had been working under an agreement dated to expire on Sept. 1, but the company, realizing the increase in living costs, offered a new agreement to be effective from June 1, providing for an increase of approximately 10 per cent.

The proposed new agreement was signed by a majority of the men. Seven of the car men, under the leadership of outside organizers, refused to accept the agreement and five more were discharged for cause. These twelve employees then declared a "strike" against the company. Their places were immediately filled, as were those of fourteen additional men who left their posts.

The company continued to give full car service with the exception of a slightly curtailed night schedule during the early period of the trouble. Traffic has shown only a slight decrease from normal.

A campaign of intimidation and therats against working car men and their families made resort to the courts necessary, and on June 9 an injunction was issued by the court in favor of the company and its employees restraining the strikers from using violence against the company's employees and property, intimidating passengers or distributing literature designed to discourage riding upon the cars.

Previous to the granting of the injunction the men issued the following statement to the public:

"We, the undersigned employees of the Bloomington & Normal Railway & Light Company, being motormen and conductors, desire the public to know that we are satisfied with our employment, and that the wages and conditions are agreeable. Each of us is working under an unexpired contract of employment. All we ask is to be left alone so we can fulfill our duties."

This statement was signed by fifty of the working car men and had an appreciable effect upon public sentiment.

In sympathy with the striking car men a majority of the employees in the power house left employment with the company on June 12. Their places were filled promptly and power service continued without interruption.

An agreeable feature of the unpleasantness has been the demonstration of an excellent spirit of co-operation between the faithful employees and the company. This is commented upon editorially in the current issue of the *B. & N. Light*, the company's house organ. The title of the editorial is "Boys, We Thank You." It follows in part:

"The spirit shown by the employees of this company has been an exhibition of loyalty and bravery seldom equaled. It is a matter of deep gratification to know what loyal fearless fellow workers we have and we take this opportunity of assuring all of you of the deep sense of obligation which your splendid conduct has left in us.

"Your brave action in sticking to your posts has meant that we have been able to give to the citizens the service which it is our duty and obligation to give. To every man who has fulfilled the trust placed in him are due the thanks and the deep appreciation of the city.

"All we ask is that we be allowed to attend to our work without annoyance, molestation or interference. We obey the laws, we fulfill our obligations, not only as an industry but as citizens, and the activities of outside trouble makers and agitators seeking, for their own advantage, to stir up mischief, have not nor will they cause us to swerve from our work so necessary to the welfare of the city.

"Your welfare and interests are to us a matter of deep concern and we promise you that we shall leave nothing undone to lighten your added burdens. Your personal courage speaks for itself.

"If it has done nothing else but shown your loyalty and good will and brought out this spirit of fellowship and co-operation, the situation will have been worth all the annoyance it has caused."

Southern Pacific Electric Extension Opened.—The electric line extension of the Southern Pacific Railway from Whiteson to Corvallis, Ore., began operation on June 17. The extension is 40 miles long.

Employees Must Stand Through Congested Portions of Cities.—While street and interurban railways must furnish seats for conductors and motormen at other times, Attorney General McGhee of Ohio has ruled that the men in charge of cars must stand while passing through congested portions of cities.

I. C. C. Bill Before House.—The bill increasing the number of members of the Interstate Commerce Commission from seven to nine was brought up in the House on June 13 and was made unfinished business whenever that order of business is again reached, which may be in two or three weeks. The bill has already passed the Senate.

More Utilities Buy Coal Properties.—The Elmira Water, Light & Railroad Company, Elmira, N. Y., is reported to have purchased for $150,000 the properties of the Queenstown Coal Company at East Brady, Pa., with an annual output of 30,000 tons, while the American Light & Traction Company is reported to have bought certain properties of the White Star Coal Company in Harlan County, Ky.

Men at Alliance Get Demanded Increase.—The board of arbitration on June 15 decided in favor of the employees of the Stark Electric Railroad and the Cleveland, Alliance & Mahoning Valley Railway and awarded them the advance in wages demanded, 5 cents an hour. All other matters up for settlement between the company and the men were agreed to before the strike was declared. The split came over the question of wages.

Atlantic Coast Assessment Confirmed.—The Supreme Court of New Jersey has affirmed the assessment levied by the State Board of Taxes and Assessment upon the gross receipts of the Atlantic Coast Electric Railway, Asbury Park, N. J., amounting to $363,742. The company sought to have a reduction of $67,752 made for current delivered to the Atlantic Coast Electric Light Company, but the Supreme Court ruled that the company must pay its tax on this sum.

B. J. Arnold Engaged by Baltimore.—The Mayor of Baltimore, Md., has engaged Bion J. Arnold, Chicago, Ill., as consulting engineer to advise the city in connection with the plans for improvement which have been laid before the Mayor by the Pennsylvania Railroad. These plans include new tunnels through the city to convert the Philadelphia, Baltimore & Washington into a four-track railroad. The public meanwhile is urging the Mayor to require the railroad to install electricity as motive power on its tunnel lines.

Third Arbitrator to Be Called in East St. Louis.—The two arbitrators who have been considering the differences between the employees and the East St. Louis & Suburban Railway, East St. Louis, Ill., have been unable to agree on the wage question and have decided to name a third arbitrator to act with them under the terms of the arbitration agreement. Up to June 19 ten names had been submitted, but none of those proposed was acceptable to both sides. The situation remained unchanged on June 21 with respect to the selection of the third member.

Twin Peaks Tunnel Line at San Francisco Soon Ready.—The work of lining the Twin Peaks tunnel has been completed and the finishing touches are being put on the stations at Laguna Honda and the two portals. The Board of Public Works called for bids for June 20 on the construction of a double-track line from Market and Castro Streets through the tunnel to Sloat Boulevard beyond the west portal, a total distance of about 3 miles. It is expected that this work will be completed in time to allow cars to be operated through the tunnel before the first of next year.

Budget Plan for Bonds Advocated at Cincinnati.—Alfred Bettman, speaking before the New Charter Commission recently, advocated that bond issues for each year be made up on the budget plan by the Mayor and that all be acted upon at once. This would prevent the haggling and unsatisfactory results that sometimes arise out of bond legislation all through the year. Mr. Bettman also argued in favor of creating a municipal public utilities commission, which would have charge of all the utilities of the city. This would mean that the jurisdiction of the Rapid Transit Commission would be changed to include all other utilities in addition to the new loop that is to be constructed.

Wage Conferences in Ogden.—Representatives of the employees of the Ogden, Logan & Idaho Railway, Ogden, Utah, and the officials of the company are conferring over the matter of wages. Under the old scale the men received 25 cents an hour for the first two years, 27½ cents for the third and fourth years, and 30 cents an hour thereafter. The company offers to sign a new contract providing for the payment of 25 cents an hour for the first year, 27 cents an hour for the second year, 30 cents an hour for the third and fourth years and 32 cents thereafter. It is said that the men consider the offer of the company inadequate owing to the present era of high costs.

Frontier Case Again Before Commission.—Further objections were made on June 7 before the Public Service Commission for the Second District of New York by the New York Central Railroad against the project of the Pennsylvania Railroad and the Delaware, Lackawanna & Western Railway to use the tracks of the Frontier Electric Railway for a main connecting link for their freight traffic between Buffalo and Niagara Falls and Canada. It was indicated by the commission that it would require still further testimony before taking action on the revocation of the Frontier's certificate. This matter has been referred to previously in the ELECTRIC RAILWAY JOURNAL for Jan. 20, page 135; Feb. 10, page 262, and April 14, page 706.

Paving Claims Paid.—The Central Park, North & East River Railroad, New York, N. Y., has paid to the city $184,524, representing the first dividend of 75 per cent upon judgments obtained by the city and claims allowed by the referee. The actions upon which judgments were obtained and the claims established before the referee were, for the most part, predicated upon certain provisions of the railroad law, which obligated street railways to maintain the pavement between their tracks and for 2 ft. outside. Because of the refusal of the Central Park, North & East River Railroad to maintain the pavement areas when notified to do so, the city did the paving at its own expense and charged it to the company. The case was carried by the railroad through the Court of Appeals.

Injunction Against Abandonment of Unprofitable Line.—A public carrier will not be permitted to abandon a branch of its system because it is not profitable, states Judge Arthur M. Wallace, in the Jefferson Circuit Court at Louisville, who has granted a temporary restraining order against the Louisville (Ky.) Railway. The company, required by the Board of Park Commissioners to remove a double track on Forty-sixth street to the side of the street, has proposed abandoning the half mile of track, which leads from the terminus of the Broadway line to a summer amusement park, operated only in a small way and served by another line of the railway. Suit brought by the owner of the amusement resort led to the injunction. Cost of the changes to the railway would be $14,000, it was stated by the company, and patronage would not justify the outlay.

Seattle Mayor States His Attitude on Bridge Matter.—Although the City Council of Seattle, Wash., has passed two ordinances both intended to prevent street railway traffic by the Puget Sound Traction, Light & Power Company over the Fremont bridge, until the company agrees to pay $1,000 a month for the privilege of operating over the structure, or in lieu of that a lump sum of $60,917 and $333 a month thereafter, Mayor H. C. Gill has announced that cars are to operate over the structure. The Mayor, who has the power to prevent the operation of cars over the bridge, stated that he would not take any action to deprive the people of the north end of the city of car service. He regards the interests of the public to be paramount to any dispute between the city and the company and expresses the opinion that the question of rental is one that can be agreed upon by the parties interested, or be fixed by the courts.

St. Louis Loop Matter Up Again.—In addition to negotiating the compromise with the United Railways, St. Louis, Mo., the special committee appointed from the Board of Aldermen was instructed to investigate the question of a municipal interurban loop, down town, to accommodate the electric railway lines that use the Free Bridge. The municipal loop question has been under consideration for more than a year by the Board of Public Service. Two routes have been suggested. The route which is favored by the board at present would be north on Seventh Street from the Papin Street terminus of the highway approach to a loop bounded by Walnut, Sixth, Chestnut and Seventh Streets. The other route under consideration would extend north on Fourth Street to Morgan, west to Eleventh Street, connecting with the Illinois Traction System tracks, and back to Seventh Street and Clark Avenue by way of streets that have not been determined.

Bonds Proposed for Tacoma Municipal Extension.—First action toward the building of the Eleventh Street municipal railway extension to the east side of the bay to connect with the big shipyards was taken by the City Council of Tacoma, Wash., recently when the ordinance was introduced authorizing the issuance of $180,000 of city utility bonds to provide funds to build, equip and place the line in operation. The line may be single or double track. C. D. Atkins, the commissioner of public works, is placed in charge of construction. While no arrangement has been made for the sale of the bonds, it has been officially agreed that the money is to be taken temporarily from the light and power reserve fund. To make this possible it was necessary to include in the ordinance a clause requiring that the car line be operated to produce sufficient revenue to pay off the principal and interest. Should the line fail to provide this amount, the deficit is to be paid by drawing upon such sources of revenue as come from corporation taxes. These requirements were included in the ordinance through the necessity of protecting the city in the purchase of the bonds.

Seattle Elevated Will Cost $937,000.—According to a report made to the City Council of Seattle, Wash., by A. H. Dimock, city engineer, the extension of the municipal street railway proposed by Councilman Oliver T. Erickson, by the construction of an elevated street railway on Washington Street, from Fourth Avenue South to Railroad Avenue, and on Railroad, Whatcom Avenue and West Spokane Street, to the West Waterway, and an extension with the Ballard lines, will cost $937,000. The report places the cost of the double-track elevated of steel on Washington, from Fourth Avenue South to Railroad Avenue, at $550,000; cost of a double-track wood-trestle railway on Railroad Avenue, Whatcom Avenue, and Spokane Street to the West Waterway at $300,000; sidewalk along one side of the wooden structure along Railroad and Whatcom Avenues, $12,000; extension of Division A of the municipal line from Thirteenth to Fifteenth Avenue West, and from north end of Fifteenth Avenue N. W., bridge on Leary Avenue, to Market Street, $75,000. Mr. Dimock estimates that by building a portion of the line on Railroad, Whatcom and Spokane, where there are no railway tracks to interfere at the present time, the cost may be reduced about $40,000.

Kentucky Franchise Tax Decision.—As noted briefly in the ELECTRIC RAILWAY JOURNAL for June 16, page 1111, the railways operating in Kentucky have gained an important victory in a recent decision of the Supreme Court of the United States in the matter of franchise taxation. The finding applies to the electric railways as well as to the steam railroads. The Louisville & Interurban Railway was a party to one of the group of cases. The court in effect holds that railroads and public utility corporations have the right to the same equalization of their property values for purposes of taxation as is enjoyed by the owners of other property. The question common to all of the cases at issue was as to the rights of the railroads to have their property assessed for taxation at no higher proportion of its actual value than other property throughout the State is assessed. In its decision the United States Supreme Court upheld the Federal Circuit Court for the Eastern District of Kentucky, holding that property in general throughout the State is assessed at not exceeding 60 per cent of its actual value, and that the railroads have the right to insist that their properties shall not be assessed at more than 60 per cent of their actual value.

Financial and Corporate

Annual Reports

Havana Electric Railway, Light & Power Company

The comparative income statement of the Havana Electric Railway, Light & Power Company, Havana, Cuba, for the calendar years 1915 and 1916 follows:

	1916		1915	
	Amount	Per Cent	Amount	P Cent
Gross earnings	$6,017,708	100.00	$5,541,302	100.00
Operating expenses and taxes	2,443,885	40.61	2,337,506	42.18
Net earnings	$3,573,823	59.39	$3,203,796	57.82
Other income	144,561	2.40	147,874	2.66
Gross income	$3,718,384	61.79	$3,351,672	60.48
Fixed charges	1,297,093	21.55	1,115,414	20.13
Net income	$2,421.291	40.24	$2,236.258	40.35

A summary of the operations of the various departments also follows:

Department	Gross Earnings from Operation	Operating Expenses and Taxes	Per Cent of Gross Earnings	Net Earnings from Operation	Per Cent of Gross Earnings
Electric railway	$3.122,362	$1,346,260	43.12	$1,776,102	56.88
Electric light	2,099,059	552,236	26.31	1,546,824	73.69
Gas	575,290	344,927	59.95	230,363	40.05
Stage lines	219,334	198,874	90.67	20.459	9.33
Electric omnibuses (one month)	1,662	1,558	95.54	74	4.46
Total	$6,017,708	$2,443,885	40.61	$3,573,823	59.39

The most notable developments of the last year were in the new business of the electrical and gas departments, although the results of railway operation were better than in any preceding year. The total number of passengers carried on the cars during 1916 was 59,698,791, an increase of 9.93 per cent over 1915. In the electrical department the gross earnings increased 13.09 per cent and the net earnings 13.68 per cent, while in the gas department the gross gained 12.2 per cent and the net 23.6 per cent.

Comparative statistics of operation for the railway department in 1916 and 1913 show the following results:

	1916	1913	Per Cent Change
Number of passengers carried	59,698,791	56,782,362	+ 5.14
Passenger car-miles	12,143,682	10,543,739	+15.17
Passenger earnings	$2,984,939	$2,839,118	+ 5.14
Passenger earnings per car-mile	$0.2458	$0.2693	— 8.73
Operating expenses	$1,307,928	$2,909,233	— 8.34
Operating expenses per car-mile	$0.1076	$0.1353	—20.47
Operating ratio (per cent)	41.89	49.05	—14.60
Net earnings from operation	$1,814,434	$1,482,260	+22.40

The foregoing comparison is made with 1913 because this was the last preceding year that showed a normal growth. During 1914 and 1915 traffic conditions in Havana were very much disturbed by the abnormal extent of unemployment.

The earnings of the stage lines continued to decrease, the loss in 1916 being $45,937 or 17.3 per cent. The falling-off was partly due to labor conditions, but mainly to the preference of the public for the street cars. It is expected that the electric motor omnibuses, twelve of which were placed on trial last December, will enable this service to be continued with profit.

Cleveland, Painesville & Eastern Railroad

The operating revenues of the Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio, for the calendar year 1916 totaled $441,139, an increase of $37,087, while the operating expenses rose $30,951 to $222,988, leaving net revenue from railway operations of $218,150, a gain of $6,136. Taxes at $27,280 showed a slight increase, so that the operating income of $190,870 represented a gain of $5,329. Non-operating income fell off a little, and the deductions from income, mostly owing to miscellaneous debts, increased $4,162 to a total of $137,414. The surplus of

$56,329 for the last year, therefore, was only $1,062 greater than that of 1915. The gain in operating revenues for 1916, amounting to 9.08 per cent, was in marked contrast to the result obtained in 1915, a loss of 0.36 per cent. The 1916 percentage gain was the best since 1910, while the numerical gain was the largest in the company's history.

The increased earnings per mile during 1916 are shown below: Operating revenues per mile, $11,512, an increase of $968; operating expenses per mile, $5,819, an increase of $807; net operating revenue per mile, $5,693, an increase of $160, and operating income per mile, $4,980, an increase of $139. The total expenditures for additions and improvements chargeable to capital account in 1916 were $68,340.

Electric Railway Statistics

Rising Costs Affect the East—Comparison of Returns for March, 1917, and for the Quarter, January-March, 1917, with Those for 1916

A comparison of electric railway statistics for the quarter, January-March, 1917, with figures for the corresponding months of 1916, made by the information bureau of the American Electric Railway Association, indicates that the expenses during this period have increased faster than the revenues. The rising costs of materials and supplies used by electric railways, together with increases in wages and taxes paid, have disastrously affected electric railways throughout the country and particularly those operating in the Eastern district.

Data for the three months ended March 31, 1917, representing 9717 miles of line of companies scattered throughout the country, figured on the per mile of line basis, indicates an increase in operating revenues of but 6.25 per cent, while operating expenses increased 10.93 per cent and net earnings decreased 1.99 per cent. Data representing approximately 75 per cent of the above mileage indicate an increase in the amount of taxes paid of 7.65 per cent and a decrease in operating income of 8.13 per cent.

The returns from the city and interurban electric railways, as shown in detail in the appended table, have been classified according to the following geographical grouping: Eastern District—East of the Mississippi River and north of the Ohio River. Southern District—South of the Ohio River and east of the Mississippi River. Western District—West of the Mississippi River.

Of the three groups shown in the accompanying table, returns for the Southern and the Western apparently indicate a slight degree of improvement over the corresponding period of the previous year, while returns for the Eastern are decidedly unsatisfactory. Data for the latter district, representing 6428 miles of line, indicate an increase in operating revenues of 6.25 per cent, in operating expenses of 12.85 per cent and a decrease in net earnings of 5.15

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS, MARCH, 1917 AND 1916

Account	UNITED STATES				EASTERN DISTRICT				SOUTHERN DISTRICT				WESTERN DISTRICT			
	Amount, March, 1917	Per Mile of Line 1917	Per Mile of Line 1916	% Increase	Amount, March, 1917	Per Mile of Line 1917	Per Mile of Line 1916	% Increase	Amount March, 1917	Per Mile of Line 1917	Per Mile of Line 1916	% Increase	Amount, March, 1917	Per Mile of Line 1917	Per Mile of Line 1916	% Increase
Operating revenues	$20,947,801	$2,156	$2,016	6.94	$14,956,486	$2,327	$2,174	7.04	$1,384,733	$1,304	$1,224	6.54	$4,606,582	$2,069	$1,943	6.48
Operating expenses	13,751,218	1,415	1,281	10.46	9,927,049	1,544	1,380	11.88	782,016	736	718	2.51	3,042,153	1,366	1,264	8.07
Net earnings	7,196,583	741	735	0.82	5,029,437	783	794	†1.39	602,717	568	506	12.51	1,564,429	703	679	3.53
Operating ratio, per cent	1917, 65.65; 1916, 63.54				1917, 66.35; 1916, 63.47				1917, 56.44; 1916, 58.60				1917, 66.02; 1916, 65.05			
Average number of miles of line represented	1917, 9,717; 1916, 9,621				1917, 6,428; 1916, 6,359				1917, 1,062; 1916, 1,059				1917, 2,227; 1916, 2,203			

COMPANIES REPORTING TAXES

Account	UNITED STATES				EASTERN DISTRICT				SOUTHERN DISTRICT				WESTERN DISTRICT			
Operating revenues	$15,925,326	$2,134	$2,030	5.12	$10,500,275	$2,262	$2,167	4.38	$847,613	$1,298	$1,214	6.92	$4,577,438	$2,113	$1,985	6.45
Operating expenses	10,797,358	1,447	1,328	8.96	7,306,655	1,574	1,438	9.46	470,065	720	682	5.57	3,020,638	1,395	1,289	8.22
Net earnings	5,127,968	687	702	†2.14	3,193,620	688	729	†5.62	377,548	578	532	8.65	1,556,800	718	695	3.16
Taxes	1,125,856	151	140	7.86	725,545	156	143	9.09	69,672	107	101	5.94	330,639	153	145	5.52
Operating income	4,002,112	536	562	†4.63	2,468,075	532	586	†9.22	307,876	471	431	9.28	1,226,161	565	551	2.54
Operating ratio, per cent	1917, 67.80; 1916, 65.41				1917, 69.58; 1916, 66.35				1917, 55.46; 1916, 56.18				1917, 66.01; 1916, 64.93			
Average number of miles of line represented	1917, 7,461; 1916, 7,369				1917, 4,642; 1916, 4,573				1917, 653; 1916, 653				1917, 2,166; 1916, 2,143			

†Decrease.

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR QUARTER, JANUARY-MARCH, 1917 AND 1916

Account	UNITED STATES				EASTERN DISTRICT				SOUTHERN DISTRICT				WESTERN DISTRICT			
	Amount, January-March, 1917	Per Mile of Line 1917	Per Mile of Line 1916	% Increase	Amount, January-March, 1917	Per Mile of Line 1917	Per Mile of Line 1916	% Increase	Amount, January-March, 1917	Per Mile of Line 1917	Per Mile of Line 1916	% Increase	Amount, January-March, 1917	Per Mile of Line 1917	Per Mile of Line 1916	% Increase
Operating revenues	$60,005,005	$6,175	$5,812	6.25	$42,693,189	$6,642	$6,251	6.25	$3,955,892	$3,725	$3,550	4.93	$13,355,924	$5,997	$5,633	6.46
Operating expenses	39,930,526	4,109	3,704	10.93	28,734,534	4,470	3,961	12.85	2,300,032	2,166	2,073	4.49	8,895,960	3,995	3,748	6.59
Net earnings	20,074,479	2,066	2,108	†1.99	13,958,655	2,172	2,290	†5.15	1,655,860	1,559	1,477	5.55	4,459,964	2,002	1,885	6.21
Operating ratio, per cent	1917, 66.54; 1916, 63.73				1917, 67.30; 1916, 63.37				1917, 58.15; 1916, 58.39				1917, 66.62; 1916, 66.54			
Average number of miles of line represented	1917 9,717; 1916, 9,621				1917, 6,428; 1916, 6,359				1917, 1,062; 1916, 1,059				1917, 2,227; 1916, 2,203			

COMPANIES REPORTING TAXES

Account	UNITED STATES				EASTERN DISTRICT				SOUTHERN DISTRICT				WESTERN DISTRICT			
Operating revenues	$45,726,718	$6,129	$5,862	4.55	$30,035,511	$6,470	$6,247	3.57	$2,421,209	$3,708	$3,515	5.49	$13,269,998	$6,126	$5,755	6.45
Operating expenses	31,435,899	4,213	3,846	9.54	21,241,282	4,576	4,125	10.93	1,363,515	2,088	1,975	5.72	8,831,102	4,077	3,821	6.70
Net earnings	14,290,819	1,916	2,016	†4.96	8,794,229	1,894	2,122	†10.74	1,057,694	1,620	1,540	5.19	4,438,896	2,049	1,934	5.95
Taxes	3,255,475	436	405	7.65	2,077,168	447	408	9.56	204,468	313	297	5.39	973,839	450	430	4.65
Operating income	11,035,344	1,480	1,611	†8.13	6,717,061	1,447	1,714	†15.58	853,226	1,307	1,243	5.15	3,465,057	1,599	1,504	6.32
Operating ratio, per cent	1917, 68.74; 1916, 65.61				1917, 70.73; 1916, 66.03				1917, 56.31; 1916, 56.19				1917, 66.55; 1916, 66.39			
Average number of miles of line represented	1917, 7,461; 1916, 7,369				1917 4,642; 1916, 4,573				1917, 653; 1916, 653				1917, 2,166; 1916, 2,143			

†Decrease. There were twenty-nine days in February, 1916, and only twenty-eight days in February, 1917.

per cent. Returns representing approximately 75 per cent of the above mileage show an increase in the amount of taxes paid of 9.56 per cent and a decrease in operating income of 15.58 per cent. Returns for the Southern and Western groups indicate that expenses have increased at about the same percentage rate as the earnings. Both groups show, however, increases of approximately 6 per cent in net earnings and 5 per cent in operating income.

The operating ratio for the country as a whole has increased from 63.73 per cent in 1916 to 66.54 per cent in 1917. The operating ratio of the Eastern district has increased from 63.37 per cent in 1916 to 67.30 per cent in 1917. The operating ratios of the Southern and Western groups have changed very little.

Columbus, Delaware & Marion Sold

Ohio Road Disposed of at Foreclosure to R. H. Beaton—Reorganization Plan

Ralph H. Beaton,, 20 East Broad Street, Columbus, Ohio, representing Eastern capitalists, purchased the property of the Columbus, Delaware & Marion Railway at receiver's sale on June 11, for $417,494. The court had fixed a minimum price at $250,000. The company has underlying bonds amounting to $1,582,505 and some other obligations. Appraisers had fixed the total value of the property at $2,000,000. The sale was made subject to the mortgages and other claims.

The reorganization of the company under its new ownership has been approved by the Ohio Public Utilities Commission. The new company is authorized to issue $700,000 of common stock, $650,000 of 7 per cent preferred stock and $1,994,000 of 5 per cent twenty-year bonds, secured by mortgage on the entire property and franchises. Of the bonds $1,533,000 will be exchanged for underlying bonds of the old company and $100,000 will be sold to obtain funds for improvements during the present year.

Mr. Beaton has made no announcement of the personnel of the new owners, other than to say they are Eastern capitalists. It is understood that the name of the new company is the Columbus, Delaware & Marion Electric Company of Columbus. This company was incorporated recently by Samuel L. Finn, Daniel Blau, I. Webb, Ira Crawford and M. F. Sheeler.

Platform of Investors' Protective Association

Publicity, Proper Compensation for Service and Square Deal for Corporations Asked

The first regular meeting of the advisory council of the Investors' Protective Association of America, organized by N. L. Amster, was held recently. Those who attended were I. Reynolds Adriance, president of Merchants National Bank, Poughkeepsie; John A. Sleicher, editor *Leslie's Illustrated Weekly;* Oliver M. W. Sprague, professor of banking and finance, Harvard University; Peter G. Ten Eyck, former congressman from New York. Among the principal planks in the platform adopted were:

Vigorous opposition to wasteful and inefficient management of corporations.

All possible publicity respecting every corporate activity.

Waken, educate and enlighten the public to a realization that it is not only just, but to its interests, that railroads and public utility corporations receive proper compensation for their service.

Receivers shall not be appointed without first giving public notice to all parties in interest.

Reorganization committees to be chosen by a poll of security holders.

Readjust method and system of issue and sale of corporate securities so as to make corporations less dependent upon any single or collective group of banking and financial interests.

Mold public opinion as to the rights of minority stockholders and insist that they shall always have representation on the board of directors.

The slogan is "a square deal alike for corporations, security holders and the public."

Positive direct responsibility of directors and corporate managers. Severe penalties for misrepresentation of facts and for improper use of corporate funds or other corporate property.

Mr. Amster attracted nation-wide attention by his opposition to the receivership for the Chicago, Rock Island & Pacific Railway. Although he failed to prevent the appointment of a receiver he carried on his fight and subsequently was made chairman of the board of directors of the company. The road was rehabilitated out of current funds and Judge Carpenter only recently in the federal court terminated the receivership of the company without foreclosure.

R., S. & E. Bond Deposits Increase

The readjustment committee of the Rochester, Syracuse & Eastern Railroad, Syracuse, N. Y., has turned over to the bondholders' protective committee of that road bonds amounting to $357,000 which had been deposited with it. This leaves the latter committee as the only one in the reorganization of the railway. The bondholders' protective committee had deposited with it previous to this $4,165,000 of the $4,986,000 of bonds outstanding. The total now held by the protective committee is therefore $4,522,000, leaving $374,000 yet to be deposited.

Alabama Traction, Light & Power Company, Ltd., New York, N. Y.—The total operating revenues of the Alabama Traction, Light & Power Company, Ltd., for the calendar year 1916 were $1,471,433, and the total earnings $1,515,953, a gain of $474,805, or 45 per cent. Of the operating revenues $110,758 came from the railway department as compared to $86,349 in 1915, an increase of $24,409, or 28 per cent. The railway operating expenses at $93,319 represented an increase of $21,644, or about 30 per cent for the year.

American Cities Company, New York, N. Y.—The American Cities Company has passed its usual semi-annual dividend of 1½ per cent. The company has paid the dividend since July 1, 1915. Lee Benoist, vice-president of the company, is reported to have said: "Notwithstanding the fact that the earnings of the American Cities Company are showing very satisfactory increases, the directors felt that in view of current market conditions for corporation securities the earnings of the company should be applied to the purchase of its subsidiary companies' securities, issued for their general development purposes and, therefore, decided that for the time being a distribution on the preferred stock should be deferred. This action is recognized as materially strengthening the financial situation of the shareholders of the American Cities Company."

Buffalo (N. Y.) Southern Railway.—The bondholders of the Buffalo Southern Railway, operating between the Buffalo city line and Hamburg and Orchard Park, have until July 1 to decide whether to improve the road or dispose of the property to interests that will rehabilitate it. The Public Service Commission has recommended improved service and the betterment of the condition of the equipment. Towns along the company's line have complained about the service and equipment. The railway is in the hands of a receiver. The cars operate over the tracks of the International Railway between the Buffalo city line at Seneca Street and the terminal at Main and Clinton Streets. At one time the International Railway made an effort to acquire the property.

Commonwealth Power, Railway & Light Company, Grand Rapids, Mich.—Harris Forbes & Company, New York, N. Y., announce an offering of $1,000,000 of first lien and refunding 5 per cent gold bonds of the Consumers' Power Company, a subsidiary of Commonwealth Power, Railway & Light Company. The issue has been authorized by the Michigan Railroad Commission, based on appraisals made of the company's property. The offering is at 95. The bonds are due on Jan. 1, 1936, and are callable at 105 and interest on any interest date.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—The stockholders of the Mahoning Valley Railway, Mahoning Valley Southeastern Railway, Youngstown Park & Falls Street Railway and the Youngstown & Sharon Street Railway have ratified an agreement for the merger of these companies with the Mahoning & Shenango Railway & Light Company. As stated previously in the ELECTRIC RAILWAY JOURNAL the merger is being carried out entirely in the interest of intercorporate simplicity.

New Jersey & Pennsylvania Traction Company, Trenton, N. J.—The New Jersey & Pennsylvania Traction Company has filed a certificate with the Secretary of State of New Jersey reducing the authorized capital stock from $3,000,000 to $500,000, divided into 5000 shares.

Norton, Taunton & Attleboro Street Railway, Norton, Mass.—The Norton, Taunton & Attleboro Street Railway, successor to the Norton & Taunton Street Railway, has applied to the Massachusetts Public Service Commission for authority to issue $120,000 of twenty-year 5 per cent bonds and 12,000 shares of stock of a par value of $100 for the purpose of financing the purchase of and operating the railway and part of the property, including franchises and locations formerly owned by the predecessor company.

Pennsylvania & Ohio Railway, Ashtabula, Ohio.—The Pennsylvania & Ohio Railway, which operates the local city lines in Ashtabula as well as the interurban line between Conneaut and Jefferson, has been placed in the hands of Palmer Wardman, superintendent of the company, as receiver by Judge Roberts of the Common Pleas Court as the result of action brought by the Citizens' Savings & Trust Company, Cleveland, Ohio. There are three issues of bonds outstanding, namely, $600,000 of first mortgage 5s of the Pennsylvania & Ohio Railway, $100,000 of first 5s of the Pennsylvania & Ohio Railway, Jefferson division, and $200,000 of general 5s secured on the entire property, but subject of course to the other two issues. The Citizens' Savings & Trust Company is trustee of all the issues.

Sacramento Valley Electric Railroad, Dixon, Cal.—The sale of the property of the Sacramento Valley Electric Railroad under foreclosure, set for May 26, has been postponed until June 23. The road as at present constructed is 12 miles long.

Standard Gas & Electric Company, Chicago, Ill.—The Philadelphia Trust Company, trustee, is advertising for tenders of Standard Gas & Electric Company convertible 6 per cent sinking fund gold bonds maturing Dec. 1, 1926, to absorb $67,510 now available in the sinking fund. Tenders will be received until July 6.

Waycross Street & Suburban Railway, Waycross, Ga.—The property of the Waycross Street & Suburban Railway was sold on June 5 at receiver's sale to L. J. Cooper, acting for the Waycross Savings & Trust Company, for $14,500.

Dividends Declared

Asheville Power & Light Company, Asheville, N. C., quarterly, 1¾ per cent, preferred.

Birmingham Railway, Light & Power Company, Birmingham, Ala., 3 per cent, preferred; 1 per cent, common.

Carolina Power & Light Company, Raleigh, N. C., quarterly, 1¾ per cent, preferred.

Columbus Railway, Power & Light Company, Columbus, Ohio, quarterly, 1½ per cent, preferred, Series A.

Elmira Water, Light & Railroad Company, Elmira, N. Y., quarterly, 1¾ per cent, first preferred; quarterly, 1¼ per cent, second preferred.

Hestonville, Mantua & Fairmont Passenger Railway, $1.50, preferred; $1, common.

Interstate Railways, Camden, N. J., 30 cents, preferred.

Louisville (Ky.) Traction Company, quarterly, 1 per cent, common.

Ottawa (Ont.) Traction Company, quarterly, 1 per cent.

Philadelphia Company, Pittsburgh, Pa., quarterly, 87½ cents, common.

Tri-City Railway & Light Company, Davenport, Iowa, quarterly, 1 per cent, common.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., quarterly, 1½ per cent, preferred.

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$70,632	*$41,137	$29,495	$18,841	$10,654
1 " "	'16	62,654	*35,266	27,388	17,697	9,691
12 " "	'17	860,144	*486,017	374,127	219,215	154,912
12 " "	'16	794,421	*420,172	374,249	212,875	161,374

BATON ROUGE (LA.) ELECTRIC COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$18,987	*$9,849	$9,138	$3,497	$5,641
1 " "	'16	15,746	*8,239	7,507	3,463	4,044
12 " "	'17	221,302	*104,042	117,260	42,246	75,014
12 " "	'16	198,865	*106,176	92,689	32,306	60,383

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$8,783	*$9,768	†$985	$1,184	†$2,169
1 " "	'16	8,403	*8,258	145	1,096	†951
12 " "	'17	125,683	*115,708	9,975	13,533	†3,558
12 " "	'16	117,963	*98,444	19,519	13,370	6,149

CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$34,508	*$21,727	$12,781	$6,553	$6,228
1 " "	'16	28,234	*18,296	9,938	6,499	3,439
12 " "	'17	413,660	*240,547	173,113	78,606	94,507
12 " "	'16	374,920	*218,588	156,332	78,830	77,502

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$111,840	*$77,929	$33,911	$29,649	$4,262
1 " "	'16	99,983	*60,498	39,485	29,671	9,814
12 " "	'17	1,260,774	*875,961	384,813	358,215	26,598
12 " "	'16	1,154,663	*739,473	415,190	357,734	57,456

COLUMBUS (GA.) ELECTRIC COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$83,716	*$29,751	$53,965	$28,242	$25,723
1 " "	'16	64,878	*27,249	37,629	28,653	8,976
12 " "	'17	955,333	*365,122	590,211	342,377	247,834
12 " "	'16	760,864	*330,277	430,587	344,103	86,484

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$304,819	*$222,485	$82,334	$44,938	$37,396
1 " "	'16	285,006	*170,754	114,252	42,875	71,377
12 " "	'17	3,677,280	*2,339,418	1,337,862	522,904	814,958
12 " "	'16	3,239,025	*1,910,247	1,328,778	493,146	835,632

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$1,502,961	*$895,423	$607,538	$430,014	$177,524
1 " "	'16	1,313,207	*692,895	620,312	427,094	193,218
12 " "	'17	17,735,092	*10,142,214	7,592,878	5,087,199	2,505,679
12 " "	'16	15,411,384	*8,202,084	7,209,300	4,726,934	2,482,366

DALLAS (TEX.) ELECTRIC COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$172,927	*$108,683	$64,244	$40,680	$23,564
1 " "	'16	151,269	*96,674	54,595	36,597	‡19,998
12 " "	'17	2,083,501	*1,263,289	820,212	467,628	‡362,726
12 " "	'16	1,870,966	*1,152,216	718,750	417,656	‡310,294

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$75,386	*$41,843	$33,543	$11,547	‡$23,493
1 " "	'16	62,995	*34,387	28,608	8,864	19,744
12 " "	'17	874,517	*469,944	404,573	113,185	‡292,884
12 " "	'16	773,901	*403,133	370,768	105,766	265,002

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$298,279	*$185,584	$112,695	$64,945	$47,750
1 " "	'16	237,646	*141,270	96,376	62,648	33,728
12 " "	'17	3,247,423	*1,999,445	1,247,978	762,727	485,251
12 " "	'16	2,606,949	*1,553,933	1,053,016	755,424	297,592

EL PASO (TEX.) ELECTRIC COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$101,379	*$60,010	$41,369	$4,649	$36,720
1 " "	'16	85,799	*43,892	41,907	4,670	37,237
12 " "	'17	1,179,158	*729,649	449,509	60,573	388,936
12 " "	'16	1,023,938	*532,301	491,637	52,430	439,207

GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$150,698	*$106,371	$44,327	$37,295	$7,032
1 " "	'16	151,416	*102,096	49,320	36,579	12,741
12 " "	'17	1,952,355	*1,259,273	693,082	440,411	252,671
12 " "	'16	1,924,891	*1,224,641	700,250	435,388	264,862

GRAND RAPIDS (MICH.) RAILWAY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$103,025	*$72,419	$30,600	$18,187	$12,419
1 " "	'16	103,047	*67,256	35,791	13,700	22,091
12 " "	'17	1,310,473	*860,495	449,978	201,197	248,781
12 " "	'16	1,220,107	*829,735	390,372	167,166	223,206

HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$31,536	*$16,091	$15,445	$5,125	$10,320
1 " "	'16	27,765	*14,389	13,376	5,453	7,923
12 " "	'17	338,476	*196,272	142,204	62,621	79,583
12 " "	'16	298,288	*164,925	133,363	66,131	67,232

JACKSONVILLE (FLA.) TRACTION COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$58,675	*$38,495	$20,180	$15,754	$4,426
1 " "	'16	54,593	*34,645	19,948	15,439	4,509
12 " "	'17	647,964	*434,865	213,099	186,148	26,951
12 " "	'16	615,221	*424,264	190,957	179,363	11,594

KEOKUK (IOWA) ELECTRIC COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr.,	'17	$19,403	*$13,374	$6,029	$2,162	$3,867
1 " "	'16	19,930	*12,780	7,150	1,944	5,206
12 " "	'17	239,430	*164,342	75,088	24,587	50,501
12 " "	'16	236,759	*149,756	87,003	22,365	64,638

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*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

I. C. C. Powers Questioned

Illinois Rate Dispute to Test Supremacy of Public Service or Interstate Commerce Commission Rulings

Neither President Wilson nor Attorney-General Gregory will interfere in the controversy between the United States and the State of Illinois in the rate dispute referred to in the ELECTRIC RAILWAY JOURNAL for June 16, page 1115. The dispute arose when the State refused to have its 2-cent passenger fare law disregarded in the Interstate Commerce Commission's order to the railroads to remove discrimination caused by the State rates. At a conference held recently in Washington the Attorney-General said he had nothing to do with the case. Chief Counsel Folk of the Interstate Commerce Commission, who is in charge of the litigation, was requested to ask the commission to postpone the effective date of the order as urged by Governor Lowden in a letter to the Illinois Senators in view of present national conditions. Inasmuch as the commission has previously considered the case in this light, it is doubtful whether the request will be granted.

The maximum passenger rate of 2 cents a mile in Illinois is fixed by a law which has been upheld in the State Supreme Court. The Interstate Commerce Commission ordered the discrimination caused by the difference in state and interstate rates removed, incidentally holding 2.4 cents a mile to be a reasonable passenger fare. The railroads chose to increase the State rates. Judge Landis of the Federal Court at Chicago dismissed the suit of the railroads to have the Illinois law set aside. Then action was taken in the Federal Court at St. Louis which resulted in an order to conform to the 2.4-cent rate. The Illinois authorities are fighting this order. Meanwhile the railroads are collecting the higher rate of fare which involves the violation of the ruling of the State Public Service Commission, which has held the 2.4-cent rate to be excessive. Individuals responsible for such violations are liable to imprisonment for not more than one year. State Attorney-General Brundage has begun proceedings to test the powers of the Interstate Commerce Commission, on the ground that it is exceeding its authority.

Kansas City Fare Hearing

Controversy Involves Fares to Suburban Districts—Zone System with 2-Cent Rate Is Suggested

The Public Service Commission of Missouri held hearings in Kansas City on June 11 and 12 on the subject of fares outside Kansas City on the lines of the Kansas City Railways. The case is so stated, because the property owners in the Maywood and Fairmount Park districts outside the city limits are contending that they are not suburban communities, that they do not receive suburban or interurban service and that the commission in considering the cost of service to their communities should not consider those lines separately but whether or not the system as a whole is paying. Almost the entire time of the hearings was consumed in determining the identity of conditions in the Maywood and Fairmount districts and other districts in Kansas City with reference to street car service. The company showed that it had lost $60,000 because of the commission's order that 5 cents should carry a passenger through Kansas City and to Maywood, a suburban station. The property owners responded that many other stretches of track of equal length within the city limits would show similar losses if their accounts were separated from the company's total business.

Under the commission's order the street railway has, since October, 1916, been carrying passengers to Maywood, 2 miles beyond the city limits, without extra fare. The order had been issued because the company was carrying passengers to Fairmount Park, the same distance as Maywood beyond the city limits, without extra fare. At the hearing it was expected that the railway company would urge the commission to adopt a basis of 2 cents a mile for fares outside the city limits. President Kealy, upon examination, said that the company would soon file an amendment to this proposal which, he intimated, would incorporate the zone idea.

An amusing phase of the hearing was the attempt of property owners outside the city to emphasize the obligation of the company to give suburban dwellers the same service and rates as obtain on the city lines in Kansas City, Mo., and Kansas City and Rosedale, Kan. The three cities are practically one. The suburban district involved in the controversy lies between Kansas City, Mo., and Independence, Mo. Under present conditions the company gives unlimited transfers and a 5-cent fare in the three cities, charges 5 cents extra on the Dodson line, a suburban line which was not represented by property owners at the hearing, and 5 cents extra to Independence, with round-trip tickets to Independence being sold for 15 cents including the city fare.

A complication depended upon by the contestants is that the State law prohibits a city of first class from expanding to within less than 3 miles of a county seat. Except for this law, they say, their district would long ago have been taken into Kansas City, Mo., since Independence, the county seat of Jackson County, is little more than 3 miles from the Kansas City limits. No decision was rendered by the board. Briefs will be filed and another hearing will be held at Jefferson City in thirty days.

Electric Lines Relieve Traffic

7,250,000 People In and Out of Indianapolis in 1916 Via Electric Interurban

In an address delivered before the Transportation Club of Indianapolis, Ind., recently, E. B. Peck, vice-president of the Indianapolis Traction & Terminal Company, emphasized the importance of the members of the club lending their influence toward the granting of a legitimate fare increase to compensate for the greatly increased operating costs, instead of opposing such increases before the regulatory commission. He pointed out that if such increases were successfully opposed and continuously, that it meant government ownership as an inevitable end, and that the shippers would then be forced to pay the increased cost through taxes, which would be augmented by inefficient operation.

The immense volume of traffic that is handled at the Indianapolis terminal was shown in tabular form in the ELECTRIC RAILWAY JOURNAL for Feb. 17, page 321. Speaking of the importance of Indianapolis as an electric railway center, Mr. Peck said that 254,029 passenger trains arrived and departed from the local passenger and freight terminal during 1916—an average of 694 trains daily. He stated that the electric railways had done much to relieve the local freight congestion and that this was best evidenced by the fact that 25,980 freight trains arrived and departed from the terminal in 1916, or an average of seventy-one a day. Speaking further on the relation of this traffic to the steam roads, he said:

"From the viewpoint of the steam road official this traffic is termed local, applying to both passenger and freight. What this local traffic has meant to the city of Indianapolis is best shown by the fact that in 1916 these electric railways delivered to this terminal and transported from it 7,250,000 people, an average of about 20,000 a day. Every four months this is an equivalent of the entire population of the State. These electric railways are handling through the Indianapolis terminal approximately 200,000 tons of freight annually. What would be the sintuation if the steam railways had this additional traffic to take care of under the present conditions? This traffic, both passenger and freight, has not been taken away from the steam roads entirely, and being what is termed 'local' has relieved the steam roads to that extent, giving them that much additional facilities for handling the heavy through traffic. Instead, the traffic handled by the electric railways has been very largely developed by them and not taken from the steam roads."

Mr. McCulloch Reviews Conditions

In a signed article which appears in the issue of the *United Railways Bulletin* for June 15, published by the United Railways, St. Louis, Mo., Richard McCulloch, president of the company, makes a plea for an increase in street car fares, which he says is absolutely necessary. He points out that expense of operation is from 40 to 135 per cent greater now than it was in 1912. He claims that street railways can no longer operate on a 5-cent fare and realize a profit. Mr. McCulloch's statement was, in part, as follows:

"The popularity of the cheaper varieties of automobiles has robbed us of much of the Saturday afternoon and Sunday business. The constantly increasing use of transfers produces a rapidly diminishing average rate of fare. Although the nominal fare is 5 cents, the actual fare per ride last year was 3.22 cents.

"On the present basis, if 5 cents was a reasonable fare in 1912, it should be 10 cents at the present time. The 5-cent fare was adopted in horse-car days, when the average haul was perhaps one-half what it is now, when the price of labor was one-half the present price, and when materials were much cheaper. The free transfer was adopted in the early days of the electric railway, when the promoters had rosy views as to the prosperous future of the business. These views, it is needless to say, have not materialized.

"It is difficult to see how the business continues to exist on a 5-cent fare. Unless the fares are adjusted, street railways cannot continue as private investments. If they should become municipal investments, the municipality must then make up the deficit."

Seattle Seeks Jitney Regulation

A bill has been submitted to the City Council of Seattle by Councilman C. B. Fitzgerald in an effort to bring the "donation buses" and "private carriers for hire" under the jurisdiction of the city. The ordinance provides that any donation bus or private carrier shall deposit an insurance policy for $2,500 issued by a company authorized to do business in the State. The policies, it is said, might be issued by the jitney men's mutual company, as it is licensed to sell liability but not surety bonds. It is not yet determined whether the bonds of the Mutual Union Insurance Company will be acceptable. The Supreme Court at Olympia on June 8 heard the case started by the jitney men to compel the State Insurance Commissioner to issue to the Mutual Insurance Company a certificate to write surety bonds. The case was taken under advisement. William R. Crawford, attorney for the jitney drivers, submitted his views on the subject of city regulation, and the bill as drafted meets with his approval.

Improvements Made in Buffalo

Upon the recommendation of the municipal traffic commission which has been studying street railway traffic problems in the downtown section of Buffalo, N. Y., the City Council has granted the International Railway permission to lay a single track around the Soldiers' Monument in Lafayette Square. The asphalt space between the monument and the safety zone at Main Street will be enlarged under the supervision of the department of public works and the park department. This work will be done at once but owing to the condition in the steel trade the tracks cannot be laid until fall. By routing the Broadway cars around Lafayette Square instead of down Washington Street between Broadway and South Division Street the commission believes that the present congestion in Washington Street can be relieved by at least 50 per cent.

Other recommendations which will be considered by officials of the International Railway are the construction of additional loading tracks in Shelton Square for the Niagara and Grant Street lines and the construction of a frame shelter house over the safety zone at that point. The city has already established its first safety zone at Main and Eagle Streets, in the heart of the downtown business district and lines have been painted upon the street to indicate where cars may stop to discharge and take on passengers.

The City Council has approved the recommendation of the traffic commission that the skip-stop system be tried on the Main Street and Elmwood Avenue lines. For some time President E. G. Connette and J. O. Weigel, general superintendent of transportation, have been considering the trial of the skip stop but the company has not announced officially what will be done. Thomas Penney, vice-president of the company, declared before the City Council at the time the company received permission to lay a single track around the Soldiers' Monument that the company is willing to co-operate with the commission and the city authorities in any way that will contribute toward better service.

Advertisements on Transfers in St. Louis.—After July 1 the United Railways, St. Louis, Mo., will have printed in two colors on the back of transfers for some of the lines attractive advertisements calling attention to points of interest to the visitor in the city.

Schenectady Fare Increase Again Suspended.—The Public Service Commission for the Second District of New York on June 14 again suspended the proposed increases in fares on the lines of the Schenectady (N. Y.) Railway. The new period of suspension is from June 15 to Aug. 15. The effective date of these changes was originally set for Feb. 16.

Buffalo Survey Finished.—Charles R. Barnes, electric railway inspector for the Public Service Commission of the Second District of New York, who has been making a survey of conditions on the local lines of the International Railway, Buffalo, N. Y., has completed his report. It is expected that the commission's recommendations will be made public within the next three or four weeks.

Texas Jitneys Abandon Service.—The increasing expense of operation has cut into the profits of the jitneys in Texas so that many are discontinuing their service. In Houston there are now twelve vacancies. The Houston jitney ordinance authorizes the City Commission to designate the number of jitneys that can operate on any street. In Dallas, where jitneys are now running without restriction, save such as is imposed by the traffic ordinances, there is even a greater decrease in the number of jitneys. There have been as many as 400 jitneys in operation at one time, whereas now, it is said, there are less than 250.

Railway Men Witness One-Man Car Operation.—Representatives of street car interests and citizens of Waterloo, Iowa, have been investigating the operation of one-man cars in Fort Worth, Tex., with a view to determining the feasibility of introducing such service at Waterloo. Mayor Low of Waterloo visited Fort Worth last January, and he was followed by a delegation of street railway representatives from the Iowa city. The one man car as operated in Fort Worth by the Northern Texas Traction Company, a Stone & Webster property, was carefully investigated. A delegation of citizens has just made another investigation and action at Waterloo will be taken on its recommendations.

Commission to Consider Fare Increase Jointly.—The New York & North Shore Traction Company, Roslyn, N. Y., noted in the ELECTRIC RAILWAY JOURNAL for June 16, page 1117, as wanting to increase its fares from 5 cents to 7 cents, has applied to the Public Service Commissions for the First and Second Districts of New York for permission to make such changes in its rates. The company operates trolley lines from Flushing, to the New York City line at Little Neck, with an extension from Murray Hill, Flushing, to Whitestone, within the City of New York, and additional lines in Nassau County. The application to the First District Commission is being considered in connection with those of several other railway companies asking authority to charge 2 cents for transfers.

Louisville Proposes Traffic Rules.—The municipal committee of the Board of Trade of Louisville, Ky., has been directed by the board of directors to take up with the city authorities and with other organizations of the city the matter of passing an ordinance which will prohibit pedestrians from crossing the streets between crossings. This action resulted, in part, from numerous serious accidents during the last few weeks. It was taken on motion of J. B. Wathen, Jr., a prominent distiller of the city. He immediately began to carry out the instructions of the directors of the Board of Trade, which, in addition to the provision regarding crossing streets in the middle of blocks, would prohibit sprinkling downtown streets as well as the use of glaring headlights by motorists.

San Diego Line to Reduce Service.—The Los Angeles & San Diego Beach Railway, San Diego, Cal., has filed with the Railroad Commission of California an application for authority to reduce its train service and increase its rates so as to meet operating expense. The application states that the company has never made any profit nor paid any dividend and that it cannot pay expenses under its present tariff and give its extensive train service. The percentage of operating expense to gross revenue in 1916 was 83.66, and for the past six months the operating expense has exceeded the receipts. The company further states that it has tried in every way to increase its business, but has failed; that its train service is too large for the patronage and that it will continue to lose money unless the commission comes to its aid.

International Railway Opens Lake Ontario Resort.—The International Railway, Buffalo, N. Y., has opened its Lake Ontario summer resort for the season. The first excursion to Olcott Beach on the Lockport & Olcott division was run on Decoration Day and a special reduced fare of 75 cents from Buffalo has been made effective for the season. A few days before the opening W. J. Whiteside, traffic agent of the company, invited newspapermen of Buffalo, Niagara Falls and Lockport to visit the resort as guests of the company. The trip was made in one of the company's private cars and a dinner was served at the Olcott Beach Hotel on the company's grounds. The company has received much newspaper publicity on the opening of the park and many excursions have been booked for Olcott Beach during the coming season.

New York Commission to Consider Freight Advance.—As noted in the ELECTRIC RAILWAY JOURNAL for May 12, page 894, the railroads of New York within the jurisdiction of the Public Service Commission for the Second District filed with the commission tariffs providing a 15 per cent increase in intrastate freight rates parallel with the increases in interstate rates for which they had asked the Interstate Commerce Commission. The commission has set a hearing on these applications for June 25. The Interstate Commerce Commission has finished its hearings on the interstate rates and will probably announce its decision within a short time. While the various State Commissions are of course not bound to accept the conclusion of the Federal body as necessarily to be followed in intrastate rates, it seems to have been generally believed that such a result would obtain except in particular cases where local conditions require a different determination, and this because the whole structure of interstate and intrastate rates is closely interwoven.

Army Camp Calls for Service. — The Louisville (Ky.) Railway will, no doubt. benefit greatly from additional service made necessary by the location of the federal army camp for the Ninth District near Louisville. The site selected for the camp is about 6 miles south of the central part of the city and is divided by one of the lines of the Louisville & Interurban Railroad, which is controlled by the Louisville Railway. It lies almost directly east of the terminus of the Highland Park line and is also within a very short distance from the terminus of one of the extensions of the Fourth Street city line. As soon as the selection of the site was made known, officials of the company began preparations to extend such lines as might be desirable. Final decision will wait until the camp is platted by the engineers, which will probably be in a few days. Construction work will then be pushed to completion. A double-track line will be provided to serve the camp and city service will be given at a 5-cent rate with transfers from the camp line to and from the city lines of the company. The schedule will be arranged to suit the requirements of the camp. A special effort will be made, it is stated, to get the steel early so that the Louisville & Interurban can do some of the freight hauling. It is estimated that materials for camp construction will run to approximately 25,000 carloads. The camp will be served also by two steam roads. No difficult construction will be necessary on any route.

Personal Mention

B. W. Arnold has been appointed manager of the Eastern Wisconsin Electric Company at Oshkosh, Wis.

Charles E. Buchner has been appointed secretary to Chairman Oscar S. Straus of the Public Service Commission of the First District of New York to succeed Godfrey Goldmark.

George D. Baxter, local manager of the Exeter & Hampton Electric Company, Exeter, N. H., has been made successor to J. A. MacAdams, who is manager and purchasing agent of the Exeter, Hampton & Amesburg Street Railway, in addition to his former duties. Mr. MacAdams will enter the engineering office of C. H. Tenney & Company, Boston, Mass.

Matthew C. Brush, president of the Boston (Mass.) Elevated Railway, is the subject of a very complimentary sketch in the June number of *The American Magazine*. The author of the article, Alfred Grunberg, has reviewed several instances in the life of Mr. Brush to portray his character which has made possible his rise from small beginnings and has placed him early in life at the head of one of the largest electric railways of the country.

A. G. Carson has been appointed manager of the Eastern Wisconsin Electric Company at Fond du Lac, Wis., in charge of the electric and gas departments there. Mr. Carson began his public service work with the Grand Rapids, Grand Haven & Muskegon Railway in the power and transportation departments. He later became chief engineer of the Winnebago Traction Company at Oshkosh, Wis., and when that company was consolidated with the Eastern Wisconsin Railway & Light Company he was sent to Fond du Lac as superintendent of the electric department. He has held that position for the last eight years, and a year ago was appointed superintendent of the gas department.

J. P. Pulliam has been appointed general manager of the Wisconsin Public Service Company, Green Bay, Wis. Vice-President C. R. Phenicie, who was also general manager until the appointment of Mr. Pulliam, will in the future give his entire time to his duties as vice-president, and will be engaged largely with construction and development work. Mr. Phenicie will retain his office in Green Bay and handle the affairs of the company in that vicinity jointly with Mr. Pulliam. The latter was formerly vice-president and general manager of the Wisconsin Electric Railway and general manager of the Eastern Wisconsin Railway & Light Company. A biographical sketch of Mr. Pulliam appeared in the ELECTRIC RAILWAY JOURNAL for March 17, page 524.

Godfrey Goldmark, secretary to Oscar S. Straus, chairman of the Public Service Commission for the First District of New York, has been appointed assistant counsel to the commission. Mr. Goldmark became Mr. Straus' private secretary in January, 1916, at which time he was a member of the firm of Steele, DeFriese & Steele. He was born in New York City thirty-five years ago. Upon his graduation from the Cornell Law School in 1902 he entered the office of Judge Steele and a year later became a junior partner. Since that time he has made a specialty of corporation law and has written works on this subject. He collaborated in the preparation of the seventh and eighth editions of "White on Corporations" and is one of the authors of "Non-Stock Corporations," by White and Goldmark.

William H. Wharton has been promoted to the position of superintendent of buildings of the Brooklyn (N. Y.) Rapid Transit Company, succeeding H. E. Funk. Mr. Wharton became identified with that company about nine years ago as time checker. After two and one-half years in that capacity he was made assistant supervisor of structure and has held that position until the present time. Mr. Wharton saw service in the Spanish-American War and subsequently was employed by the Westinghouse Agricultural Machine Works at Schenectady, N. Y. His work with that company involved considerable traveling and netted him much valuable experience. This together with unceasing efforts in the service of the Brooklyn Rapid Transit Company has fitted him eminently to take the position of his former chief.

George O. Nagle, who resigned in November, 1915, as second vice-president and general manager of the Wheeling (W. Va.) Traction Company, has been appointed city manager of Wheeling under the new city charter. Mr. Nagle was also formerly president and general manager of the Panhandle Traction Company and the Steubenville & Wheeling Traction Company, controlled by the Wheeling Traction Company. He was in charge of the city railway properties at Wheeling as general manager for twelve years. During that time the properties were extended and largely rebuilt. The appointment was unanimous and was made despite the fact that Mr. Nagle had announced that he would not accept the post. Later, however, he yielded to public opinion. Mr. Nagle has been engaged in railroad and electric railway work all his life, and the new work upon which he will enter will furnish him with an opportunity for studying the public utility question from a different viewpoint than he has had before. Upon his appointment to manage the railways at Wheeling Mr. Nagle promptly entered into all work for the community betterment, became an influential member of the Board of Trade, entered the Playground Association, and at the time of the Panama-Pacific Exposition was appointed by Governor Hatfield of West Virginia to represent the State as a member of the exposition commission. Mr. Nagle is at present president of the West Virginia Manufacturers' Association. A portrait and a biography of him were published in the ELECTRIC RAILWAY JOURNAL of Nov. 13, 1915.

H. E. Funk, heretofore superintendent of buildings of the Brooklyn (N. Y.) Rapid Transit Company, has been appointed engineer of rapid transit lines, a newly-created position. Mr. Funk has been in the service of that company for about twelve years. He is a native of Ohio and received part of his education at Oberlin College. Following a short connection as an engineer in the maintenance of way department of the Big Four Railroad at Galion, Ohio, he became employed by the Brooklyn Rapid Transit Company as track foreman in 1905. Two months later he was appointed assistant engineer in charge of construction and buildings and held that position until three years ago. At that time he was promoted to the position of superintendent of buildings, the office he has just relinquished. Mr. Funk has given unreservedly to the execution of his duties and as the demands upon the way and structure department require a special supervisor of the subway and elevated roads, he was very naturally chosen for the post.

H. E. FUNK

Obituary

W. O. Johnson, formerly receiver for the Chicago & Milwaukee Electric Railroad, died at his home in Chicago on June 10, at the age of sixty-one. Mr. Johnson was born at Fredonia, N. Y. He received his legal education at Hamilton College, and practiced law at Buffalo until 1882, when he went to Chicago as general counsel for the Erie Railroad. In 1906 he was elected president of the Security Life Insurance Company, and five years later was named receiver of the Chicago & Milwaukee Electric Railroad, now the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

Judson C. Clements, a member of the Interstate Commerce Commission for the last twenty-five years, died in Washington, D. C., on June 18, at the age of seventy-one Mr. Clements was a native of Georgia and a veteran of the Civil War. He was admitted to the bar in 1869 and immediately began to practice law in Lafayette, Ga. From 1872 to 1880 he served in the Georgia Legislature and was a member of Congress during the following eight years. In 1890 he was appointed special United States attorney to acquire titles for the government lands now occupied by Chickamauga Park and Chattanooga Military Park. Two years later President Harrison appointed him to membership on the Interstate Commerce Commission and on Jan. 13, 1911, he was elected chairman of that body.

Samuel J. Dill, vice-president of the United Gas & Electric Engineering Corporation, New York, died at his home in Jamaica, Long Island, on June 14. He was born in Wallkill, N. Y., Oct. 3, 1864. Mr. Dill had a remarkable career in public service work, and few men in the gas, electric and street railway fields have had a wider circle of friends. Early in life he was connected with the Pennsylvania, West Shore and the New York, New Haven & Hartford railroads, and later with the Staten Island Rapid Transit Company. Following a subsequent connection with the Metropolitan Street Railway, New York, he became superintendent of the Forty-second Street & Manhattanville Railroad. He held this position at the time the street railways of New York City abandoned the cable system and adopted electric traction. In 1901 Mr. Dill went to Ypsilanti, Mich., as general manager of the traction company there and later held similar positions in Kalamazoo, Mich., and Youngstown, Ohio. In 1908 he became associated with the Susquehanna Railway, Light & Power Company, entrusted with the management of the Elmira Water, Light & Railroad Company, one of its subsidiaries, and two years later he became vice-president and general manager of this property. From Elmira he was transferred to New York as assistant to the president of the Susquehanna Railway, Light & Power Company, and upon the consolidation of this company into the United Gas & Electric Corporation he was made vice-president, and also held the office of vice-president and a director of many of its subsidiary companies. Early in 1915 Mr. Dill went to New Orleans to assume charge of the work of the company in the South, and returned to New York about a year later. At the time of his death he held the position of vice-president of the United Gas & Electric Engineering Corporation, and during the past year he devoted all of his time to oil interests in Oklahoma.

John F. Calderwood, who resigned as vice-president and general manager of the Brooklyn (N. Y.) Rapid Transit Company on Jan. 1, 1914, owing to failing health, died at Long Lake, Minn., on June 14 at the age of fifty-eight. He had selected Minnesota for a residence after his retirement from railway service because for many years he had been a resident of that State, but he lived only three years to enjoy the life on the farm which he had purchased there. Mr. Calderwood entered the electric railway business from the accounting side and achieved his success as a manager largely through his ability to grasp quickly the lessons taught by accounting reports. He was born at Redford, near Detroit, Mich., on May 27, 1859, and soon after graduation at the University of Michigan became accountant and credit manager of a carpet concern in Minneapolis. In 1888 he was elected city comptroller, and at the close of the term accepted the office of comptroller of the Minneapolis Street Railway which, with the St. Paul City Railway, was afterward consolidated as the Twin City Rapid Transit Company. Previous to the purchase of the Third Avenue Railroad in New York by the Metropolitan Street Railway in 1900, Mr. Calderwood spent some time in the East at the request of the owners of the property with a view of its rehabilitation. The knowledge of electric railway finance and management displayed by him during this period, as well as his previous record, led to his appointment in 1902 with the Brooklyn Rapid Transit Company, first as assistant to the president and later as vice-president and general manager. When Mr. Calderwood went to Brooklyn he took charge of a system which was still loose jointed in many parts and operating with steam on the elevated lines and out-of-date cars on the surface lines. He left it as one of the most progressive electric railway organizations in the United States and paying dividends. Mr. Calderwood was one of the founders of the American Electric Railway Accountants' Association and one of its first presidents. During his connection with the Twin City Rapid Transit Company he was also a frequent contributor to the technical press on accounting topics, and at one time conducted a department in this paper on electric railway accounting, but he was compelled largely to discontinue this outside work after going to Brooklyn on account of the exactions of the work there.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

Delaware & Maryland Traction, Light & Power Securities Company, Wilmington, Del.—Incorporated in Delaware to acquire railway properties and operate same. Capital stock, $5,000,000. Incorporators: DeArmond Lindes, R. Edward Ives and Charles A. Donnelly, all of Philadelphia. [June 9, '17.]

***Shoshone & Clearwater Railway, Marble, Idaho.**—Incorporated under the laws of Idaho to construct and operate a 33-mile railway to connect with the Chicago, Milwaukee & St. Paul Railroad at Marble. Fred Herrick, St. Maries, president.

***Flint & Great Lakes Railway, Flint, Mich.**—Incorporated to construct an electric railway between Crago from the Detroit United Railway tracks to the Buick factories in Flint. Capital stock, $100,000.

FRANCHISES

Eagle Rock, Cal.—The Glendale & Montrose Railroad has received a franchise from the City Council for the construction of a single-track line in the vicinity of its proposed station.

Modesto, Cal.—The Tidewater Southern Railway has asked the City Council for a franchise to construct a line along Ninth Street, up Nellie Street and thence across the canal. It is proposed to remove the present tracks of the company on N Street and Virginia Avenue.

St. Louis, Mo.—The United Railways Company of St. Louis has asked the Public Service Commission for permission to extend its Sarah Street line east from Sarah and Chouteau Avenue to Tiffany Street and south on Tiffany Street to Park Avenue. The completion of the Chouteau Avenue viaduct will give a direct connection from Park Avenue on the south to Florissant Avenue on the north, with transfers to all east and west-going lines.

Buffalo, N. Y.—The International Railway has received permission from the Public Service Commission for the Second District of New York to extend its Elmwood Avenue line from Hertel Avenue to the city line and also to extend its Franklin Street line between Chippewa Street and Allen Street.

Cleveland, Ohio.—The Cleveland Railway has received a franchise from the Village Council of Cleveland Heights to construct a double-track line from the Cedar Avenue S. E. terminal near East Boulevard along Cedar Avenue to Lee Road.

Columbus, Ohio.—After a series of conferences the County Commissioners of Franklin County and officials of the Columbus Railway, Power & Light Company came to an agreement on the franchise for the Westerville line on June 12 which, with a few minor exceptions, is in accordance with the first proposal of the company. The franchise as accepted calls for a twenty-five-year grant. The conditions of the franchise are referred to on page 1156 of this issue.

Pawtucket, R. I.—The Pawtucket Street Railway, operated by the Rhode Island Company, has received a franchise from the Board of Aldermen to relocate and lay rails in Broadway, School and Main Streets, Pawtucket.

TRACK AND ROADWAY

Mobile & Pensacola Railway & Navigation Company, Volanta, Ala.—This company, which has taken over the Mobile, Volanta & Pensacola Railroad, reports that 10 miles of track have been laid and contracts have been practically closed for the construction of the remainder of 35 miles between Volanta and Pensacola and for the erection of bridges.

Pacific Electric Railway, Los Angeles, Cal.—It is reported that the Pacific Electric Railway will construct an extension of its line from Santa Ana to Tustin.

San Diego (Cal.) Electric Railway.—Work on this company's extension to Balboa Park is being rushed to completion at a cost of about $120,000, and it is expected that the line will be placed in operation this month. The extension is 1½ miles long, rock ballasted, with 75-lb. rail inside the park and 114-lb. rail outside the park. Three steel bridges were required in the extension.

San Diego & South Eastern Railway, San Diego, Cal.—Work will soon be begun by the San Diego & South Eastern Railway on the construction of an extension from Santee to Lakeside, about 2 miles.

Waycross Street & Suburban Railway, Waycross, Ga.—It is reported that efforts will be made to improve and operate the line of the Waycross Street & Suburban Railway recently sold at receiver's sale.

Danville, Crescent & Kankakee Traction Company, Danville, Ill.—Plans are being made to revive the project of the Danville, Crescent & Kankakee Traction Company to construct a line from Danville to Kankakee. Practically all of the right-of-way has been secured. It extends northwest from Danville, through Potomac, Ellis, Rankin, Cissna Park and Crescent City to Kankakee. W. R. Nightingale, Crescent City, is reported interested. [April 4, '14.]

Murphysboro & Southern Illinois Railway, Murphysboro, Ill.—This company's new interurban line between Carbondale and Murphysboro is rapidly nearing completion, and it is hoped to operate the first car between those two towns on July 4. The bridge over the Big Muddy River is completed and cars from Murphysboro are now operating beyond that point. A. B. Minton, Murphysboro, president. [April 7, '17.]

Springfield (Ill.) Consolidated Railway.—This company is relaying about ¾ mile of double track on Peoria Road between Black Avenue and the State fair grounds.

***Goshen, Ind.**—It is reported that an interurban line may be constructed from Goshen to Kendallville, connecting with the Chicago, South Bend & Northern Indiana Railway at Goshen and with the Fort Wayne & Northwestern Railway at Kendallville.

Tri-City Railway, Davenport, Iowa.—This company has awarded a contract to the Central Engineering Company, Davenport, for grading its proposed line on Rock Island arsenal island.

Keokuk (Iowa) Electric Company.—This company will reconstruct its trolley and power transmission line between Hamilton and Warsaw, 5 miles. New poles and equipment have been ordered for this work, which will begin as soon as the new transmission line to Montrose is completed. The old wires will be restrung on new poles.

***Lafflet Electric Railway, Pella, Iowa.**—It is reported that D. S. Umbenhauer, 932 Park Street, Pella, is interested in the construction of a proposed electric railway in connection with the Wabash Railroad.

***Treynor, Iowa.**—Plans are being made to construct an electric railway from Neoga to Treynor, using the old right-of-way of the Iowa & Omaha Short Line. The new line will be built along one side of the right-of-way, leaving the balance for use as a public highway by the county. It is stated that no work will be done on the line this year, owing to the unsettled conditions of the markets for railroad material. E. A. Wickham, Council Bluffs, is interested.

New Orleans, La.—Plans are being made by the Elysian Fields Avenue Commission to renew the campaign for an electric line from New Orleans to Milneburg. Louis H. Burns, New Orleans, is interested. [Feb. 17, '17.]

Boston (Mass.) Elevated Railway.—A contract has been awarded by the Boston Elevated Railway to the Union Switch & Signal Company for signal apparatus to be installed in the Dorchester subway extension of the East Boston subway. The apparatus will include double impedance bond layouts, track transformers, automatic train stops, style L three-lens light signals and U. S. & S. model 15, vane-type, two-position track relays.

United Railways & Electric Company, Baltimore, Md.—This company contemplates the construction of an extension from Stone House Cove to Wagner's Point, about 1 mile.

Duluth (Minn.) Street Railway.—D. H. Clough & Company, Duluth, has received the contract for grading this company's proposed extension on Farrell Road.

West Jersey & Seashore Railroad, Camden, N. J.—Work has been begun by this company elevating its tracks in Westville over Timber Creek.

Salem & Pennsgrove Traction Company, Pennsgrove, N. J.—The Salem County Board of Freeholders has decided to postpone indefinitely further consideration of joining with the Salem & Pennsgrove Traction Company in building a temporary bridge across Salem Creek at Salem, for use of the trolley line. The freeholders were asked to pay $8,000 of the total cost of the structure, but thought that the trolley corporation would receive the greatest benefit instead of the public. Passengers must now walk across the bridge to make connections on the line between Salem and Pennsgrove.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the First District of New York will receive bids on July 5 for the construction of Route No. 49, Section 3, the Culver Rapid Transit Railroad in Brooklyn, from a point near Avenue X to Sheepshead Bay Road. Bids are asked on three forms of contract, one calling for the furnishing of all steel and the erection of the same together with the incidental necessary construction. Of the remaining two forms one calls only for the furnishing of the necessary steel, about 3900 tons, and the other for the erection of steel and the furnishing of the necessary materials and labor. The Culver Rapid Transit Railroad is one of the so-called South Brooklyn lines which is being rebuilt as a city-owned elevated railroad.

International Railway, Buffalo, N. Y.—Completion of the new electric line being built between Buffalo and Niagara Falls by the International Railway may be delayed by a movement which has been started in North Tonawanda which may force the company to elevate its tracks all of the way through this city. One track has been laid between Buffalo and Niagara Falls and double tracks have been laid at many points along the line. The track elevation through Tonawanda and North Tonawanda begins about a half mile south of Tonawanda and continues to a point south of the Payne Avenue crossing of the present Buffalo-Niagara Falls line. Payne Avenue and other important streets and roads in North Tonawanda are crossed at grade. Residents of Gratwick in the north end of North Tonawanda have appealed to the municipal authorities to stop further construction of the line at grade through the city. An appeal will be made to the Public Service Commission. It is charged that the operation of high-speed steel cars through North Tonawanda at grade would be dangerous to traffic along the roads.

Western New York & Pennsylvania Traction Company, Olean, N. Y.—Work will soon be begun by this company on the construction of new track on West State Street.

Poughkeepsie City & Wappingers Falls Electric Railway, Poughkeepsie, N. Y.—A certificate filed with the Secretary of State sets forth that the corporate name of the Poughkeepsie City & Wappingers Falls Electric Railway has been changed to the Poughkeepsie & Wappingers Falls Railway Company.

Rhode Island Company, Providence, R. I.—Work will soon be begun by the Rhode Island Company on the reconstruction of its tracks in Wakefield.

Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio.—Owing to franchise restrictions which the city of Berea tried to enforce, the Cleveland, Southwestern & Columbus Railway has built a 3-mile line around Berea and is now operating over the new line.

Port Jervis & Delaware Valley Railroad, Matamoras, Pa.—Although considerable money has been paid on stock, the project to build an electric railway from Milford, Pa., to Port Jervis, N. Y., has fallen through. The money will be paid back to the subscribers by the trustees with 3 per cent interest from Nov. 1, 1916, to May 1, 1917. The J. A. Vandergrift Company, Philadelphia, had the contract to build the road. [July 8, '16.]

Schenectady (N. Y.) Railway.—Work will be begun about July 1 by the Schenectady Railway on the double-tracking of its line on Rugby Road from Wendell Avenue to East Alley. The cost of the improvement is estimated at $17,000.

Dallas (Tex.) Southwestern Traction Company.—F. A. Kadane and George Kadane, president and superintendent, respectively of the Creek Construction Company, of Sapulpa, Okla., to which has been awarded the contract for the construction of the interurban line of the Dallas Southwestern Traction Company, between Dallas and Cleburne, have been elected directors of the Dallas Southwestern Traction Company. [June 16, '17.]

Texas Electric & Power Company, San Angelo, Tex.—Work will be begun immediately by the Texas Electric & Power Company on the construction of its proposed line from San Angelo to Winters, via Harriett, Miles, Rowena, Ballinger and Hatchell. Charles W. Hobbs, San Angelo, president. [April 28, '17.]

Saltair, Garfield & Western Railroad, Salt Lake City, Utah.—Work is in progress on the electrification of the Saltair, Garfield & Western Railroad, and it is stated that orders for considerable new material and equipment have been placed. H. A. Strauss, electrical engineer of Chicago, is in charge of the electrification. It is stated that electric cars will be operating to Saltair Beach within the next three months.

Petersburg & Appomattox Electric Railway, Petersburg, Va.—Work will be begun at once by this company double-tracking its line to the camp site at Lakemont.

Morgantown & Wheeling Railway, Morgantown, W. Va.—A report from this company states that it will construct 8 miles of new track.

SHOPS AND BUILDINGS

Boston & Worcester Street Railway, Boston, Mass.—This company has awarded a contract to Thomas P. Hurley for the construction of a freight station on Mechanic Street, Marlboro.

International Railway, Buffalo, N. Y.—This company has opened its new passenger terminal at Lockport, N. Y. The new building is of brick construction and replaces a frame terminal which has been in use for thirty-five years.

New York (N. Y.) Railways.—The rumor has been revived at this time that plans are being made for the construction of a new amusement building to occupy the site of the carhouse of the New York Railways on Eighth Avenue between Forty-eighth and Forty-ninth Streets. It is stated that the lease for the property has been drawn on a basis of twenty-one years' rental with renewal privileges.

Nipissing Central Railway, North Cobalt, Ont.—Bids are being asked by the Nipissing Central Railway for the reconstruction of its carhouse recently destroyed by fire.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—This company is erecting a storehouse 40 ft. x 110 ft., of brick and steel, on its property near the State fair park.

POWER HOUSES AND SUBSTATIONS

Norfolk & Bristol Street Railway, Foxboro, Mass.—This company reports that it expects to purchase one condenser pump.

Wilmington & Philadelphia Traction Company, Wilmington, Del.—Plans have been filed by the Wilmington & Philadelphia Traction Company for the construction of an addition to its power plant on the Brandywine River.

Georgia Railway & Power Company, Atlanta, Ga.—This company will construct a 38,000-volt transmission line from its Dunlap plant on the Chattahoochee River, 3 miles from Gainesville, to the Pacolet and Gainesville cotton mills and furnish about 6000 hp. for their operation.

Interstate Electric Company, San Angelo, Tex.—This company will construct an electric transmission line to Paint Rock.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—Work has been begun by the Milwaukee Electric Railway & Light Company on the construction of a $1,000,000 power house on the shore of Lake Michigan in the suburbs of Milwaukee.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Purchasing Agent Should Be Shock Absorbers for Department Heads

The Salesman Would Have Less Difficulty in Obtaining Information from Technical Men of Railways if He Were a Technical Man Himself

By ERNEST E. STIGALL
Purchasing Agent Kansas City Railways Company

It is difficult to say to what extent the general overhead cost chargeable to some particular article in manufacture would be reduced by showing 10, 25 or 50 per cent reduction in the expense of the sales force, as discussed by W. McK. White, in the issue of the ELECTRIC RAILWAY JOURNAL for June 2, page 1031. It is possible, however, to show very clearly the attitude of our company toward new material or equipment submitted for consideration and purchase.

We watch eagerly at all times for an opportunity to reduce our costs or to increase the safety or convenience of operation by new methods, new equipment, etc., which may be offered. On account of this policy, the company has for several years been represented by eight or ten officials at each annual convention, and has supplied each department with from one to a dozen copies of the ELECTRIC RAILWAY JOURNAL, which naturally stimulates interest and furnishes information relating to possible changes in equipment and supplies.

MANY TESTS BEING MADE ON EQUIPMENT

In addition to this, we are of course constantly studying and experimenting in our own plant and are in a position to consider new material or equipment submitted by manufacturers' representatives. The policy prevailing here in connection with new material or equipment is simply to reject such of these as the technical men in the department concerned may decide would not improve our present conditions, even though the material tested out to be all that was claimed for it. On the other hand, if the service results claimed for such equipment or material would improve present conditions, and we have reason to believe the performance under test would come up to the claims set forth, arrangements are immediately made for a complete service test.

By following this plan, we escape loading down our system with the details of a testing laboratory when there is nothing to be gained, and we do not lose the opportunity for a constant improvement of our property because of rejecting material which might prove valuable if adopted as a new standard simply because of red tape or a stone wall between ourselves and the manufacturer. We naturally avoid the practice of buying new material merely for the purpose of changing our purchases from Smith to Brown, etc.

Again referring to the article mentioned, it is our suggestion that the representative of the manufacturer would not have difficulty in obtaining information from the technical man of a street railway company, if the representative were a technical man himself. Obviously, little can be accomplished if a salesman equipped only with superlatives and assurances of 50 or 100 per cent saving, etc., is in conference with a practical operating man who wants actual, definite and complete information based on actual service performance. The engineer or mechanic is of course busy with the operation of the railway system, and it could very easily be that more than one-half of his time would be taken up by salesmen if he should permit this to be done. In my judgment it is the duty of the purchasing department to act as a sort of shock absorber to protect the different department heads from too many callers, just the same as the secretary to the executive of an organization would protect him.

When the purchasing department is in doubt regarding the advisability of a salesman calling directly upon the department head concerned, a special inquiry is made. If this department head believes it would be advantageous for him to go into the details of the material or equipment to be considered, then this is arranged for, but if the department head is already sufficiently informed so that he knows the subject under consideration would not improve his conditions, then the time of both the department head and the salesman are saved by this means. We do not believe there are many instances in which a recommendation to the president for purchase of certain materials for test would be refused approval. In my judgment the subject resolves itself into the question of conscientious service to the company, and a desire to show constant progress combined with a co-ordination through the proper organization, which will permit the company morale to obtain the proper results.

No Great Increase in Business Expected with Prices Soaring

"Spasmodic" Must Characterize Buying with Material Prices Continuing to Rise—Manufacturers Should Co-operate with Railways for Fare Increase

By W. S. HAMMOND
Vice-President Consolidated Car Heating Company

Considering the conditions existing in the material market at the present time, the business offering is fully as good as can be expected. What the future prospects are is very difficult to prognosticate, on account of the constantly climbing prices in the material market. This naturally makes for higher prices right along, and with car equipment and supplies at the present prices, and with higher ones to come. it is difficult to see how there will be anything but spasmodic buying for immediate needs. Sales of buzzer equipments are good and thermostatic control and starting signal systems are in fair demand.

Recent articles in the JOURNAL have discussed the possibilities for fare increase on the electric railways. This is a most vital subject. The power which the manufacturers can exert in helping to secure increases in fares should be put into concrete form. My idea is that the Manufacturers' Association should outline a campaign which each member could push vigorously in his own community. It is highly important that the public should be educated to the difficulties confronting the railways, not only because of the increased cost of materials, but also because of the increased maintenance charges of both roadway and cars, increased platform expenses, taxes, etc. Such increases in operating cost cannot be offset entirely even by putting into effect the most rigid economies. The situation of electric railways in these respects is akin to that of the steam roads, but the former have even greater difficulties to surmount in attaining relief.

As far as better business prospects for the manufacturers are concerned, it is my idea that there will be no great increase in the volume of business as long as prices continue to increase, for managers cannot possibly feel justified in planning extensions and improvements under present conditions. There will of course be good orders here and there, placed because of sheer necessity. but our railway companies must be made more prosperous in order that they may extend and improve their systems, thus improving the outlook for themselves, for the manufacturers and for those whom they serve.

Electric Power Club Discusses Present Problems

Standardization, General Engineering Recommendations, Cost Accounting and Other Questions Affecting Service to the Nation Discussed

The eighth annual meeting of the Electric Power Club was held at the New Willard Hotel, Washington, D. C., on June 11 and 12. The program, which was given in the May 26 issue, was carried out practically as planned. In the absence of Howard E. Coffin, W. S. Gifford outlined the work of the Council of National Defense and Paymaster John M. Hancock, officer in charge of purchase division of the Bureau of Supplies and Accounts, Lieut. Alexander Sharp of the electrical division of the Bureau of Steam Engineering and Mr. Dean, electrical expert of the Bureau of Construction and Repair, spoke of the methods of these various navy departments in filling their electrical needs.

The chief topic of discussion of the whole meeting centered around the address of C. E. Patterson of the General Electric Company on uniform accounting. The accounting and cost system which is recommended for adoption by electrical manufacturers has the indorsement of the Electrical Manufacturers' Club, the Electric Power Club and the Associated Manufacturers of Electrical Supplies. It moreover bears the indorsement of the Federal Trade Commission. Another paper which proved very instructive was one read on the analysis of increased cost in manufacturing conditions during the past three years. This showed the upward trend of prices of all material used in the manufacture of motors. There was also an interesting discussion on the subject of national economy.

E. R. Harding, the president of the club, owing to the condition of his health tendered his resignation as president, and C. L. Collens, 2d, the vice-president, was elected in his stead. F. S. Hunting of Fort Wayne, Ind., was elected vice-president and T. E. Barnum of Milwaukee was elected to the board of governors. C. H. Roth of Chicago continues as secretary and treasurer. There were no other changes in the board of governors, which now consists of the president, vice-president, secretary and treasurer in addition to the following: James Burke, Burke Electric Company, Erie, Pa.; J. C. Hobart, Triumph Electric Company, Cincinnati, Ohio; J. R. Jeffrey, Allis-Chalmers Manufacturing Company, Milwaukee, Wis.; T. E. Barnum, Cutler-Hammer Manufacturing Company, Milwaukee, Wis.; W. A. Layman, Wagner Electric Manufacturing Company, St. Louis, Mo.; S. L. Nicholson, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; H. C. Petty, Crocker-Wheeler Company, Ampere, N. J., and R. J. Russell, Century Electric Company, St. Louis, Mo.

Government Books on Statistics

Compilation for 1916 of Foreign Trade Statistics and a New Book of Business and Commercial Statistics

Two new official books of statistics that should be helpful to all manufacturers, and particularly to those whose products have foreign sale, have just been announced by the Bureau of Foreign and Domestic commerce, through E. E. Pratt, chief of the bureau. The title, "Commerce and Navigation of the United States, 1916," describes a regular annual publication of this department. This book is well known among those who study foreign trade. It is the original and only official source of yearly trade statistics. The 1916 number, according to Dr. Pratt, is one of the most important that have ever been issued, because that year stands out in the history of the foreign trade development of the United States. This book contains 950 pages of statistical tables, and forty-one pages of summary tables giving foreign trade data in a most convenient form by articles, by countries and by customs. The price of this book is $1.50.

The "Statistical Abstract" for 1916 contains 771 pages of the latest available American and foreign statistics. This is a reference book covering the subject of agriculture, forestry and fisheries; manufacturing and mines; internal communication and transportation; merchant marine and shipping; foreign commerce; consumption estimates; prices, money, banking and insurance. There are also commercial, financial and monetary sattistics of the principal countries in the world. Copies of this book are to be distributed at the price of 50 cents to cover the cost of printing. Both books are obtainable by addressing the superintendent of documents, Washington, D. C., or writing to the nearest district or co-operative office of the Bureau of Foreign and Domestic Commerce.

Copper Market Conditions

Government Contractors Hesitate to Place Orders—Plans Made to Pool All Purchases for Our Government and Its Allies

The *Wire Message*, published by the Habirshaw Electric Cable Company, Inc., and the Electric Cable Company, in reviewing the present market conditions, says: "'Waiting' would well describe the condition of the copper market during the past month. One feature of uncertainty as to the government's position has apparently been removed: On May 23 an announcement was made in Washington that plans were being devised to pool all purchases for our government and its allies. Assuming this will be done, there still remains three important points to be determined, viz., price, quantity, and periods of delivery. It is to be hoped that some definite information on these points will soon be forthcoming, and the uncertainty which now prevails in the copper market removed. During the latter part of May copper showed decided signs of improvement, which to our mind is fully justified: The present demand for copper is enormous, and the future requirements of our government and its allies must run into huge figures. Exports of copper during this year are breaking all previous records.

"Production and demand must determine prices. It is evident that if production exceeds demand prices must go down. At present there is no evidence that this is the case; in fact, all evidence is to the contrary. It should be noted that factories with government orders have been uncertain whether the government would supply the copper. Naturally they have hesitated to buy heavily. We read in the *American Metal Market* of May 28 that one large manufacturer having a contract to supply the government with articles requiring a large quantity of copper, applied for assistance. The government replied it could lend no aid, and the manufacturer was forced to go into the market and cover his requirements the best he could."

New Westinghouse Officers

At the organization meeting of the directors of the Westinghouse Electric & Manufacturing Company, officers were re-elected, with the addition of three new vice-presidents, as follows: H. D. Shute, who has been treasurer of the company; H. T. Herr, who has been vice-president of the Westinghouse Machine Company, now merged with the parent company; and Walter Cary, who has been vice-president of the Westinghouse Lamp Company. H. F. Baetz succeeds Mr. Shute as treasurer and assistant secretary.

G. E. Gets Order for Big Turbine

The Public Service Electric Company, Newark, N. J., has just placed an order with the General Electric Company for a 30,000-kw., 13,200-volt, 60-cycle, three-phase turbo-generator. As noted in the ELECTRIC RAILWAY JOURNAL of June 9, page 1040, the Essex plant contains at present two General Electric 25,000-kva. units. In addition a 35,000-kw. unit of the same type is in process of installation and a 50,000-kva. unit is on order. This last order for a 30,000-kw. unit will, when installed, give this plant more than three-fourths of its ultimate capacity, which is 200,000 kw.

ROLLING STOCK

London (Ont.) Street Railway is reported to have purchased five city cars.

Olympia (Wash.) Light & Power Company is reported to be considering the purchase of one-man cars.

Michigan Railways, Jackson, Mich., has specified the following details for five vestibuled pay-within cars which are being built for the company by the St. Louis Car Company:

Number	5
Builder	St. Louis Car
Type	pay-within
Seating capacity	40
Weight (total)	26,840 lb.
Truck centers	19 ft. 0 in.
Over bumpers	41 ft. 4 in.
Over vestibules	40 ft. 4 in.
Over posts	8 ft. 2 in.
Floor to ceiling	7 ft. 6 in.
Sill to trolley base	8 ft. 5¼ in.
Body	Steel sides with wooden superstructure
Interior trim	Honduras mahogany
Headlining	3/-16 in. Agasote
Roof	Turtle deck
Underframe	Steel
Air brakes	Westinghouse
Axles	St. Louis Car
Bumpers	Rico anti-climbers
Cables	St. Louis Car
Car trimmings	Bronze
Conduits	St. Louis Car
Curtain material	Pantasote No. 77
Curtain fixtures	Forsyth No. 88
Designation signs	Illuminated. E. S. S. Mechanism
Door mechanism	Hand-operated
Fenders	Ry. Co.'s design
Gongs	12 in. bronze pneumatic
Hand brakes	Ackley
Hand straps	Rico sanitary
Heaters	Peter Smith No. P-S
Headlights	Crouse-Hinds
Journal boxes	St. Louis Car
Paint	Murphy ABC
Registers	International R-5
Sand box	With Reliance trap valve
Sash fixtures	OMEdwards
Seats	St. Louis Car
Seating material	Rattan
Springs	Pittsburgh steel spring
Step treads	Mason
Trucks	St. Louis Car Co.'s 106-A max. traction
Ventilators	Automatic
Wheels	33-in. driver, 21-in. pony
Special devices	Faraday buzzers

Gary & Interurban Railroad, Gary, Ind., noted in the June 9 issue as having placed an order through Ford, Bacon & Davis for two motor and four trail cars, has specified the following details for this equipment.

Number	6
Date of order	May 28, 1917
Date of delivery	Oct. 1,1917
Builder	McGuire-Cummings
Type	Center-Entrance
Seating capacity	56
Weight (total)	38,000 lb.
Over bumpers	45 ft. 0 in.
Over vestibule	44 ft. 0 in.
Over all	8 ft. 6 in.
Rail to trolley base	11 ft. 0 in.
Body	All-steel
Interior trim	Cherry
Headlining	Agasote
Roof	Arch
Axles	Carbon steel
Bumpers	Rico anti-climber
Car trimmings	Bronze
Conduits	West.
Control	H. L. D.
Couplers	Tomlinson No. 8
Curtain fixtures	Curtain Supply No. 88 with "Rex All Metal" Rollers
Curtain material	Pantasote
Designation signs	Hunter
Door mechanism	Nat'l Pneumatic
Fare boxes	International
Fenders	H. B. Lifeguards
Gears and pinions	West.
Hand brakes	"Horne" double-acting
Hand straps	Rico sanitary
Heaters	Gold Car Heating
Headlights	Crouse-Hinds L.L.A.
Journal boxes	McGuire-Cummings
Lightning arresters	West.
Motors	4 West. 514-A inside hung
Registers	International
Sanders	Ohio Brass Pneumatic
Sash fixtures	O. M. Edwards
Seats	Hale & Kilburn No.400-A
Seating material	Rattan
Springs	Coil and elliptic, McGuire-Cummings
Step treads	Universal "Anti-Slip Tread"
Trolley catchers	Knutson No. 5
Trolley base	U. S. No. 13-D.
Trolley wheels	West. groove
Trucks	Arch bar with equalizers
Ventilators	Railway Utility
Wheels	Griffin F.C.S. 26 in.
Special devices	Consolidated Car Heating buzzer system, Ellcon white enamel stanchions

Springfield (Ill.) Consolidated Street Railway has specified the details shown in the following table on seven pay-within cars which are being built for it by the St. Louis Car Company:

Number	7
Builder	St. Louis Car
Type	pay-within
Seating capacity	40
Weight (total)	26,840 lb.
Truck centers, length	19 ft. 0 in.
Length over vestibule	40 ft. 4 in.
Width over posts	8 ft. 2 in.
Floor to ceiling	7 ft. 6 in.
Sill to trolley base	8 ft. 5¼ in.
Body	Steel sides with wooden superstructure
Interior trim	Honduras mahogany
Headlining	3/16-in. Agasote
Roof	Turtle deck
Underframe	Steel
Air brakes	Westinghouse
Axles	St. Louis Car
Bumpers	Rico anti-climbers
Car trimmings	Bronze
Cables	St. Louis Car
Control	K-36-J
Couplers	St. Louis Car
Curtain fixtures	Forsyth No. 88
Curtain material	Pantasote No. 77
Designation signs	Ill. E. S. S. Mechanism
Door mechanism	Hand operated
Fenders	Ry. Co.'s design
Gears and pinions	Nuttall
Gongs	12 in. bronze pneumatic
Hand brakes	Ackley
Hand straps	Rico sanitary
Heaters	Peter Smith No. P-2
Headlights	Crouse-Hinds
Journal boxes	St. Louis Car
Lightning arresters	West.
Motors	Two West. 532-B. outside hung
Paint	Murphy ABC
Registers	International R-5
Sand box	With Reliance trap valve
Sash fixtures	OMEdwards
Seats	Hale & Kilburn
Seating material	Rattan
Springs	Pittsburgh steel spring
Step treads	Mason
Trolley catchers	Ohio Brass
Trolley base	Ohio Brass
Trucks, type	St. Louis Car 106-A max. traction
Ventilators	Automatic
Wheels	33 in. driver, 21 in. pony cast-iron
Special devices	Faraday buzzers

NEW YORK METAL MARKET PRICES

	June 16	June 21
Prime Lake, cents per lb	32½	32½
Electrolytic, cents per lb	32½	32½
Copper wire base, cents per lb	36	36
Lead, cents per lb	11⅞	11¾
Nickel, cents per lb	50	50
Spelter, cents per lb	9¾	9¾
Tin, Straits, cents per lb	60⅝	63½
Aluminum, 98 to 99 per cent, cents per lb	61	61

OLD METAL PRICES

	June 16	June 21
Heavy copper, cents per lb	28	28½
Light copper, cents per lb	25½	25½
Red brass, cents per lb	17½	17½
Yellow brass, cents per lb	18	18
Lead, heavy, cents per lb	8¾	8¾
Zinc, cents per lb	7	7¼
Steel car axles, Chicago, per net ton	$48.00	$53.00
Old car wheels, Chicago, per gross ton	$36.00	$43.00
Steel rail (scrap), Chicago, per gross ton	$39.50	$48.50
Steel rail (relaying), Chicago, per gross ton	$42.50	$54.50
Machine shop turnings, Chicago, per net ton	$18.00	$19.50

CURRENT PRICES FOR MATERIALS

	June 16	June 21
Rubber-covered wire base, New York, cents per lb.	36½	36½
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable stranded, New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40.00	$40.00
Wire nails, Pittsburgh, per 100 lb	$3.50	$4.00
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$4.00	$4.10
Steel bars, Pittsburgh, per 100 lb	$4.40	$4.50
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$7.35	$7.90
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$9.05	$9.30
I-beams over 15-in., Pittsburgh, cents per lb	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.65
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$4.15	$4.85
Cement (carload lots), New York, per bbl	$2.40	$2.40
Cement (carload lots), Chicago, per bbl	$2.31	$2.31
Cement (carload lots), Seattle, per bbl	$2.60	$2.60
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.21	$1.18
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.22	$1.19
White lead (100 lb. keg), New York, cents per lb.	12¼	12¾
Turpentine (bbl. lots), New York, cents per gal.	44	43

TRADE NOTES

Frankel Connector Company, Inc., New York, N. Y., has moved its salesrooms to 1140-1146 Broadway.

Lawrence Grant has been appointed managing director and treasurer of the Eugene F. Phillips Electrical Works, Ltd., Montreal.

A. Press, consulting engineer and patent attorney, has changed his address from Norman, Okla., to 1777 Broadway, New York City.

Lincoln Electric Company, Cleveland, Ohio, announces that it has appointed the Ross Power Equipment Company, 617 Merchants' Bank Building, as its Indianapolis representative.

Francis C. Shenahon, for the last eight years dean of the College of Engineering of the University of Minnesota, has opened offices in the new Metropolitan Bank Building, Minneapolis, and will give his entire attention to his practice as a consulting hydraulic engineer.

Le Carbone Company, Paris, France, maker of Le Carbone carbon brushes for railway, lighting and power purposes, has just established a selling agency for South America with headquarters at Buenos Aires. This action, in view of the war conditions in France, is significant as a proof of the indomitable spirit and enterprise of this corporation. The North American sales of Le Carbone carbon brushes are being handled by W. J. Jeandron, New York.

Railway Improvement Company, New York, N. Y., announces that it has received the following orders for Rico sanitary hand straps: Eighty cars being built by The J. G. Brill Company for the United Railways & Electric Company, Baltimore, Md.; 100 cars being built by the Cincinnati Car Company for the Cincinnati Traction Company; four cars being built for the Toledo, Bowling Green & Southern Railway; eight cars being built for the Eastern Pennsylvania Railway; and fifteen cars being built for the Northern Texas Traction Company. It has also received orders for anti-climbers to be used on the cars being built for the Lewiston, Augusta & Waterville Street Railway and also for those of the Worcester Street Railway.

Stanley Motor Carriage Company, Newton, Mass., manufacturer of steam automobiles and railway cars, has been taken over by a new Delaware corporation of the same name. The new officers are: Prescott Warren, president; Carleton F. W. Stanley and Frank Jay, vice-presidents, and Edward M. Hallett, treasurer. They have all been associated with the company for twelve years. F. E. Stanley and F. O. Stanley, who founded the company in 1898, are now retiring.

Economy Fuse & Manufacturing Company, Chicago, Ill., through its president, A. L. Eustice, announces that every member of the organization, from the officers and directors to the newest office boy, has purchased one or more Liberty bonds. The employees, numbering more than 200, have subscribed a total of $80,000 worth of bonds through the company's selling plan, which is based on weekly payments proportioned to the wage or salary of the individual. In some cases the payments are as low as 25 cents a week. In addition, the company will pay the last $5 to the employee who remains with the company the required length of time. If an employee leaves the company before his subscription is entirely paid for, the money paid in will be refunded, together with 6 per cent interest.

Miller Trolley Shoe Company, South Boston, Mass., announces that the number of orders being received indicates the rapidly increasing popularity of this equipment on widely scattered properties. About 300 electric railways are now using these shoes. The New York, New Haven & Hartford Railroad has ordered enough shoes to equip twelve trains on its Nantucket Beach branch, as the result of favorable experience with this apparatus on the Providence-Fall River line of the company. Fifty shoes have been ordered within a few days by the Chicago, North Shore & Milwaukee Street Railway, and inquiries have been received from as far south as Brazil. A number of these shoes are in use in Cuba. In New England, the roads using this equipment are the Union Street Railway, New Bedford, Mass., six cars; Pittsfield Street Railway, ninety shoes; Cumberland County Power & Light Company, Portland, Me., twelve cars; Bangor Railway & Electric Company, two cars; Hartford and Bridgeport divisions of the Connecticut Company, ninety cars. Trial installations are also in service on the New Bedford & Onset Street Railway and the Massachusetts Northern Street Railway. The company is now bringing out an improved design of sliding shoe in which there are but thirteen parts, against twenty-one in the previous standard, and in which all bolts and nuts have been eliminated. This equipment will weigh about 5.25 lb., or about 1 lb. less than the ordinary 5-in. trolley wheel and harp. The company has recently moved into new quarters at 15 Elkins Street, South Boston.

NEW ADVERTISING LITERATURE

Portland Cement Association, Chicago, Ill.—A bulletin, "Concrete Tile for Land Drainage," illustrative and descriptive of types of concrete drain tiling.

Westinghouse Church Kerr & Company, New York, N. Y.—A reproduced blueprint of their mammoth Stirling boilers for the Detroit Edison Company. A large superimposed Simplex automobile shows by comparison the enormous size of furnace.

Combustible Engineering Company, New York, N. Y.: Bulletin B.2 on its type E stoker. It gives a number of cross-sections and elevations, and explains the detail operation of the stoker. Sections on distribution of air, automatic regulation, forced and natural draft, and smokeless operation are emphasized.

Wagner Electric Manufacturing Company, St. Louis, Mo.—A large calendar hanger on which the Wagner boy is shown with a model of the original plant built in 1889 in his hand, and comparing it with the present plant shown at the right. The dates of the present, past and succeeding months are given on the three pads and run from May 1, 1917, to June 30, 1918. Complete calendars for 1917, 1918 and 1919 are given on the hanger under the pads.

Lorain Steel Company, Johnstown, Pa.: Catalog No. 20, 259 pages. Deals with girder and high T-rails, slot rails, girder guard rails and other electric railway shapes; also gives the latest design of the company in special track work, including the "tadpole" type of tongue switch in manganese steel and guarantee construction, also various types of mates, frogs, and crossings. There is also a section on electrically welded joints which says that the electrical welding process is being applied not only to track in paved streets but to standard T-rail on exposed track. In such construction an expansion joint is used. The catalog is illustrated with handsome halftone sections of rails and other products of the company similar to those used in previous Lorain catalogs but brought up to date and including the latest sections.

New Publication

Electric Railway Transportation.* By Henry W. Blake, Editor ELECTRIC RAILWAY JOURNAL, and Walter Jackson, Business Manager, formerly Associate Editor, ELECTRIC RAILWAY JOURNAL, New York, N. Y. McGraw-Hill Book Company, Inc., New York, N. Y. 487 pages. Cloth, $5 net.

As the title implies, this book deals with the transportation methods and practices of electric railways. Very little relating to the work of electric railway transportation departments has been published in book form, and the authors of this volume have attempted to fill a gap in the literature of the industry. They state in their preface that they have devoted their efforts to making the information relating to their subject, contained in the Proceedings of the American Electric Railway Association and in the columns of the electric railway press, more readily available in book form, and to adding such comments of their own as may be of possible help to the man in the operating department. While the authors make no claim that the book is a complete compilation of the practices of all companies, many valuable operating data have been collated.

The first chapter, which deals with the various types of operating department organization, serves largely as an introduction. While not so divided by the authors, the subjects treated in the remaining eighteen chapters may be grouped under four heads, namely, relations between service and traffic, collection of revenue, promotion of traffic, and management of the transportation forces. Under the first heading the chapter titles (adjustment of service to traffic, accelerating traffic movement along the line, accelerating traffic movement on the car, car types in relation to traffic, city time-tables—preliminaries, and interurban schedules and dispatching) deal with such topics as standards of service, traffic counts and their analysis, car-demand curves, the rush hour and the problem of ameliorating rush-hour conditions, economy of higher speeds, the skip-stop, duration of stop, methods of speeding up car loading, effect of size of operating unit on traffic acceleration, car types and their relation to schedules, time-tables and time-table construction, and car dispatching.

The second group of chapters discuss the vital questions of fares and fare-collecting devices and practices. Among the topics treated may be mentioned, riding habit as determined by fare, metal tickets, transfers, reduced class rates, owl-car service rates, free riding for employees and others, fare zones, mileage and commutation books, passenger movement in fare collection, prepayment devices, traffic recorders, and conductors' reports.

The important question of public relations, promotion of passenger traffic, traffic signs, competition, and the freight and express business are the chapter headings of the third group. Courtesy first, service improvement bureaus, making change, co-operation with vehicle owners, public referendums, safety equipment, relations with the press, company publications, the motor bus, the jitney, and the various methods of promoting new business are among the topics which form the contents of these chapters.

The practices, with comments thereon, of a number of companies relative to the selection and training of men, wages and wage agreements, welfare work, discipline of trainmen, and forms of extra pay are set forth in the chapters dealing with the management of the operating forces.

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*Reviewed by D. D. Ewing, Associate Professor Electric Railway Engineering, Purdue University, Lafayette, Ind.

Electric Railway Journal

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RECORDING SERVICE INTERRUPTIONS In connection with attempts by electric railways to sell power to municipalities and large industries located along their transmission lines it has come to our attention recently, in a couple of instances, that the railway companies involved did not have adequate records in regard to the reliability of their service. In consequence they were unable to state definitely what proportion of their troubles was due to their transmission line or to what extent some line betterments they were proposing would be effective in reducing the number and duration of their service interruptions. Our war preparations are only just beginning, but it is becoming increasingly apparent that before they get well under way our factories as well as our transportation systems will be operating under very high tension. Many of these factories are electrically operated, and if they are to perform their allotted tasks their power supply systems must be kept as free as possible from interruptions. For this they depend upon the central station, so that more care than ever should now be taken to maintain this service unimpaired.

POWER TOOLS TO OFFSET LABOR SHORTAGE "On a job for which there was need of sixty to seventy-five men only about twenty appeared." This quotation from F. H. Hill's track article in this week's issue is similar to reports received from all parts of the country, especially from properties located near the large munitions works. Mr. Hill shows clearly that part of the solution of the labor-shortage problem is found in applying power tools to track work. In the reconstruction work which he describes, the pneumatic machines for cutting asphalt paving, the oxy-acetylene torch for cutting off old track bolts, the steam shovel for excavating the trench, the pneumatic tie tampers, the self-propelled concrete mixer and other pieces of power apparatus were rushed in to take the place of the missing labor, with the result that the second stretch of track was rebuilt at almost double the speed of the first stretch. Of the power-driven apparatus used on this job the pneumatic asphalt-cutting tools are the most novel. These have been used on only a few jobs, but the trials have proved so successful that they are about to take their place as one of the recognized standard track tools on jobs involving the tearing up of paving. Their use is not limited to asphalt paving, but they may be used to good effect also in tearing out block paving and concrete foundations. While the merits of the steam and the electric shovel have long been recognized for many kinds of excavation work, these tools are not as common on electric railway track work as they should be. The excavation work described by Mr. Hill was done at about the rate of 40 cu. yd. per hour under favorable conditions, while the average cost of excavating and loading the material on wagons was 13 cents per cubic yard. Not long ago the Connecticut Company reported that its engineers had cut the cost of excavation 66 2/3 per cent by the use of an electric shovel, which also effected a saving of 50 per cent in the cost of teams. Figures such as these indicate conditions which warrant a more general use of labor-saving equipment.

THE SACRIFICE OF HABIT It has been said that the greatest sacrifice that this country will have to make for the war—greater by far than the sacrifice of wealth or comfort—is sacrifice of habit. Whether this is literally true or not, there can be no doubt that the disturbance of orderly routine of life which is even now being forced upon the nation will be sweeping. By far the major part of humanity objects instinctively to change—even to change for the better—when long-standing ideas must be uprooted. This attitude more than any other has prevented the introduction of women conductors on the electric railways of this country in times of labor shortage. While old-style cars were being run and a conductor had to be a combined acrobat, bill collector and police officer, as well as a change clerk, women conductors were an absolute impossibility, but the general introduction of prepayment cars eliminated the three first-mentioned duties. To-day there exists nothing to prevent the employment of women on the rear platform except the mental attitude of a public that has become accustomed to tendering fares on electric cars to men. Under ordinary circumstances this custom would, no doubt, be sufficient to exclude women from the work, but now that the government has taken more than 500,000 men into the Army and Navy and is preparing to draft 1,000,000 more workers from their normal occupations within the next year or two, the public has the alternatives of either sacrificing its habit of mind in regard to male conductors or else doing without conductors entirely. The situation is one that can be very definitely predicted. Even to-day there is not a sufficient supply of male labor properly to man the cars. As further demands are made upon the country's man-power conditions will prove more and more acute, and if male labor cannot be obtained, women must be called upon to fill the depleted ranks. Of course, there is no question that the public will sacrifice its mental habit rather than its car service. Electric railways should begin to break the news to the public now, spreading out opposition over as long a period as possible before the change has actually to be made.

WHEN THE PUBLIC UNDERSTANDS

The Bay State Street Railway seems to have struck a really sympathetic spot in the hearts of its patrons. Its plea for more financial relief has been heeded, and, as we note elsewhere this week, it will probably have a trial period of six months to see what it can accomplish with a general 6-cent fare unit. The Massachusetts Public Service Commission has not yet approved the company's higher schedules, but that is not the fundamentally important even if it is the necessary legal step. The vital point is that the local public—that very public which during the 1916 fare case was so hostile—has become educated to a better understanding of the electric railway situation. The municipal representatives, it should be noticed, have actively co-operated with the company in determining a plan for the trial period. This undoubtedly will impress the commission as a reasonable solution of the company's case. How has all this been accomplished? Simply by adopting a policy of frankly and persistently stating facts and giving evidence of a desire to please the public. There is no royal road to better public relations. But the way is not excessively long or impassable if a utility operator travels it with intelligence and full appreciation of his public responsibility.

SCHOOLING FOR THE PROSPECTIVE MECHANIC

The discussion which has been going on recently in the columns of the *Electrician* of London, England, on the education of apprentices, indicates that conditions in this field in Great Britain are not substantially different from those in our own country. It is very difficult now for a boy to learn a trade in a systematic way, partly because many of the trades are less clearly defined than formerly, and partly because not enough interest is as yet being taken by employers in arranging for the training of boys in such trades as now exist. Our English friends, or at least some of them, believe that boys should, as a rule, leave school at about the end of the grammar grades and go to work under conditions which will stimulate them to learn to think in terms of their daily tasks. The acquiring of useless knowledge is properly deplored, and it is recommended that the studies, to be pursued in shop hours under pay, be in continuation of those begun in school. Such subjects as English, the duty of man to his neighbor and himself, the significant events of history, etc., rather than technical studies, are suggested for these years of adolescence. While we believe thoroughly that a boy headed for the trades should continue through the high school or its equivalent if he is making good use of his opportunities, there are many who would make better progress working under a helpful foreman in a shop. This foreman, however, must have a real interest in the boys' development or they had better be in school. He must have definite plans for them, constituting himself their mentor and friend.

HELP US TELL THE TRUTH

Not long ago the ELECTRIC RAILWAY JOURNAL received an item of interesting information from one of its correspondents concerning the operations of a certain company in an Eastern city, information which was entirely creditable to the management of that company if true. We took the trouble, as we invariably try to do, to approach the company concerned directly to inquire whether the statements set forth in the article were facts. The company immediately replied, with a certain amount of asperity, that the item was partly incorrect and instead of giving the desired information wanted to know from what source we obtained the note.

This experience illustrates an interesting point. Although many companies are making tremendous strides in the development of a publicity policy, some companies still make it extremely difficult for their best friends to tell their story for them. Why should not the management of a company take great pains to tell people of what it is doing? Some managers are inclined to feel as if they were blowing their horn too much if they say much about their affairs. They forget that they are not conducting a personal business. They are, in fact, conducting a quasi-public business—handling funds supplied by the public and rendering a service required by the public. They are therefore required to give an account of their stewardship.

If electric railway managers as a class could really feel deep down in their hearts that the investors in their companies would be pleased above all else at the managers being able to command the confidence of their local communities and the respect and loyalty of their labor, a tremendous change would come over this industry. One of the great difficulties of the business is that so much of the capital in it comes from points outside the community where the capital is used. The business is a local industry, but the capital comes from the money markets of the world. This complication is alike embarrassing to local managers and a constant source of irritation to the local public. Yet it is a fact, inevitable under the circumstances but a fact which should be made an asset with the public rather than a hindrance.

We know of one company which has recently employed a new manager to handle its business in a large city in a neighboring state. The financial backers of his company made this comment upon him: "He is a good, if not a great, operating officer, but above all else, he gains and holds the confidence of the community he serves. You can engage engineering and operating ability in considerable quantity; but the number of managers who really know how to make the public they serve understand them and their company is very, very few."

Does not this situation represent one of the great problems of the electric railway business? Have our managers given enough attention to making their local publics understand them and their companies and their problems? Profoundly as we believe in the fidelity, the courage and the ability with which the electric railways of this country are conducted, we do not believe that the managers have taken enough account of this absolutely vital factor in the success of their business.

As pointed out on another page, the electric railway industry is suffering from an economic disease. Better living on the part of some railways will help the general condition, but in the main the disease can be cured by the public alone. It will be thus cured only as the public is able to make an accurate diagnosis. The public must come to realize that the only possible cure for the disease is to see to it that the electric railways are compensated for the service they render. This lesson in economic pathology is one which can be taught to the public only by the local managers of the electric railways. These men can take no better step in this direction than by arranging to give accurate information to the press and public concerning every phase of their business in which the public may be interested.

WHERE LOCAL ASSOCIATIONS ARE A GOOD THING

Associations which cover a limited section of territory possess some advantages over national associations in handling certain types of problems and in getting quick action from their members and from public bodies. National associations, on the other hand, can by virtue of their representative character exert powerful influence in matters affecting an industry as a whole. Both kinds of associations will get the best results by dividing their work along natural lines.

The endeavor of national bodies to settle purely state questions was amusingly satirized the other day by a veteran electrical engineer in this fashion: Wamba Wumba, delegate from Zululand, in a paper read at the International Humanitarian Congress, declared that the happiness and well-being of the world would be greatly enhanced if the Zulu practices of living in straw huts, eating cocoanuts and wearing nothing in particular were made universal. Strenuous objection to this course was raised by Kama Kamschatka, delegate from North Siberia. In his experience the best style of habitation was a spherical igloo of pure ice, the best food was whale blubber and, as for clothing, three or four thicknesses of seal skin were absolutely essential. Mr. Wamba Wumba's ideas were absolutely fatuous, to put it mildly. Upon motion of a delegate from Mush, the discussion was postponed until next year's convention, largely to avoid the riot which was impending between the adherents of opposing sides.

To bring the matter closer to home it is obvious that a fog test for insulators, of vital importance in California, would not be of much interest in many parts of the country, hence had best be formulated locally. Again, where joint pole agreements are urgently needed the local interests can get together and put plans into operation while the national bodies are struggling with the general problem. This was done around the Golden Gate, where poles are in joint use with circuits of voltages lower than 5000. Still another illustration is furnished by the action of the Central Electric Railway Association in getting together and acting promptly on certain car equipment standards which were greatly needed. All of which goes to indicate that there is plenty of work for vigorous local electric railway associations. In planning their work, however, these should concentrate attention upon their own specific problems, leaving the broad field for the national bodies.

LOSS OF HOME RULE DOES NOT AFFECT PRESENT CHICAGO ARRANGEMENTS

A few weeks ago the Illinois Supreme Court reached a decision which seemed to transfer the regulatory power over the Chicago Surface Lines from the City Council to the State Public Service Commission. To overthrow this decision, the City Council asked the State Legislature to restore jurisdiction to it. Very recently, however, the bill proposed by the City Council was killed when the House committee on public utilities adjourned without taking a vote thereon. This unquestionably leaves the regulation of Chicago's utilities in the hands of the Illinois commission for at least two years, when it may again be possible to introduce the home-rule bill in the Legislature.

Under this control, what is the effect upon the work of the Board of Supervising Engineers—that body which has so excellently supervised the physical properties and the accounting of the surface railways under the 1907 contracts? The answer, we are authoritatively informed, is "practically no effect." The points over which this board has jurisdiction are carefully defined in the city ordinances and in almost every case will be undisturbed by the activities of the State commission. The questions of rate determination, service regulation and capitalization, which are the fundamentals to which the commission will direct its attention, do not come within the local engineering board's supervisory powers.

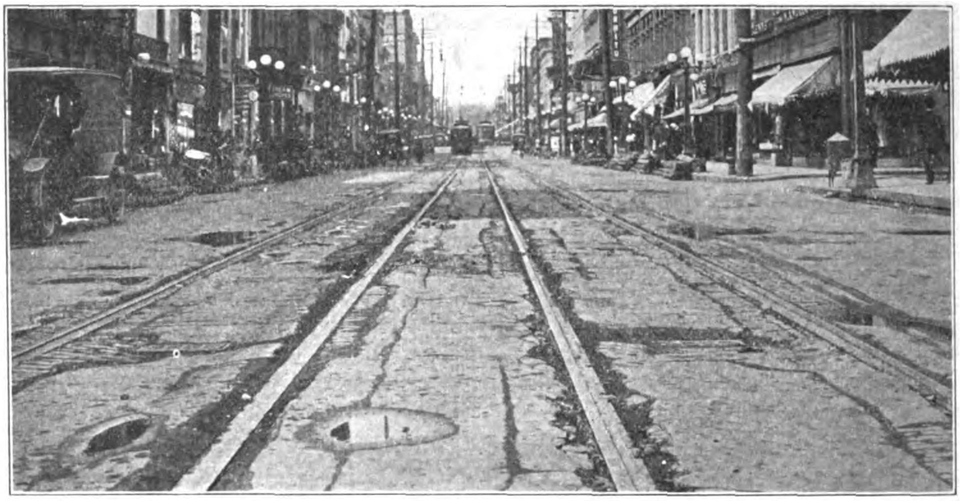
It is just and fitting that a city should exercise through experts a direct administrative supervision over a utility when a partnership agreement has been made, but home rule is by no means necessary for this. The traction ordinance in Kansas City was lately developed in the full light of Chicago experience, and here, by means of the city-and-company board of control, it has been shown how under state regulation a municipality can check operation under ordinance rules and maintain a direct contact with operating details, with receipts and expenses, and with renewals, betterments and extensions. The board of control must take cognizance of any pertinent mandates arising from the superior power of the Missouri commission, but this should involve no duplication of work as long as the local board "sticks to its last."

We see no valid reason why the Board of Supervising Engineers and the Illinois commission cannot work together satisfactorily in this way, thus avoiding the decentralization and the political susceptibility of home rule. We believe the arrangement now in effect has material advantages over the regulatory scheme which would have come with a return of home rule to Chicago. For instance, a fare increase might be granted by the State commission, but it is almost beyond hope that a Chicago City Council would ever do this.

Power Tools Speed Up Track Work

Pneumatic Asphalt Cutting Tools and Tie Tampers, Steam Shovel and Self-Propelled Concrete Mixer Called Out to Help Solve the Labor Problem

By FREDERIC H. HILL
General Manager Elmira Water, Light & Railroad Company, Elmira, N. Y.



ELMIRA TRACK RECONSTRUCTION — FIG. 1 — CONDITION OF TRACK AND PAVING BEFORE RECONSTRUCTION

LESS than two months ago the Elmira Water, Light & Railroad Company completed the reconstruction of about 1900 ft. of double track and paving in connection with which there were employed time and labor-saving devices which enabled us to execute the work with unusual speed and at moderate expense.

LOCATION AND EXTENT OF WORK

The work under consideration was on Lake Street and Water Street in the heart of the retail business section of the city. All cars operate over the tracks which were reconstructed, and vehicle traffic on these streets is also very heavy. Due to the location of the work it was of the utmost importance that it should be pushed with all possible speed. While tracks were torn out not only was traffic on all lines interrupted, with the consequent loss in revenue, but also it was necessary to hold a large proportion of our car equipment out of the carhouse, so that the crippling of a car became a serious matter.

On Lake Street the work consisted in relaying about 550 ft. of double track together with a cross-over and a single-track branch-off. The old construction was 8-in. plain girder rail laid on wood ties without ballast, and the paving consisted of sheet asphalt varying in thickness from 2 in. to 3 in. laid on old Belgian block paving without sub-base.

On Water Street the work consisted of relaying about 1400 ft. of double track, a cross-over, a single-track branch-off and a double track steam railroad crossing. The paving on Water Street was of the same general character as that just described for Lake Street, with the exception that for a short distance the asphalt was laid on a concrete base. The old construction here was 7-in. plain girder rail laid on wood ties without ballast.

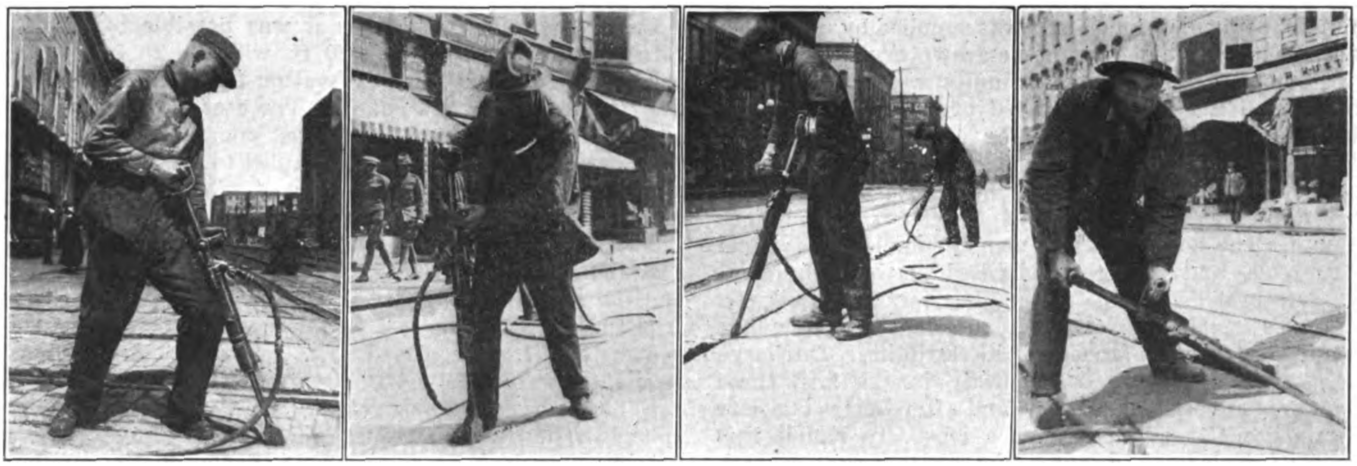
Before any construction was begun, rails, fastenings, ties, paving brick, etc., were distributed along the scene of operations. Rails and ties were distributed from a work car, while two flat cars were used for the 60-ft. rails. The heavy pieces of special work were loaded on a stone drag and hauled to the proper locations by means of a 5-ton motor truck.

The work was begun on Lake Street at 12:30 a.m. Monday, April 2. It had been planned to cut the paving and jack out the track so that excavation could be begun about 7 a.m. On a job for which there was need of sixty to seventy-five men only about twenty appeared, and the progress of getting out track and excavating was so slow that it was most discouraging. The work went on in this manner until Thursday, April 5, when a steam shovel was put to work, and after the men were properly reorganized the work went along very rapidly, so that on Saturday noon, April 7, the excavating was complete. We were further handicapped during this period by cold rains.

It took all the following week to lay rail and repave, so that this section was not completed until Sunday, April 15, a period of fourteen days being required. However, by this time we were well organized with an adequate force of men and tools, and on Sunday at 12.15 a.m. work was begun on Water Street. The condition of the paving before work was begun is shown in Fig. 1, and the work was done in the manner outlined in the following paragraphs.

ASPHALT CUT WITH PNEUMATIC TOOLS

The asphalt paving was first removed from between the rails and for a distance of 24 in. beyond the new line of the outer rails. For this purpose four pneumatic cutting tools were applied in a novel manner. These tools were the standard "Imperial" pneumatic tie tampers, made by the Ingersoll-Rand Company, but they were fitted with special cutting bars, made by changing the shape of the blunt bars used for tamping. This was done by forging the 3-in. by ⅝-in. face of



ELMIRA TRACK RECONSTRUCTION—FIGS. 2 TO 5—SHOWING PROCESS OF CUTTING ASPHALT WITH PNEUMATIC TOOLS

the tamping bar down to an axe-like cutting edge. Another point of difference between the cutting and tamping bar is that the former has a straight shank, whereas the latter is slightly bent.

In beginning the operation of cutting asphalt a notch or shallow groove was first cut along a chalk line drawn at the proper distance from the outer rails and parallel to them. In making this groove the operator slid the cutting edges along the pavement in front of him, guiding the tool with his knee (Fig. 2). It was found that the workman should be discouraged from guiding the tool with his foot (Fig. 3), as this method is slow and there is danger of the operator inflicting serious injury upon himself. After cutting the groove the operator made a series of deeper cuts, leaving 8 in. to 10 in. between cuts, the groove being depended upon to carry the break across these uncut sections. In making this deeper cut the tool was merely placed in the groove, held about vertical and rocked slightly back and forth (Fig. 4). After a few seconds the tool worked far enough into the pavement to enable it to be used as a pry bar, and an occasional prying action (Fig. 5) loosened considerable pavement.

TIME DATA ON ASPHALT CUTTING

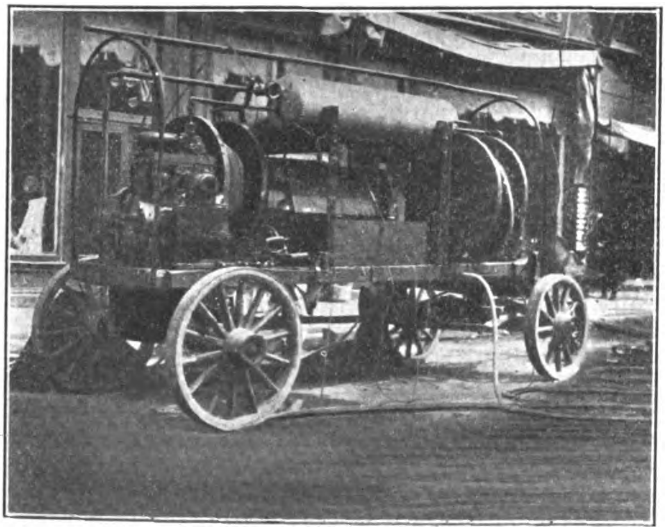
An idea of the cutting speed of these tools can be gained from an observation made while the four tools were in operation, making the outer break in the asphalt. In an hour and one-half a 282-ft. cut was made, which is equivalent to 47 ft. per hour per tool.

In removing the pavement between rails advantage was taken of favorable locations for the cutting, such as along cracks and through thin spots. Good progress was also made by working the tools in pairs. The men faced each other and started the tools down inside of the rails and then pried up simultaneously, thus loosening the pavement from rail to rail. Subsequently the strips were broken up into large chunks. Of course the progress in this varied greatly according to the condition of the pavement, interruptions and the like, but it is safe to say that in a shift of ten hours the average amount of pavement broken up was about 6000 sq. ft. This is equivalent to about 150 sq. ft. per hour per tool. With the aid of a pry-bar the asphalt came up in long strips, which were broken up with mauls into convenient sizes for hand loading.

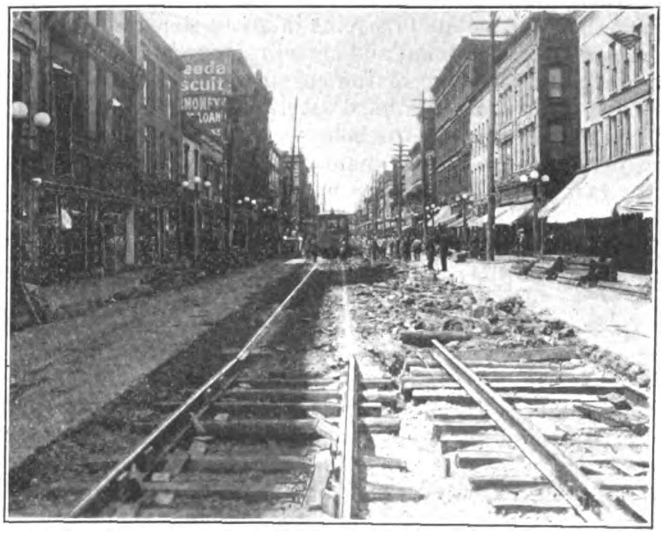
Where concrete occurred under the asphalt it was cut with the aid of tampers fitted with special picks. These picks were made by tapering and tempering a straight shank similar to that of the asphalt-cutting tools. The concrete was cut along the same line as the asphalt, by holding the tool vertically and rocking it slightly. By inserting the tool at intervals of about 6 in. the concrete was broken up readily. The use of the pneumatic concrete picks was relatively a greater saver of time and labor than for cutting asphalt.

HOME-MADE AIR COMPRESSOR

The air consumption of each pneumatic machine is rated at 16 cu. ft. of free air per minute at a pressure



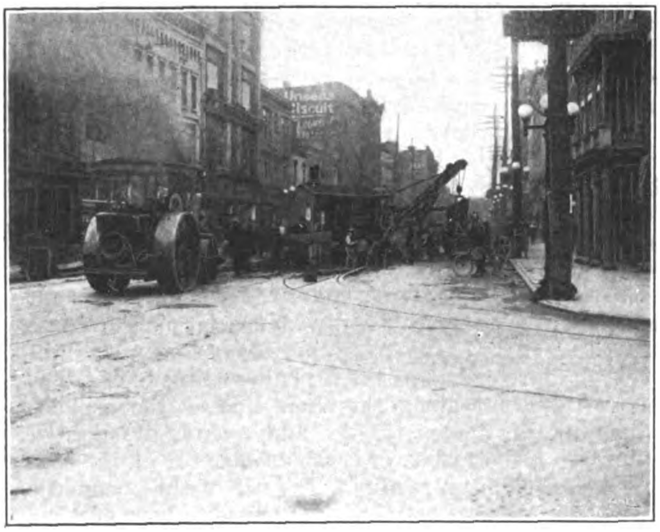
ELMIRA TRACK RECONSTRUCTION—FIG. 6—HOME-MADE AIR COMPRESSOR



ELMIRA TRACK RECONSTRUCTION—FIG. 7—CONDITION AFTER REMOVAL OF RAILS AND TIES FROM ONE TRACK of 70 lb. per square inch. Air was supplied by a portable equipment mounted on a horse-drawn truck (Fig. 6). Two complete air compressor units were mounted on the truck. Each unit consisted of a direct-connected, electric-motor-driven compressor of the type used on electric railway cars, an automatic governor, a receiving tank and 300 ft. of rubber hose. Each compressor had a piston displacement of 50 cu. ft. of air per minute. The hose was conveniently handled on two old wire reels, and a tool box located between the compressors provided room for tamping bars, tools, oil, etc.

It was considered advisable to adopt a double-unit compressor plant on account of its flexibility. Our large construction jobs are done mostly in the first three months of spring and summer, and after that it is a case of numerous small maintenance jobs. To handle this work it is planned to mount the compressors on work cars, so that two jobs can be carried on simultaneously. Also one unit can be used to furnish air in the shop and carhouse.

After the asphalt was broken up, rail jacks were used at intervals of about 30 ft., and with these the old track was raised about 1 ft. through the broken paving. The nuts on the joint bolts were cut off with an oxy-acetylene blow-torch, using equipment furnished by the Oxweld-Acetylene Company. An operator and helper were able to cut the twelve bolts in a joint in about ninety seconds. Hand cutting with maul and chisel required six or seven minutes, and the edge of the chisel was soon ruined on account of striking the hard steel lock washers. After the nuts had been cut, the bolts were driven out and the fish plates loosened with mauls. With the track jacked up a few blows with mauls on a tie served to pull the spikes. The old rails and ties were then removed (Fig. 7).



ELMIRA TRACK RECONSTRUCTION—FIG. 8—STEAM SHOVEL AND STEAM ROLLER AT WORK; STRETCH OF FINISHED TRACK IN FOREGROUND

STEAM-SHOVEL EXCAVATING

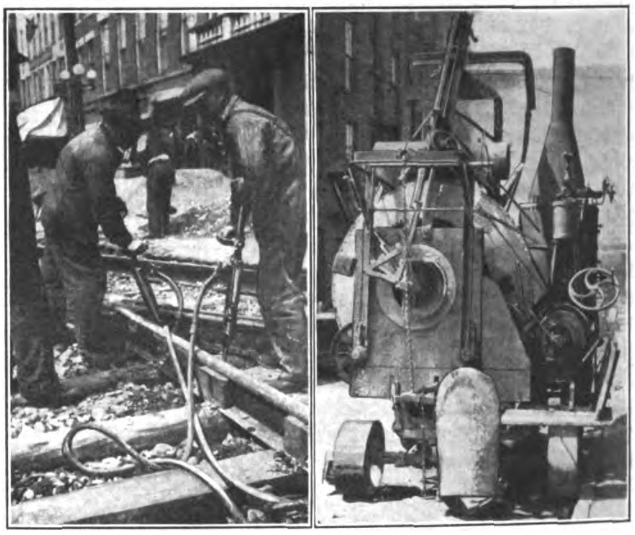
As soon as the first pair of rails and their ties were removed a gang of shovellers began excavating the trench for the new construction. This trench was 20 ft. wide by 20 in. deep. When sufficient length of trench was excavated in this manner a ½-yd. Thew steam shovel (Fig. 8) was run into position, and from there on all excavation except trimming was done by the shovel, the paving blocks and sub-soil being removed by 2-yd. dump wagons. Laborers followed the shovel, trimming the edges of the cut and grading.

Under favorable conditions it was possible to excavate about 35 ft. of trench 20 ft. wide by 20 in. deep per hour, and the average excavation for a ten-hour day was approximately 250 cu. yd. The cost of excavating and loading into wagons averaged about 13 cents per cubic yard. The material was hauled to a dump over a mile from the job, and the total cost of excavating and hauling averaged slightly more than 50 cents per yard.

As soon as the shovel had moved along about 60 ft. a 10-ton steam roller (Fig. 8) was run into the trench and the sub-soil was rolled in readiness for the ballast. After compacting the bed of the trench, oak ties 6 in. x 8 in. x 8 ft. were placed 2 ft. center to center. The new rails were 7-in. Lorain section No. 91-375. One rail of each track was roughly lined in, bolted and spiked. The other rail was then spiked to gage. The spiking was done by a crew of four men. Two, with bars, held the tie up against the rail and the other two drove the spikes with mauls.

BALLASTING WITH PNEUMATIC TAMPERS

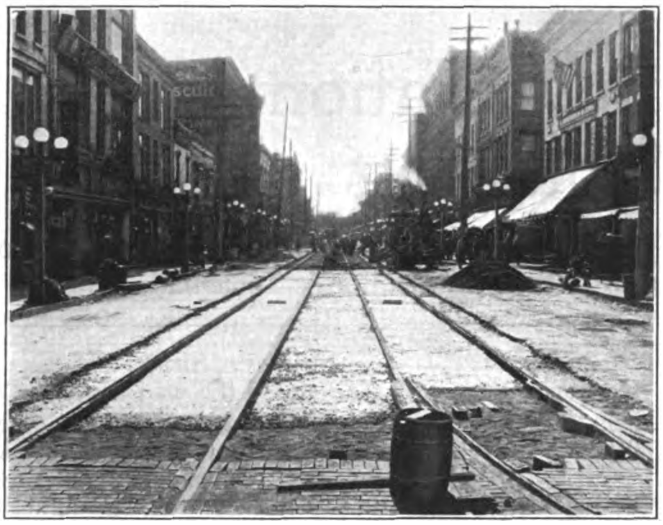
After the spiking was completed the rails were jacked up to grade, leaving space of about 7 in. between the bottom of the ties and the sub-grade. Crushed stone ballast was then shovelled into place and tamped lightly under the ties with shovel and pick. The full length of the ties was tamped with the aid of the same pneumatic tools, which were employed for asphalt and concrete cutting. For this work standard tamping bars with 3-in. by ⅝-in. faces were used with the tools, and the men worked in pairs, one on each side of the tie (Fig. 9). By compacting the ballast from both sides simultaneously none of the force of the blows was spent in shifting the ballast from side to side. Observations made on one section showed that four machines tamped 340 ties in twenty-six consecutive hours. The average time required for two men with the pneumatic tampers to complete the tamping operation of a single tie was from six to seven minutes.



ELMIRA TRACK RECONSTRUCTION—FIGS. 9 AND 10—TIE TAMPING WITH PNEUMATIC MACHINES; SELF-PROPELLED CONCRETE MIXER

In tamping we operated with a gang of five men. The fifth man sounded the ties and watched the grade to see that the work was properly done. He also gave the necessary attention to the compressor plant and tools. Our observations indicate that this five-man gang will do as much work as twenty-four men with picks, and the tamping is better done.

The total time previously mentioned includes all de-



ELMIRA TRACK RECONSTRUCTION—FIG. 11—CONCRETE FOUNDATION, SAND CUSHION AND SPECIAL FILLER PAVING BLOCKS NEXT TO RAILS ON INSIDE OF TRACK

lays incident to the operation. The work was done during a period of high humidity, and considerable trouble was due to the freezing of the tampers. Numerous delays were also experienced on account of men pulling the hose off the connections at the tool. This difficulty was due to inattention on the part of men, and neither this nor freezing was of serious consequence.

While the ties were being tamped the rails were bonded with a Lincoln bonding machine. Coover track braces placed at intervals of about 20 ft. were bolted and then welded to the rail; the welding insured the security of the brace and also improved the cross bonding. Welds were made, using a carbon pencil and scrap copper. Copper wire cross bonds were placed at the end of each section and around all special work.

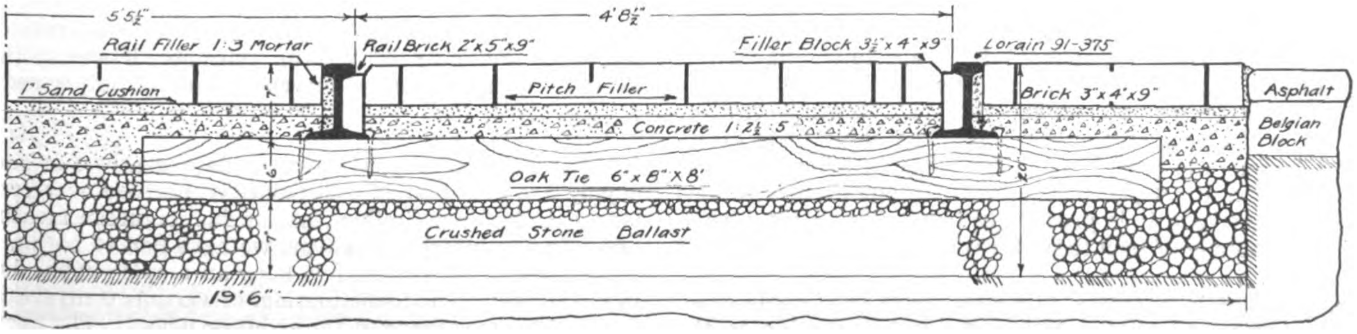
SELF-PROPELLED CONCRETE MIXER USED

After tamping the ballast extended halfway up the ties and the roadbed was ready for concreting. Before beginning to place the concrete Nelsonville filler blocks were first laid against the web of the rails on the inside of the track, and then the concrete was placed to cover the ties a depth of 2 in. Crushed stone and cement were distributed along the street on one side and sand on the other in estimated quantities. A self-propelled ½-yd. Ransome concrete mixer (Fig. 10) was used on the same side of the street as the stone. A gang of about thirty men were able to concrete 50 lineal feet or about 1000 sq. ft. per hour. The completed concrete base is shown in Fig. 11.

The outside of the T-rails was plastered with cement mortar, and then over the concrete a 1-in. sand cushion was placed. This was rolled with a hand roller and graded, giving a final thickness of about 1 in. The bricks were then laid, using Nelsonville block, next to the filler on the inside of the track. A 5-ton tandem roller was used for final rolling. The spaces between the new pavement and the old asphalt were filled with grout, and pitch was used to fill cracks between bricks. A little sand was sprinkled on the brick and the street was then opened to traffic. A cross-section of the complete construction is shown in Fig. 12.

RESULTS OF USE OF PROPER EQUIPMENT

The advantages of suitable equipment and organization are shown clearly by comparing the progress on Lake Street (550 ft. of double track, one cross-over and one single-track branch-off) where fourteen days were required, and on Water Street (1400 ft. of double track, one cross-over, one single-track branch-off and one double-track crossing) where nineteen days were required. The work was carried out by the company's own organization, augmented by laborers and gang bosses temporarily employed for the job. F. G. Maloney, superintendent of the railroad department, had direct charge of the work.



ELMIRA TRACK RECONSTRUCTION—FIG. 12—CROSS-SECTION OF THE NEW CONSTRUCTION

Making the Change to Near-Side Stop Easy for Railway Patrons

A few months ago when the Denver Tramway Company installed the near-side stop throughout the city, it did everything in its power to make this change as easy as possible for the public. In addition to widespread newspaper and company magazine publicity, a white band was painted on the nearest pole at each stopping point. As a still further guide to the riding public, a neatly framed poster was installed on the sidewalk side of each of these poles. This card shows the numbers of the car routes which stop at that location. This was necessary since not all of the cars passing over a certain line stop at every corner. This card gives the number of those routes which do stop at that point and also some general information about what routes run to certain principal points.

NEARSIDE STOP
ROUTES
2
3

NEAR-SIDE STOP POSTER

The Toledo Railways & Light Company, Toledo, Ohio, fittingly observed Flag Day on June 14 by hanging a new American flag, 4 ft. x 2½ ft., on the trolley rope of every one of the 300 cars of the company. As the cars traveled along with the flags waving in the breeze, there was much favorable comment from the people on the streets.

How the Costs of Operation Are Steadily Mounting

Significant Data from Various Parts of the Country Show the Need of Financial Relief for Electric Railways—Business Suffering from an Economic Disaster

By IVY L. LEE

IN the article on this subject last week a general presentation was made of some of the tendencies underlying the street railway business as a whole. It was sought to prove that these tendencies are abnormal and are so undermining the business that, unless heroic measures are taken, inevitable disaster confronts the electric railway industry. No business can continue indefinitely to sell its product at a fixed price if the cost of supplying the product is greater than the price obtained for it.

The point is made in some communities that electric railways are overcapitalized; in others, that the companies have a financial past which is not altogether savory; in others, that the troubles of the companies are due to bad management. It cannot be, however, that these faults are to be found in every company in the country. Yet one may take electric railways almost at random and find the same undermining tendencies at work. Surely this fact indicates that there is something fundamentally wrong with this industry as a business—that the business is suffering from an economic disaster.

The ELECTRIC RAILWAY JOURNAL recently addressed a questionnaire to companies in different parts of the United States, asking for detailed data as to their increased costs of operation. There are published below some significant portions of replies from different parts of the country—sections absolutely independent, surrounded by conditions wholly different, and with stockholders absolutely without relation one to another. These figures show the nature of the economic disease from which the electric railway business is suffering.

A NEW ENGLAND COMPANY

1. The average increase in per cent during the last five-year period, that is, from 1912 to 1917, in:

Cost of Labor:

The increase in the rates of wages granted to various classes of labor since 1912 are practically as follows: Motormen and conductors, 17 per cent; shop men, including car cleaners, average about 35 per cent (this runs from a maximum of 37 per cent granted to common labor to a minimum of 23 per cent granted to painters); line department, average about 40 per cent, and power station operators, average about 38 per cent.

In the track department it is absolutely impossible to give any definite idea, as common labor in this territory is so scarce that the rate paid depends entirely upon the necessity of the job. The actual rate established at the present time for common labor shows an increase of 60 per cent over 1912, but even with this high increase it is practically impossible to get a sufficient supply of men to perform even the most important work.

The high increases, of course, have been made effective more especially during the last year, due to the activity in all branches of industry throughout the territory. Even with these high rates we have not been able to compete with the munitions factories and other profitable industrial enterprises, and have had to take a less efficient class of labor. For that reason the rates do not reflect the actual cost, for while, as might be expected, a less amount of work has been done in certain lines owing to the excess cost of labor and also to shortage of labor, at the same time work performed has not been done in a satisfactory manner, owing to the decreased efficiency of labor as a whole by reason of the high wage payments and also to our inability to compete with the large industries for the most efficient labor in the territory.

Cost of Materials and Supplies:

Something more than a year ago, in anticipation of the very great increase in the cost of material, we laid in an excess quantity of material and supplies, in nearly all instances the quantity being sufficient to cover the requirements for one year. The following is a tabulation of the increased cost of materials used for various purposes:

	Old Price	New Price	Per Cent Increase
Trolley wheel bushings	$0.13	$0.27	108
Track spikes	2.10	3.65	75
Track bolts	2.80	4.75	70
Tie rods	.23	.60	160
English vermillion	.70	4.00	470
Steel wheels	13.50	23.00	70
White lead in oil	6.50	10.50	60
No. 0000 bonding cable	.11	.40	264
General Electric field coils—80	12.51	27.63	120
General Electric armature coils	21.55	34.38	60
Perfection packing	.12	.20	67
Westinghouse field coils—101	20.66	64.03	210
Westinghouse armature coils	23.32	41.02	75
Trolley wire	.19	.38	100
Wire nails	1.50	3.25	116
Machine bolts, discount off list, per cent	75-10	33	200
General Electric 80 gear	$14.13	$28.00	98
General Electric 80 pinion	3.75	8.37	123
Manila rope	.12½	.24	100
Rails	28.00	40.00	43
Rail bonds, per cent discount	40-2½	plus 5	80
Flags	$1.15	$2.00	74

We have tried to select a few items that would cover the general run of materials necessary to use in maintenance of the various items of the company's property. These figures are not the figures at which our stock is carried at present quoted prices. You will note that these run from a minimum increase of 43 per cent to a maximum increase of 470 per cent in various types of material. As near as we can estimate, however, the average increased cost of material is about 60 per cent.

Cost of Fuel:

Contracts which have been made recently for fuel supply are at a rate of 200 per cent increase over contracts made for a similar class of fuel eighteen months ago. In the interim, however, we have had to obtain a large amount of spot coal to keep an ample supply due to the inability, or disinclination, of various contractors to furnish coal arranged for at lower prices. The average increase in the cost of coal during the worst portions of the year has been 360 per cent. If, however, we are able to obtain fuel supply on the basis of our present contracts the increase would be as shown in these data.

It is only fair to say that in this connection we have spent in the past year more than $1,000,000 in modernizing three of our largest power houses in order that the coal consumption per kilowatt output may be materially reduced. In addition to this, we are now carrying on a very active campaign with our motormen with the view to materially reducing the kilowatt consumption per car-mile operated, in this way hoping to overcome, in a large measure, the tremendous increase in the cost of fuel for power production.

Taxes:

Owing to a change in the tax law of the State, whereby assessment is levied by percentage tax on the gross revenue, we have been fortunate in obtaining a slight decrease in tax payment, amounting to 6 per cent. If, however, there is included as a tax obligations put on the company's property for public improvements, such as renewal and reconstruction of pavement, contributions to new bridges, etc., payments for taxes will be materially increased.

2. Figures showing how the part of the nickel covering the total cost of operation has increased in the last five years.

The best statements as to the decrease in the value of the nickel is shown by the increase in the operating ratio, not including taxes, this ratio having risen from 63.66 per cent in 1912 to 68.51 per cent in 1916, an increase of 7.6 per cent. It is needless to say that during this period the efforts of every individual connected with the property have been given to the problem of reducing operating costs.

3. Estimates of losses from jitneys and private automobiles.

It is impossible to estimate this item in a territory such as that covered by this company's property. The jitneys are, without doubt, taking a large portion of our revenue. They are showing a constant increase, there being at the present time 562 jitneys in operation in various cities in this territory as compared to an average of 379 for the year ended April 8, 1916, which is the first year they were in operation on this company's property. Of course, there is a tremendous increase in the number of small automobiles throughout the territory.

AN EASTERN COMPANY

1. The average increase in per cent during the last five-year period, that is, from 1912 to 1917, in:

Cost of labor (platform), 27 per cent in rate per hour; cost of materials and supplies, estimated average increase between 40 per cent and 50 per cent; cost of fuel (power house steaming coal), 73 per cent advance in price per ton; taxes, licenses, etc.: In 1912 they amounted to 9.28 per cent of total operating revenue, in 1916 they amounted to 10.03 per cent of total operating revenue.

Special Expenses Due to Regulation:

The Public Service Commission during the last three years, either by suggestions to the company's officers or after hearing, has ordered improvements which it is estimated have cost the company approximately $750,000.

Cost of Acquiring New Capital:

The rate of interest has not changed materially, but the purchasing power of the money has been shrinking to such an extent as to make increased capital necessary to accomplish a given amount of work. Therefore, the cost of acquiring new capital may be measured in the terms of this increase. *Illustration:* In round numbers, a complete car could be purchased in 1912 for about $5,000, whereas the purchase price to-day for practically the same car is about $8,000.

2. Figures showing how the part of the nickel covering the total cost of operation has increased in the last five years.

Percentage of operating expenses to gross earnings (including depreciation): in 1912, 50.14 per cent; in 1916, 51.08 per cent.

3. Estimates of losses from jitneys and private automobiles.

Jitney traffic started in this city early in 1915. It is estimated that the receipts of the competitive jitneys have, during the last two years, amounted to approximately $150,000, and it is further estimated that approximately $125,000 of this would have come to the railway had it not been for the advent of the jitney.

Private pleasure autos in this city are estimated at 20,000. Assume an estimated diversion of receipts amounting to 20 cents per day from each of these. The estimated total effect per year would be $1,460,000. The total estimated additional amount which the company might have received per year during the last two years, if there had been no competition from jitneys or privately owned pleasure automobiles, is calculated at $1,601,250.

4. Estimate of added burdens under war conditions.

A recent contribution arising under war conditions was $10,000. Salaries being paid former employees who have entered government service is now about $40,000 a year, and the amount is growing daily. Expenses incident to added precautions in the protection of the company's properties will probably amount to $10,000 per year.

The extra expense and inconvenience which we are being subjected to as a result of war conditions, owing to employees entering government service, freight embargoes, deferred deliveries of materials, etc., amount to considerable, but the figure is not readily susceptible of calculation.

A MISSISSIPPI VALLEY COMPANY

1. The average increase in per cent during the last five-year period, that is, from 1912 to 1917, in:

Cost of Labor:

The wages of trainmen have increased 16.59 per cent from 1912 to 1917. During the same period the wages of track department employees have increased 15 per cent.

Cost of Material and Supplies:

	Per Cent		Per Cent
Cement	38	Steel castings	94
Sand	20	Malleable castings	100
Ties	22	Strip brass	216
Rail	20	Babbitt metal	15
Spikes	68.5	Solder	30
Tool steel	78.5	White lead	82
Magnet wire	150	Linseed oil	140
Tape	7	Turpentine	38
Canvas	82	Trolley cord	45.5
Glass	160	Paper stock for printing transfers	48
Trolley poles	58	Wood pole (line poles)	35
Galvanized wire	75 to 100	Iron pole (line poles)	81
Trolley wire	158		
Lumber	25 to 30		

The cost of other supplies has increased proportionately but those cited indicated the trend of prices.

Cost of Fuel:

The average price of coal for the year 1916 increased 23 per cent over that of 1912. For the five winter months ending March 31, 1917, the average price of coal was 104 per cent greater than that for the year 1912.

Taxes:

Taxes for the year 1916 increased 15.03 per cent over the year 1912.

Cost of Acquiring New Capital:

Under the financial conditions from 1912 to 1917 it was impossible to procure new capital for investment in this company. All additions and improvements to the property have been paid for out of the earnings of the property.

2. Figures showing how the part of the nickel covering the total cost of operation has increased in the last five years.

	1916, Per Cent	1912, Per Cent
Gross operating revenue	100	100
Operating expenses (including depreciation)	65	63.38
Taxes	6.50	5.32
Interest charges (bonds)	20	22.01
Miscellaneous	2.13	.52
Net income	6.37	8.77

The operating expenses (including depreciation) for the year 1916 increased 5.82 per cent compared with the year 1912.

The average fare per passenger for the year 1912 was 3.38 cents and 3.22 cents for 1916, a decrease of 0.16 cent or 4.7 per cent.

3. Estimates of losses from jitneys and private automobiles.

In this city the jitneys are probably not earning more than $500 per day. We have lost in receipts, owing to the increasing use of private automobiles, from $3,000 to $4,000 per day.

4. Estimate of added burdens under war conditions.

We consider the war conditions responsible for the present high prices of all materials. The present agitation for enlistment is making it very difficult to hold our skilled men and to get new men. The abnormal conditions on account of feverish activity in certain lines has largely robbed us of our skilled men, and has created a feeling of unrest among all of our employees.

A NORTHWESTERN COMPANY

1. The average increase in per cent during the last five-year period, that is, from 1912 to 1917, in:

Cost of Labor:

The average daily wage paid all employees of all departments of this company during the year 1916 was 22.3 per cent greater than during the year 1912. For employees in the transportation, rolling stock, and way and structures departments, the average daily wage in 1916 was 20 per cent in excess of the average wage in 1912. The average wage of trainmen during the first three months of 1917 was 14 per cent in excess of the average wage during the first three months of 1916. The wages of all other employees increased by approximately the same percentage during this period.

Cost of Material and Supplies:

Items constituting approximately 90 per cent of the total purchases made for the railway department during 1915 show that $1,000 worth of supplies purchased in 1915 could have been purchased in 1910 for $775, and would have cost in April, 1916, and December, 1916, $1,180 and $1,410 respectively.

Cost of Fuel:

It is not possible to give a very accurate figure covering the cost of fuel during the years 1912 to 1916, inclusive, as the conditions under which our fuel has been purchased have been changed from time to time. At the present time, however, our coal is costing us 59.8 per cent more than it did last year, and we estimate that this will increase the cost per kilowatt-hour for current used by the railway by about 36 per cent. The figures shown in the table under Question No. 2 do not indicate the full effect of this increase in the cost of power, as during the earlier months of this year we were using coal which had been purchased on earlier and more favorable contracts.

Taxes:

The taxes paid in 1916 were 36.8 per cent greater than those paid in 1912. During this period the tax rate increased 24.8 per cent, the balance of the increase in taxes being due to increase in assessment.

2. Figures showing how the part of the nickel covering the total cost of operation has increased in the last five years.

	Calendar Years, First Three Months		
	1912, Per Cent	1916, Per Cent	1917, Per Cent
Operating revenue	100.0	100.0	100.0
Ordinary operating expenses (including depreciation)	61.8	67.0	74.1
Taxes	7.0	6.5	7.0
Amount available for return on investment	31.2	26.5	18.9

From 1912 to 1916 the amount available for return on investment decreased from $0.312 per dollar of revenue to $0.265 per dollar of revenue, or by about 15 per cent. The first three months of 1917 showed a further decrease in the amount available for return on investment to $0.189 per dollar of revenue, and bearing in mind the fact that during the first part of the year certain materials were purchased on 1916 contracts, and the further fact that the full effect of wage increases has not yet been felt, it seems to us likely that the amount available for return on investment for the calendar year 1917 will be substantially less than $0.189, and not unlikely as low as $0.150.

3. Estimates of losses from jitneys and private automobiles.

During the year 1915 the losses due to competition from jitneys were probably in the neighborhood of $500 a day. At the present time losses due to jitney competition are probably about the same in amount as they were during 1916, or somewhat less than in 1915. The increasing use of private automobiles has, we believe, increased the total loss due to the operation of motor vehicles to an amount in excess of what it was in 1915. The latest available figures which we have indicate a yearly loss, due both to jitneys and private automobiles, amounting to between $800,000 and $1,000,000 a year.

4. Estimate of added burdens under war conditions.

High prices of labor and materials are probably to a considerable extent due to the war, and we anticipate that these prices will probably be further increased in the coming months. The high wages offered semi-skilled workmen in the mechanical trades and the unusual advantages offered to agricultural labor are serving both to limit the number of men seeking employment and to cause some of our older employees to leave the service. Up to the present time we have not lost any considerable number of trainmen by enlistment. It is likely, however, that within a few months the situation will have developed so that a considerable percentage of the men will have entered military service. This, together with the fact that the mechanical trades are offering large inducements, serves to decrease both the quantity and quality of available labor. We also anticipate serious burdens from special taxes.

A COMPANY IN THE MIDDLE WEST

1. The average increase in per cent during the last five-year period, that is, from 1912 to 1917, in:

Wages of car men have advanced approximately 25 per cent from 1912 to 1917; wages of trackmen, 44½ per cent, and wages of shopmen and car men, 40 per cent, Fuel costs have advanced 200 per cent in the last five years. The increase in taxes has been 79.99 per cent. The cost of acquiring new capital in the last five years has advanced 5½ per cent.

2. Figures showing how the part of the nickel covering the total cost of operation has increased in the last five years.

The operating ratio in 1912 was 70.50, and in 1916 58.30. This apparent anomaly is due largely to the increased density of the riding population and to peculiar local conditions obtaining in the years mentioned.

A PACIFIC COAST COMPANY

1. The average increase in per cent during the last five-year period, that is, from 1912 to 1917, in:

Cost of labor, 9.37 per cent; cost of materials and supplies, 20 per cent; cost of fuel, negligible; taxes, 15 per cent; special expenses due to regulation, 53 per cent; cost of acquiring new capital, none obtained.

2. Figures showing how the part of the nickel covering the total cost of operation has increased in the last five years.

The average increase in total operating expenses to total revenues has been 8.1 per cent.

3. Estimates of losses from jitneys and private automobiles.

These losses have been 25 per cent.

4. Estimates of added burdens under war conditions.

No percentages are available, but the following items figure in these added burdens: Employees joining colors; inability to secure competent men to take their places; wage increases; increased cost of materials and supplies; car shortage, which has crippled normal freight movement.

A SOUTHERN COMPANY

1. The average increase in per cent during the last five-year period, that is, from 1912 to 1917, in:

The cost of labor is 30 per cent greater now than five years ago. Our own costs are controlled not only by prices of crude materials, but also by our degree of alertness toward favorable market conditions. Being consumers, our materials and supplies may reveal cost figures quite different from those of other consumers, the element of timely buying being one of considerable importance here. The following rough percentages of increase have been deduced from our own experience:

Copper wire is 50 per cent over the 1912 price, though it was rather high that year; car wheels show a 5 per cent increase, which came on us just this year; brakeshoes, 200 per cent increase, recorded during the last twelve months; motor repair parts, controller parts, lamp parts, etc., about 40 per cent; creosoted pine poles, 75 per cent increase; chestnut poles, 30 per cent increase; steel rails, more than 30 per cent increase; fastenings and points, 75 per cent; lumber, 25 per cent; pole-line hardware, 45 per cent; trucks, 50 per cent; motors, 50 per cent.

We have been protected by contracts on fuel cost, which is a small item with this company, our power being hydroelectric. Due to car shortage in recent months, however, we have had to go into the open market for some fuel and have been compelled to pay as high as 100 per cent increase.

Our tax payments are 36 per cent higher now than five years ago. This will be increased, of course, by war taxes not yet levied.

2. Figures showing how the part of the nickel covering the total cost of operation has increased in the last five years.

Our operating costs have gone from about 50 per cent of our gross income from street railways to about 60 per cent—exclusive, of course, of taxes and interest.

3. Estimates of losses from jitneys and private automobiles.

Losses in receipts, due to jitneys and private automobiles, are estimated at not less than $1,000 a day.

New York Annual Meeting

The New York Electric Railway Association Holds Brief Session and Listens to Discussion on Higher Fares

IN accordance with the practice being followed by other electric railway associations, the New York Electric Railway Association decided some weeks ago not to hold a two-day annual meeting of the usual kind. Instead, the members met at the Hotel Astor, New York, on the morning of June 27 and finished its annual meeting in about an hour. After the regular meeting, Joseph K. Choate, chairman of the committee on higher fares, and Thomas Conway, Jr., Ph.D., of the University of Pennsylvania, Philadelphia, addressed the members of the association on the kind of data which would be required in completing the case which the railways will present to the Public Service Commission, Second District, in their plea for higher fares.

At the regular meeting of the association, a vote was passed authorizing the continuance of the regular committees of the association.

Secretary and Treasurer W. F. Stanton reported cash on hand at the beginning of the year, $3,084; received during the year, $7,452; disbursements, $6,265; balance on June 27. 1917. $4.270.

The committee on nominations, consisting of six past-presidents of the association, presented the following nominations, which received the unanimous approval of the members.

President, Wilbur C. Fisk, president and general manager Hudson & Manhattan Railroad, New York.

First vice-president, Charles F. Hewitt, general manager United Traction Company, Albany, N. Y.

Second vice-president, E. A. Maher, Jr., assistant general manager Third Avenue Railway, New York.

Executive committee: W. O. Wood, Long Island City; T. C. Cherry, Syracuse; H. B. Weatherwax, Albany, and James E. Hewes, Rensselaer, N. Y.

The only paper presented at the meeting was the annual address of the retiring president. An abstract of this address is given in the following paragraphs:

ADDRESS OF PRESIDENT BARNES

The New York Electric Railway Association is holding this its thirty-fifth annual meeting under the most critical conditions that our country and our industry have ever seen. For the first time within the association's experience of our present membership our country is confronted with war, and war under such conditions as it has never seen, even during Revolutionary days. Corporate and patriotic duties confront each one of us with an intensity and variety such as to leave room for little else, and least of all for the social and light-hearted features with which we have been accustomed to surround our annual conventions. With this thought in mind, your executive committee has felt that the usual annual convention of this association would be out of keeping with the spirit of the times and has decreed instead a brief business meeting for the single purpose of continuing the life and enlarging the usefulness of our association from a strictly professional standpoint. As the meeting is to be brief, so will your president's address be, confining itself merely to a review of the important features of the association year just completed.

Considering first the activities of the association which are directed toward the problems of the nation, your committee on military operation, which reported so splendidly and effectively at the Niagara Falls convention a year ago, has been continued, and the services of your association have through this committee been offered to the National and State governments, and in co-operation with the American Electric Railway Association and other sectional associations to whatever extent and in whatever direction our association or its membership may be used. It will interest you to know that the officials of the Home Defense Board of the State of New York, who are concerned with any transportation problems which may confront the State administration, have expressed interest and gratification in the data which your association has compiled and have announced their intention of availing themselves of the operating organizations of your member companies should the occasion require.

Your committee on standards has accomplished much of a formulative nature in co-operation with the committee on standards of the American Electric Railway Engineering Association and should in the course of the next year be able to report definite recommendations of great value to the member companies.

The committee on taxation and rates of fare has found itself through the logic of circumstances superseded by the work of a committee under the chairmanship of your past-president, Joseph K. Choate, inaugurated through the agency of your association but extended to include non-member companies. This committee has already filed petitions with the Public Service Commissions, setting forth the need of increased revenues and petitioning for the right to make additional charge for service. Predictions as to the outcome are idle, but if thorough, earnest and conscientious effort can achieve the result, then this committee will work out the salvation of our industry in New York State.

As time goes on, and as this country is drawn more closely into the conduct of the great war, new problems will arise to confront the industry. Already many of our men from all branches of the service have answered their country's call, and the problem of filling the ranks of our workers is becoming daily a more difficult one. We must soon, if we do not already, confront the problem of choosing our policies as companies in this important question of keeping full the ranks of our workers so as to serve our resident population in the best possible manner under the changed conditions which we are entering. The use of women in various branches of the service must have our careful consideration, and this consideration should be early, so that when the necessity arises a definite policy as to this employment may be announced. A uniformity of policy among all companies in this matter would be highly desirable.

As we go daily more deeply into the rapidly changing problems which confront us, let us not forget that association and discussion among ourselves is one of the surest means to an understanding and wise solution of our problems, and let us here resolve that the New York Electric Railway Association shall be now, more than ever before, dedicated to its purpose of making us, by interchange of opinion and by investigation and discussion, not only better railroad men but better Americans.

How the War Will Affect Utilities

Henry G. Bradlee Says that Present Situation Will Require All the Ingenuity of Utilities to Meet It Successfully—Suggests Women Operators and One-Man Cars

An analysis of the situation facing public utilities has been made by Henry G. Bradlee, president Stone & Webster Management Association, Boston, Mass. Summarizing the conditions which he believes will prevail during the war, Mr. Bradlee, in the June issue of the *Stone & Webster Journal*, says in part:

"It appears that we may have for the first time in our experience, and continuing during the entire period of the war, a combination of conditions somewhat as follows:

"1. An unprecedented shortage of labor, materials and supplies, and consequently an abnormally high price for those actually available.

"2. No new capital available for extensions and additions to property.

"3. A condition of general industrial activity and prosperity with consequent demands for additional service.

"It is difficult to imagine a more difficult combination of circumstances for a public utility, and it will require the combined ingenuity of the utilities to meet this situation successfully and furnish satisfactory service to the public. The utilities must devise ways and means to hold down their demands for labor and capital, and above all they must, if possible, find some way to provide for increases in business without making any material increase in plant."

Besides urging companies to make a careful study of the most effective use of employees to make up draft deficiencies and to discontinue all operations which can be dispensed with without loss of efficiency or impairment of service, Mr. Bradlee makes the following suggestions:

"The employment of women in the place of men who enter the army or leave for any other cause should be carefully considered. Experience in England and in Canada shows that women may be employed to great advantage in many departments of public utility work. They have been found particularly efficient, it is said, in some of the lighter mechanical work—for example, meter repairs and adjustments.

"The increase of one-man operation of cars should everywhere be encouraged. In England women have been very generally substituted for men as conductors, and it is understood that they are also being used successfully as motormen. In this country one-man operation is already started and has demonstrated its possibilities even on large double-truck cars. We are satisfied that all street railways will gradually change to one-man operation for most, if not all, of their business, and by so doing will be able to improve materially the service rendered the public. Such change at this time will meet our present needs and will be in line with probable future development. One-man operation may, therefore, be considered far preferable to the use of women as conductors.

"An effort should be made to decrease the peak demand on public utility plants and to increase the load factor. As the war progresses, the public will obtain a much clearer knowledge of the needs of the situation, and undoubtedly the utility companies will be able to secure the co-operation of their customers and of the public authorities in their efforts to readjust the demand for peak-load service.

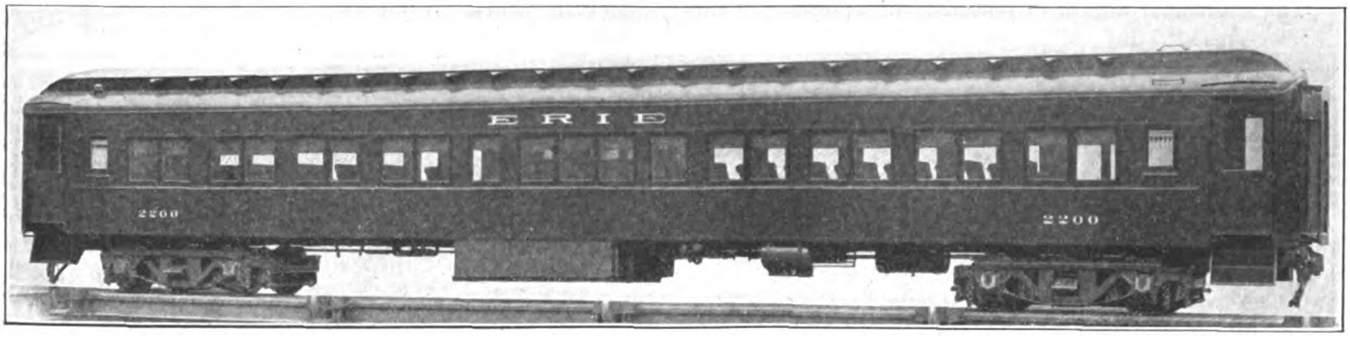
"Renewals and replacements will have to be postponed in so far as this can be done without serious detriment to the service and without permanent injury to the property. This should be done because the cost of all such work at this time is excessive and because the surplus which the utility companies are able to accumulate from earnings may be the only fund on which they can draw for absolutely necessary additions to the property.

"Careful consideration should be given to the study of rates. With the constantly increasing costs of all labor, materials and supplies, general increases in rates may be necessary to permit the companies to carry on business and serve the public. The necessity for an increase in street railway fares is now being urged in many sections of the country, and the public is beginning to realize that some readjustment must be made or service will be seriously impaired."

Non-Telescoping Car for the Erie

Provision Against Disastrous Effects of Collisions Has Been Made by Tying the Sides Together at Floor and Roof with Heavy Plates Connected by Vertical Beams, Making a Complete Box Frame for Either End of the Car

A NEW design of all-steel car recently built for the Erie Railroad presents an especially interesting study because of the notable advance in structural strength that has been effected, the car body having been designed with particular reference to resisting destruction in collision or derailment. This is accomplished by the introduction of two new members in the body end, namely, an anti-telescoping tie member consisting of a heavy plate extending across the car from side wall to side wall and about 5 ft. 6 in. lengthwise of the car, and forming a flat ceiling for the lavatory, passageway and saloon, together with special end-door posts in the form of vertical 21-in. beams. These beams are thoroughly framed into the center sills and to the anti-telescoping plate above with connections capable of developing the full strength of the beam.



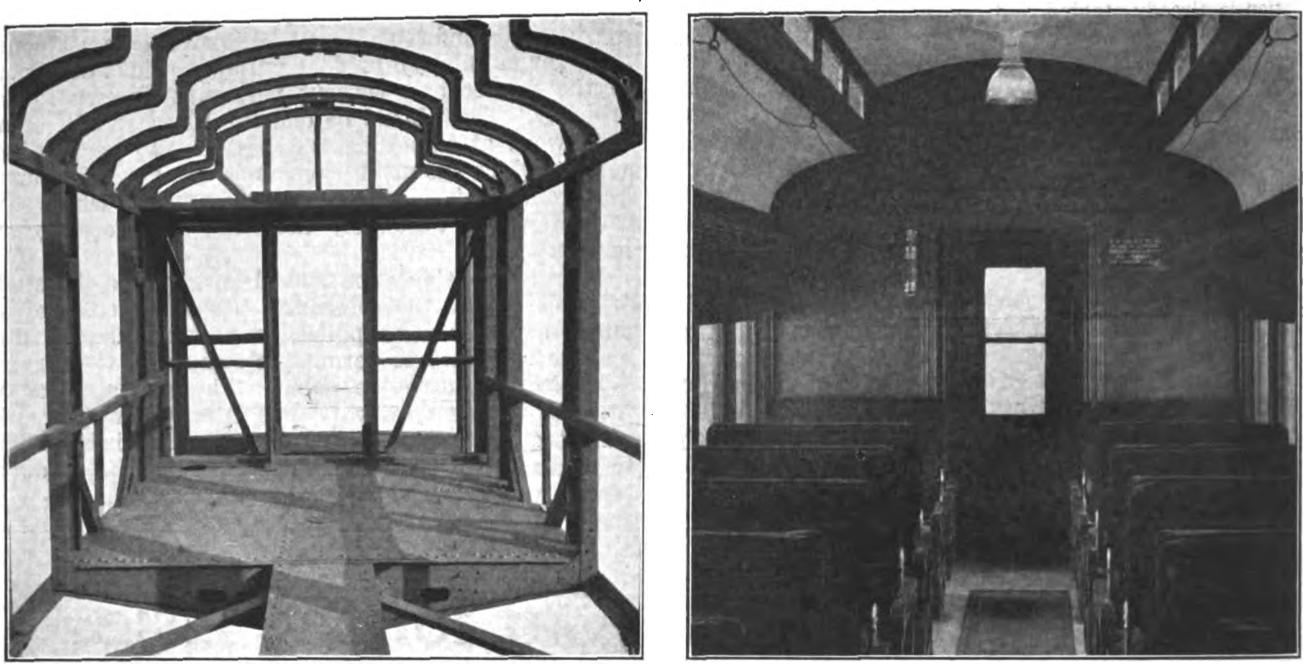
NON-TELESCOPING CAR—EXTERIOR VIEW, SHOWING GENERAL FEATURES

The truss-side-frame construction, which has been used, affords in itself much greater security in the passenger space than is possible with the usual side-girder construction with light side posts and roof, and when to this construction are added the new features incorporated in the latest Erie cars, the result is a structure providing far greater protection against telescoping of the car body than any heretofore produced.

In one of the illustrations on page 1186 the arrangement of the protective members is clearly shown. This is a reproduction of a perspective drawing made to illustrate the manner in which the anti-telescoping plate ties the side walls together at the roof line, and how the heavy door post beams and their backing constitute at each end of the car an anti-telescoping bulkhead of great strength and serve to intercept a colliding body. The vestibules of the Erie cars are of the usual construction and are obviously less capable of resisting impact shock than is the heavy body-end construction. Consequently, if the Erie car is subjected to a violent collision, the vestibule structure may be expected to close up against the body of the car and in doing so somewhat cushion the force of the blow.

Further progress of the colliding body will be greatly checked, if not arrested, by the heavy end construction, and it is confidently expected that the anti-telescoping bulkhead, if generally adopted, will very greatly reduce, if not eliminate, that most common and most destructive feature of collisions—the telescoping of one car by one of its neighbors.

This design is the result of six years' study of the effect of collision or derailment upon cars—particularly all-steel cars—through personal inspections and examinations of photographic records. The inevitable conclusion from examination of such a series of photographic records as are preserved, for example, by the Interstate Commerce Commission, is that the heavy underframe so generally used in steel passenger cars not



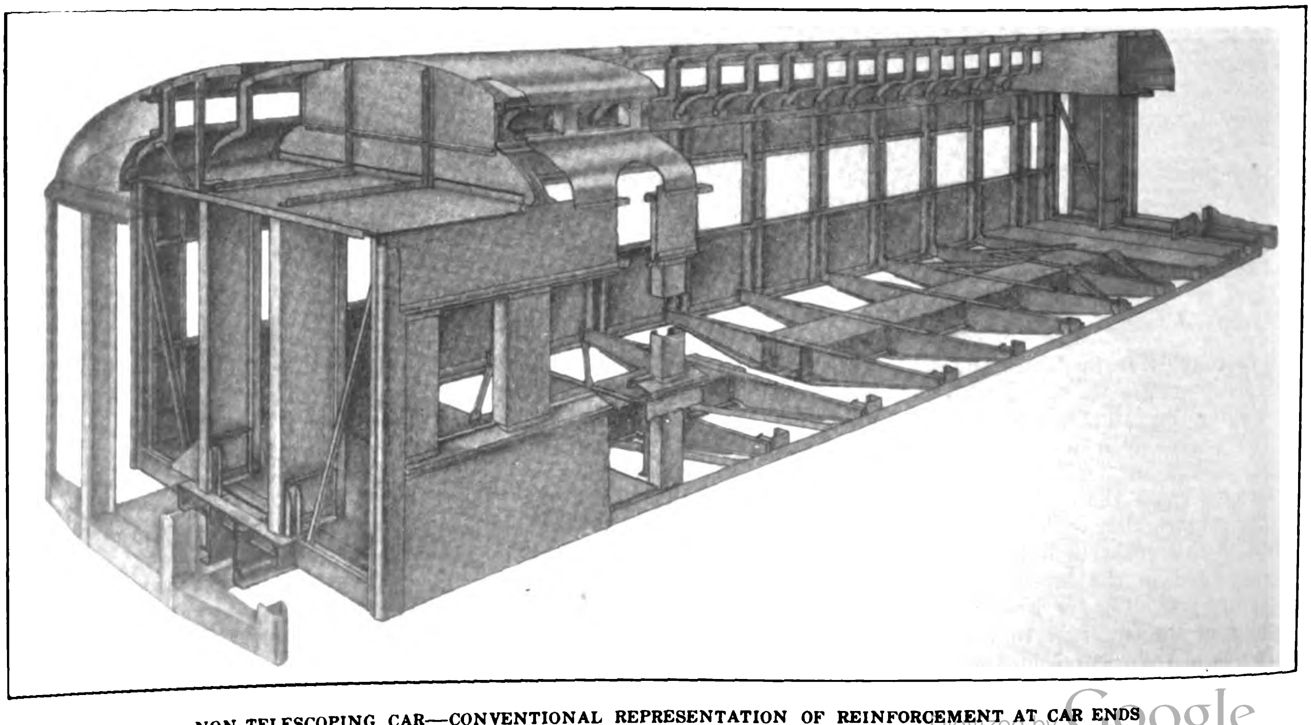
NON-TELESCOPING CAR—INTERIOR VIEWS OF END REINFORCEMENT WHEN UNDER CONSTRUCTION AND IN COMPLETED CAR

only affords little protection against damage in derailment or collision, but in themselves not infrequently increase the damage to life and property, owing to their excessive weight. In case of collision the underframe of at least one car is usually raised at one end above the floor of the adjoining car and, when this occurs, the greater weight and strength of the underframe, as compared to the superstructure of the neighboring car, makes it particularly effective in destroying that superstructure.

This characteristic failure of superstructure when subjected to collision shock has been recognized for several years, and it is to prevent or minimize this destruction, caused by the penetration of one car body within another, that the system of body end reinforcement of the superstructure, as adopted by the Erie Railroad Company has been devised.

The additional weight of material incorporated in this heavy body-end structure is more than offset by the reduction in weight effected elsewhere by the truss-side construction. The complete weight of the car, including trucks but excluding lighting equipment, is only 111,000 lb.—materially less than the weight of the wooden cars with steel underframes now used by the Erie. The length is 78 ft.

For the new cars the framing system is similar to that employed in the Erie suburban cars described in the ELECTRIC RAILWAY JOURNAL for June 12, 1915, except that the windows are rectangular, whereas the window openings of the suburban cars are Gothic. In each case, however, the side sheathing, posts and letterboards, composing the full height of the side walls, are framed together into a truss and act as a load-carrying member. This form of construction produces a structure free from appreciable deflection and without tendency to "work" at joints.



NON-TELESCOPING CAR—CONVENTIONAL REPRESENTATION OF REINFORCEMENT AT CAR ENDS

At the bottom of the side frame of the car is an angle side sill 4 in. x 3½ in. x ⅜ in. The main side posts, or piers, are on approximately 5-ft. 11-in. centers. These piers are "C"-shaped pressings, 12 in. wide x 4⅞ in. deep. The upper member of the side frame, corresponding to the letterboard, is a pressed channel 5¼ in. x 3/16 in. The bracing of the piers is accomplished by riveting to the side sheathing and to the belt rail below the windows, and by the letterboard and upper belt rail above the windows. This method of construction produces a load-carrying truss 7 ft. 7 in. in height by 70 ft. long, with suitable openings for windows, as compared with the usual construction having a plain girder 3 ft. high and 70 ft. long below the window sill.

On the center sills, which are composed of 12-in., 25-lb. channels, is a top cover plate, and the two sills, including bottom flange angles, provide a total area of 27.9 sq. in. The center sills are supported and aligned by the side frame through the body end sills, the bolsters and a number of cross-bearers, which occur at every main pier, or at 5-ft. 11-in. intervals. This, in effect, produces a compression member stiffened by flanges that are 7 ft. in depth and eliminates all possibility of deflection of the center sills in a vertical plane. As a means for bracing against horizontal deflection there are incorporated twelve diagonal braces which extend from center sills to main piers at the cross-bearers. These diagonal braces, with the side sills and cross-bearers, form a horizontal truss brace for the center sills, 9 ft. 9½ in. wide.

Double body bolsters are provided, the upper member consisting of a plate ¼ in. thick. Forward of this cover plate is a floor plate extending to the front edge of the body end sill. This floor plate securely ties together the side sills, end sills and center sills, co-operating with the diagonal braces in preventing any possible horizontal deflection of the underframe.

The roof of the car has been made to co-ordinate with the upper portion of the side walls in such a manner as to act effectively in combination with the previously mentioned anti-telescoping tie member. This resists compression stresses and protects the passenger space in case of overturning of the car through derailment.

MISCELLANEOUS DATA

The seating arrangement of these cars conforms to that of the other Erie cars now in through-line service, in that they are fitted with a smoking compartment which seats twelve passengers in the middle of the car. The walls of the compartment are fitted with leaded glass windows. Seats in the smoking compartment are upholstered in leather, and those in the end compartments are finished in Erie standard plush. The seating capacity of the car is seventy-six, including the twelve seats in the smoking compartment. Each end of the car is fitted with a saloon and lavatory.

Illumination of the car is obtained by ten incandescent lamps set on the center line of the ceiling. The power for lighting comes from an 800-amp.-hr. Wilson storage battery with lead-lined cells. The capacity of this outfit is sufficient to furnish light for the run from Jersey City to Chicago and return without recharging.

The general dimensions of these cars, which were built by the Pressed Steel Car Company, are as shown in the following table:

Length over vestibule end sills	78 ft. 0 in.
Length over vestibule body end sills	70 ft. 0 in.
Wheelbase of trucks	8 ft. 0 in.
Height of car over all	14 ft. 3 in.
Weight of car body	80,660 lb.
Weight of two trucks, including clasp brakes	30,240 lb.
Weight of car without storage batteries	110,900 lb.
Storage batteries, boxes and hangers	8,700 lb.

The general features of the equipment were selected by F. D. Underwood, president Erie Railroad, and the cars were designed under the direct supervision of William Schlafge, general mechanical superintendent of the system, by the firm of L. B. Stillwell, consulting engineers.

Six-Cent Fare Asked in New York State

Twenty-eight Street Railways Outside of New York City File Petitions with Second District Commission for Financial Relief

TWENTY-EIGHT street railways in New York State, outside of the metropolitan district, joined on June 25 and 26 in filing petitions with the Public Service Commission for the Second District asking for an increase in fare from 5 cents to 6 cents. Virtually every city of any size in the State, except New York City and Buffalo, would be affected if the applications for relief should be granted. A conference on the petitions will be held before the commission on July 6.

Similar printed petitions were sent in by these companies: Albany Southern Railroad; Corning & Painted Post Street Railway; Elmira, Corning & Waverly Railway; Elmira Water, Light & Railroad Company; Fishkill Electric Railway; Fonda, Johnstown & Gloversville Railroad; Geneva, Seneca Falls & Auburn Railroad, Inc.; Glen Cove Railroad; Hornell Traction Company; Huntington Railroad; Ithaca Traction Corporation; Kingston Consolidated Railroad; Northport Traction Company; New York & Stamford Railway; Ogdensburg Street Railway; Poughkeepsie City & Wappingers Falls Electric Railway; Waverly, Sayre & Athens Traction Company; Orange County Traction Company; Peekskill Lighting & Railroad Company; Putnam & Westchester Company, and the Hudson River Traction Company.

The petitions of these companies stated that even the increase of 1 cent would be insufficient to yield reasonable compensation; that the increase was arbitrarily adopted because the reports filed with the commission showed without question that it should be granted immediately. The present condition, it was said, is not due to the war, but is the result of a steady tendency, the effect of which must be counteracted or general insolvency, bankruptcy or even dissolution and abandonment, in many cases, must result.

Each petition claimed that after all expenses were deducted from earnings "there will remain so insignificant an amount that if only a mere nominal value be assigned to the property used in the public service, the return will be much less than 8 per cent, which your petitioner believes is the minimum rate of return which will be sufficient to attract the capital required to enable it to comply with its obligations to the public."

Petitions which differed in some respects from the foregoing were received from the Auburn & Syracuse Electric Railroad, Empire United Railways, Inc., Hudson Valley Railway, New York State Railways, Schenectady Railway, United Traction Company and Westchester Street Railroad. In the case of these companies the Public Service Commission was asked not only to grant the 6-cent fare, but to permit the railway proportionately to increase "rates, fares or charges for such other transportation business as may be performed by it," meaning freight and express rates for the most part.

The United Traction Company, Albany, asked not only for a 6-cent fare but also for a 2-cent transfer charge and a double-fare for owl-car service. After presenting detailed revenue and expense statistics in its petition, this company said:

"From Jan. 1 to June 1, 1917, the revenues have increased over the corresponding period of the previous year, but the excess of revenue has been more than offset by the increase in operating expenses. Unless the revenue for 1917 is increased it will be insufficient to pay expenses, making impossible any improvement or extension to the service which is being constantly demanded by the public.

"The decrease in revenues is largely caused by the increased use of automobiles and by auto bus service, and from the fact that there has been no material increase in population. The great increase in operating expenses is caused by the acknowledged increase in the price of labor and materials, assessments for municipal improvements and taxes. There is no immediate prospect of increasing the amount of travel on its lines, or in decreasing the amount of its operating expenses and other disbursements, and relief can come only by way of increased charges for transportation."

In speaking of the petitions, Joseph K. Choate, chairman of the New York Electric Railway Association committee on ways and means to obtain additional revenue, is quoted as saying:

"Of course, the commission will want to consider the case of each particular company, and the individual companies are preparing special facts for detailed presentation to the commission. But there are certain unusual facts underlying the whole industry which apply to one company quite as much as to another. If the companies are to be permitted to maintain a standard of service in accordance with the continual improvements in the art; if they are to be able to extend their service in accordance with the needs of growing communities, it will be absolutely necessary also to deal with the situation as a whole.

"The fundamental fact in the whole situation is that we are not increasing the price of our service. The purchasing power in labor, materials, etc., of the 5 cents paid for the service is so seriously decreased that we are compelled in the interests of our service to attempt an equalization. Even a 6-cent fare under present conditions will not be as valuable to the companies as a 5-cent fare was five years ago."

Cities Favor Six-Cent Fare for Bay State

Tentative Agreement for Trial Period Reached by Company and Municipal Representatives—Commission Approval Expected

A TENTATIVE agreement between the Bay State Street Railway and representatives of Lynn, Fall River and other important municipalities served by it as to a fare increase for a six-months' trial period was reached at a conference with the Massachusetts Public Service Commission in Boston on June 21. As stated in the ELECTRIC RAILWAY JOURNAL of June 2, page 998, the commission recently gave the company permission to reopen its 1916 fare case, this step being taken in view of the company's contention that at least $1,489,000 additional revenue is needed yearly.

The tentative agreement now reached with many of the most important municipalities on the system as to the necessity of at least a trial period for a fare increase is likely to lead the commission to approve the proposed changes in tariffs and to obviate the protracted hearings which were a feature of the case last year. Some of the company's most determined opponents of 1916 are now in favor of granting a measure of relief through temporarily increased fares. Such difference of opinion as has appeared has been based mainly upon the terms of the plan in regard to the sale of tickets.

The plan devised at the conference includes a general increase in the fare unit from 5 cents to 6 cents in all the present 5-cent fare zones of the system. By the 1916 decision of the commission the fare unit in the rural and outer suburban districts was fixed at 6 cents, that in the cities remaining at 5 cents. It is now proposed to make all basic fare units 6 cents, supplementing this charge, however, in the city districts by the sale of tickets in books at the rate of 5 cents per ride, with free transfers as at present. The company desires to sell books of twenty tickets for $1 without any time limit, the tickets to be used interchangeably when accompanied by the cover. The company also desires to charge the full 6-cent fare on Sundays, holidays and on Saturday afternoons after 1 o'clock. Some protests were raised as to the institution of the higher fare at the end of the week, but Chairman McLeod said that the time might easily come when an advance of 1 cent in the cost of a street car ride would be a very small factor in the increased cost of outings under war conditions. In general, transfers would be good only within city limits. For the present school children would be charged 3 cents per ride under the new arrangement.

Third Avenue Hearing Continued

June 28 Session Given Up Mostly to Discussion of Valuation—Staten Island Lines Ask Six-Cent Fare

THE 2-cent transfer charge hearing for the Third Avenue Railway, the first of the New York City companies to have its petition for relief taken up by the Public Service Commission for the First District, was continued on June 28. The chief point discussed was the value of the property.

The company had submitted as evidence the physical valuation made by the commission as of Sept. 1, 1909, in the 1910 capitalization case. This involved a valuation figure of $35,100,000 for reproduction cost less depreciation. The city opposed the use of this figure now, on the ground that it is not applicable to a rate case, where only used and useful property instead of all owned property should be considered. The commission seemed to feel, however, that the 1910 inventory was competent evidence, subject to proof as to the listed property being in public service.

The 1910 valuation was made under the direction of E. G. Connette, president United Gas & Electric Corporation, who was at that time transportation engineer for the commission. Testifying in the present case, Mr. Connette said that, if all the property listed in 1910 except real estate is in existence to-day, the present cost of reproduction new (with prices averaged over 1914, 1915 and 1916) will be considerably more than that on Sept. 1, 1909. He was not allowed to state whether in his opinion appreciation since 1909 has been sufficient to offset depreciation.

It was brought out by commission counsel that in the later Manhattan transfer case, Mr. Connette determined the non-operating and non-useful property as of July 31, 1911, to be $7,222,758, and that Mr. Floy, the company's expert, fixed the figure at $6,083,212. The hearing is to be continued on July 9.

The Staten Island & Midland Railway and the Richmond Light & Railroad Company, which control the surface lines on Staten Island, have asked the commission for permission to charge a straight 6-cent fare. It is said that relief must be granted to allow the companies to operate at a profit.

Schedule Boards for Patrons

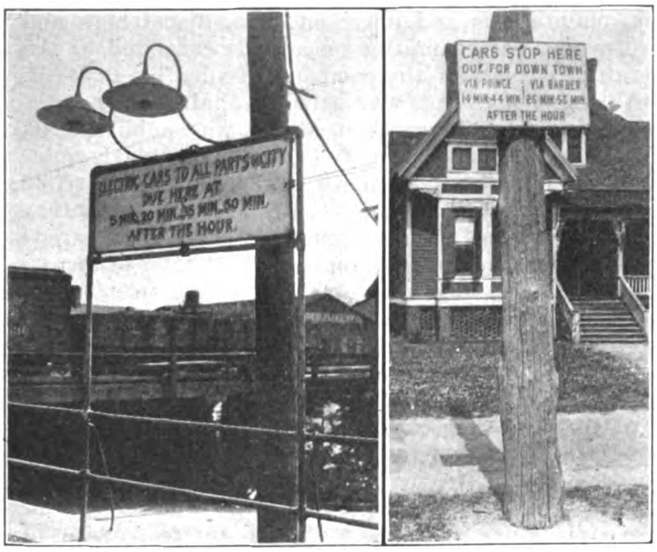
Displaying of Schedules at Street Intersections Has Proved a Success in Athens, Ga.

BY ROSS L. BAKER

Electrical Engineer H. L. Doherty & Company, New York, N. Y.

ALTHOUGH the application of new business principles to the gas and electric business is causing these branches of public utility operation to grow beyond all bounds, the application of those principles to the railway business has been sadly neglected.

A radical departure has been made by the Athens Railway & Electric Company, Athens, Ga., a subsidiary of the Cities Service Company, in the adoption of a schedule board for location at each street intersection along the company's lines. Examples are shown in the accompanying illustration. These boards, so colored as to attract attention, are attached to the electric railway poles. They should be attached so as to overhang the street, and lettered on both sides so as to be visible from both sidewalks, and, if possible, one block off. The lettering on the boards simply states at the top, "Cars Stop Here," and underneath, "Car Due Northbound," at certain "minutes after the hour." The last phrase is at the bottom of the board. In a parallel column with a "Northbound" column is a "Southbound" column with a minute schedule after the hour.



EXAMPLES OF SCHEDULE BOARDS SUCCESSFULLY USED IN ATHENS, GA.

The Athens boards are experimentally made of wood. They should, by preference, be made wholesale of brightly colored enameled metal, the only painting by hand being the figures for the minute for any given block on the schedule.

These boards have been so successful that no one in the Athens company, from the manager to the motorman, would dream of abandoning them. The advertising value has been very high, and the boards have been very favorably commented on by strangers.

These schedule boards take into account, in a high degree, the psychology of the patron. He comes out of the house in the morning desiring to take a car to town, but there is none in sight. Ordinarily he would stand and wonder whether a car had just left, and how long he would have to wait for the next one. The schedule board sets his doubt at rest, and discourages his usual habit of starting to walk to town and continuing to walk after once started. Becoming familiar with the schedule board through seeing it daily, the patron will soon leave his house just in time to meet the car when due.

The schedule board is particularly needed on a car line having an irregular schedule and one hard for the patron to remember. It is a troublesome process for many men and women to add even easy numbers to twenty-two minutes or forty-three minutes, for instance, after the hour any time during the day and arrive at the time when a car is due. They will not make the effort. Moreover, if the patron desires to take a car from some other corner than the one with which he is most familiar, he is utterly at sea as to when the car is due, or, if he stands along an unaccustomed route, as to how often the car is run. The same feeling is experienced by everyone when standing on the corner in a strange city wondering where the cars go and when.

The schedule board is recommended for any street car line having a headway of ten minutes or longer. It may be located every other block, if the blocks are short. It serves as a motorman's running schedule, and makes a schedule clock for the motorman unnecessary. An accurate watch, however, should be located in a padded compartment, where it will be constantly before his eyes.

An objection which was at first offered to the use of the schedule board is that the rush-hour traffic morning and evening makes it impossible to keep a schedule during those hours. If such is the case, this comes to be well understood, and does not affect the usefulness of the board during about sixteen hours out of eighteen. Another objection has been the possible delay in schedule caused by the holding up of cars at railway crossings. If this is a frequent occurrence, the schedule board can qualify its figures by calling attention to this fact in small print at the bottom.

An interesting development of a schedule-board system would be large illuminated signs overhanging the business district, telling what car line to take to get to interesting parts of the city, such as baseball parks, theaters, depots, colleges, etc., or a large illuminated city map with the car routes shown in colors and interesting points of the city prominently featured.

Employees' Club in Portland, Ore.

The employees of the Portland Railway, Light & Power Company, Portland, Ore., have formed a social club under the name of Employees' Social Club of the Portland Railway, Light & Power Company. The purpose of this club is to handle all social activities of the company. The officers elected for the ensuing year are: B. F. Boynton, who is claim agent of the company, president; C. E. Wagner of the light and power department, first vice-president; Mrs. J. A. Mickelson of the Piedmont division, second vice-president; Stacey Hamilton of the commercial department, temporary secretary. The executive committee consists of Mrs. F. E. Amos, Mrs. W. M. Smith, C. F. Gabler, R. Walker, O. Glenn, H. N. Hall, R. W. Simeral, M. Gay, Miss Rhea Joslyn, R. R. Robley and M. B. Grenfell. It is the announced purpose of the organization "to give the employees and their families a royal good time during the year."

It is significant that the electric utility companies under the management of H. M. Byllesby & Company serve twenty-two municipalities which have, in the past, operated their own generating stations. In every case the municipality has found power purchased from a central station to be more economical than if generated in a city-owned plant, more reliable and efficient, or both.

COMMUNICATION

Illinois Passenger Rates Established by Legislature

EAST ST. LOUIS & SUBURBAN RAILWAY COMPANY
EAST ST. LOUIS, ILL., June 19, 1917.

To the Editors:

In a news note in your issue of June 16, you refer to the rate dispute between the steam railroads and the State of Illinois, and say: "The State bases its right to injunction upon the decree of the Illinois Public Service Commission, which permits only a 2-cent rate." The law creating the State Public Utilities Commission of Illinois specifically provides that the commission shall not allow a charge greater than 2 cents per mile. The commission has not, I understand, on its own account made any ruling prohibiting railroads from charging more than 2 cents per mile, but has simply declined to permit a greater charge than this for the reason that the law creating the commission specifically prohibits it from doing so.

I thought you might be under the impression that our commission had made some investigation tending to show that 2 cents per mile is sufficient. As a matter of fact, there has been no occasion for such investigation for the reason just stated.

T. W. GREGORY, Assistant Treasurer.

AMERICAN ASSOCIATION NEWS

2462 Subscriptions to Liberty Loan on Chicago "L"

At the meeting of the Chicago Elevated Railroad company section held on June 19 announcement was made that employees had subscribed to $175,500 in 2462 subscriptions. Britton I. Budd, president of the company, addressed the meeting, among other things expressing his appreciation at the outcome of the Liberty Bond campaign. He discussed particularly the subject of team work, its value both to the individual and to the organization, and showed how the ability to get along amicably with his fellow-workers is one of the most valuable assets that man can possess. He demonstrated also that the workers who are keeping the country's industries alive are contributing to the welfare of the country even if they cannot go to the front. Mr. Budd's address was followed with music and amusing recitations. Lieut. M. W. Bridges, former secretary of the section, also spoke with reference to the army. The meeting was attended by 150 members and guests.

Concrete Discussed at Milwaukee Meeting

The speaker at the regular meeting of the Milwaukee Electric Railway & Light Company section, held on June 14, was E. A. Dolan, district engineer Portland Cement Association. The topic was "Concrete and Its Uses." In his address, Mr. Dolan took up the history of concrete, citing a number of cases in which concrete had been used in crude form several thousand years ago. He showed pictures of the first cement mills in this country and also of up-to-date mills, illustrating the stages through which the material must pass from its crude state to the finished product. He also showed a number of colored slides illustrating the different uses that can be made of concrete. In the discussion following the talk, Mr. Dolan answered a number of questions relating particularly to concrete paving and track foundation. A buffet lunch and smoker followed the formal meeting, which was attended by fifty members.

Interesting Westchester Men in Safety

Distribution of a Safety Pamphlet and a Prize Contest for Ideas Have Been of Benefit

WITH the idea of establishing practical interest in the safety-first movement among the employees of the New York, Westchester & Boston Railway, the company recently distributed among them a pamphlet entitled "The World's Greatest Battle," together with an invitation to submit a short written statement covering (1) that picture in the pamphlet which best illustrated the type of accident most liable to happen in the employee's department; (2) the avoidance of such accidents, and (3) suggested changes or improvements on the company's property tending to decrease accidents in general. A prize of $5 was awarded to the employee in each class of service who submitted the best answers. These classes were made up of office clerks, trainmen, station forces, shopmen, track and building men, linemen, maintainers and telephone men, dispatchers and towermen. The committee on awards consisted of the operating officials of the company, headed by P. W. J. Smith, superintendent, who acted as chairman.

The pamphlet in question, which was published by R. J. Bodmer, Washington, D. C., was particularly notable for the extremely realistic and extremely horrible reproductions of the results of accidents, the author stating that it was written from the workingman's angle —not as a reading proposition, but as a matter of mental impression. According to Mr. Smith's statement practically all of the employees got the impression.

Among the prize winners interest appeared to center on subjects of trespassers, attention when operating switchboards, the maintenance of ladders and the risk of getting clothing caught in machinery. The latter brought about a very definite suggestion on the part of the prize winner in the shop forces, to the effect that counterbalanced belt shifters should be used on all belt-driven machines and that a control for the motor of each motor-driven machine should be close to the operator at all times. Other definite improvements were suggested in connection with the operation of trains at points where pickups of cars are made, these being brought up by the prize-winning trainman, together with comments on other phases of operation wherein a tendency toward carelessness had been growing up on the property.

Forestation Venture by I. T. S.

The Illinois Traction System, Peoria, Ill., has to date planted 30,100 catalpa trees along the company's right-of-way. It is proposed to continue this forestation from year to year with the idea of securing a portion of the ties and fence posts used by the company from its own groves. At the present time these catalpa groves are located at points south of Lincoln and Benld, east of Oakley, west of Cerro Gordo and north of Springfield. The trees are set out on extra right-of-way where they will not interfere with train operation. They vary in height from 18 in. to 24 in. With average growth they should be available for fence post use in about eight years and should be large enough for ties in about ten years. Brief mention of the plan of the company to carry out this work was made in the ELECTRIC RAILWAY JOURNAL of April 28, page 796.

Equipment and Maintenance Section

Railway Men Should Get the Benefit of the Other Man's Ideas and Give Him the Benefit of Theirs by Reading This Section and Contributing to It

One-Man Safety Car Made from Old Box Car for $700

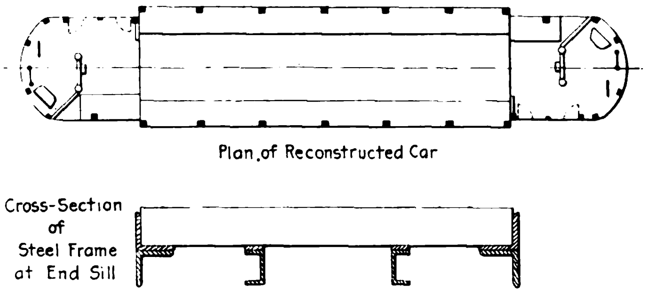
Old Body Was Set in Steel Underframe, Platforms Were Lengthened and Car Was Rehabilitated Generally

BY H. E. WEYMAN
Master Mechanic Levis County Railway, Levis, Province Quebec, Canada.

The Levis County Railway has recently put into very successful operation its first two remodeled "safety" one-man, double-end cars, and its experience with the rejuvenated cars has been so satisfactory that others will be added later. The company had on hand some concave-side, box-type, single-truck cars, about fifteen years old, which were considered good enough to form the basis for modernized cars. They had, of course, small vestibules, bulkheads, etc., as was customary when they were built. The appearance of the old cars is shown in the reproduction of a photograph of one of them, and another photograph shows the present appearance of the two remodeled cars. The principal features of reconstruction were the steel underframes and the lengthening of the vestibules, although all of the details were brought strictly up to date. The work was done under the direction of the writer with the hearty co-operation of A. K. MacCarthy, general manager of the company. The cost for labor and material was approximately $700 per car.

The first operation was the building of the steel underframes, the members of which were as follows: Side sills of 4-in. x 4-in. x $\frac{3}{8}$-in. angles, end sills of 3-in. x 5-in. x $\frac{3}{8}$-in. angles; cross beams of 7-in., $17\frac{1}{4}$-lb. channels; outside knees of 4-in. x 4-in. x $\frac{1}{2}$-in. angles; inside knees of 4-in., $7\frac{1}{2}$-lb. channels; bumper beams of 3-in. x 5-in. x $\frac{3}{8}$-in. angles. Scraper beams were also attached to the platform knees. The underframe was assembled and riveted together ready for sliding under the box body. It was designed so that the body could be dropped into it without removing anything but the vestibule knees. In other words, the plan was to inclose the old wooden underframe in the steel one, the two to be connected firmly together with angle plates and bolts. After the new underframe was in position the vestibule and body posts were connected to the steel frame by angles riveted at the frame, and when necessary the side posts were connected to the steel frame by angles. Before the new underframe was placed the old vestibule knees and cross beams, which were much the worse for wear, were removed. After the underframe was placed the old vestibules were cut at the body and moved out 15 in., and new pieces of roof were built in. The vestibule bulkheads were cut out, and arches of angle iron, continuous from sill to sill, were inserted to support the ends of the body.

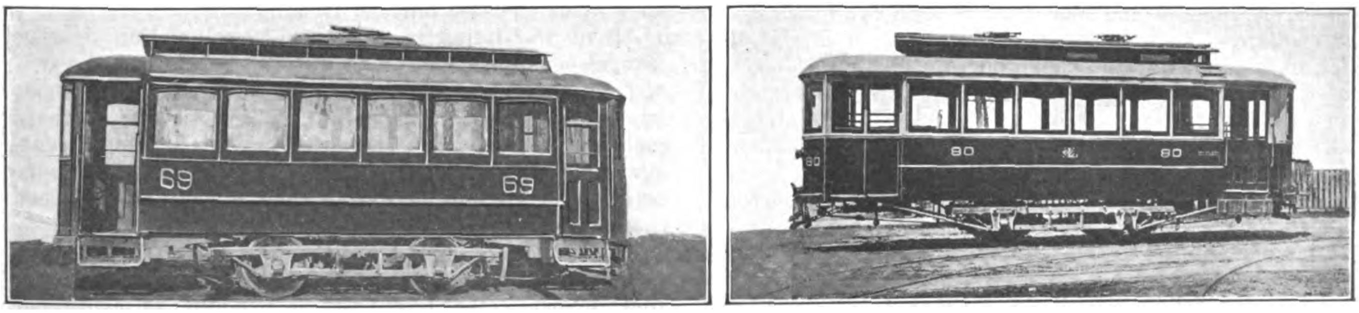
On the right-hand side of each vestibule folding doors replaced the old-style hand doors, and folding steps operating automatically with the doors were installed in place of the old stationary steps. The handles for operating doors and steps were placed near the controllers.


Plan.of Reconstructed Car
Cross-Section of Steel Frame at End Sill

GENERAL PLAN AND CROSS-SECTION OF NEW UNDERFRAME OF LEVIS COUNTY RAILWAY REMODELED CAR

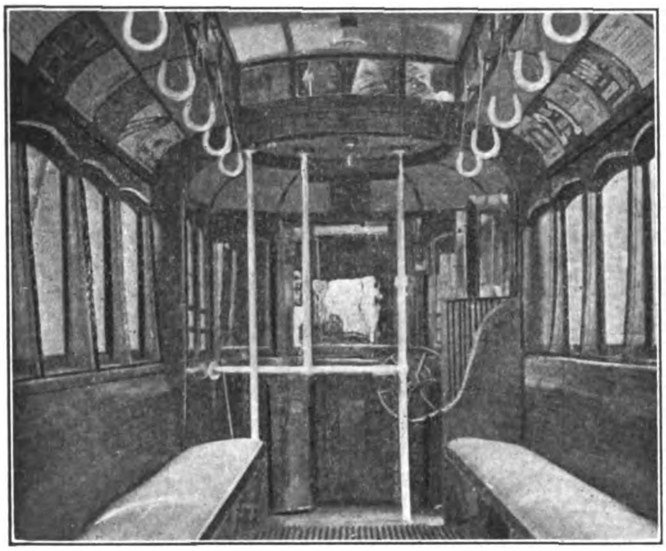
The interior of the car was improved by substituting longitudinal seat frames built up of angle-iron for the old wood-inclosed frames, with reduction in fire risk. The new arrangement is also more sanitary, as it is easier to keep the floor clean. On the side of the vestibule opposite to the door a seat for two persons was built in, and on the door side a folding seat was placed, permitting full utilization of the vestibule when the door is not in use. All of the seats were covered with rattan.

With a desire to have a perfectly sanitary car, all of the old grooved and cut moldings were removed and replaced with plain ones. Incidentally this greatly improved the appearance. Rico sanitary strap hangers, push buttons and buzzers, Consolidated car heaters and Atchley staffless brakes were among the devices which we added to make the car as worthy of the name "safety" car as possible. Railings were erected on the platforms to separate the operator from the passengers and also



LEVIS COUNTY RAILWAY CAR BEFORE AND AFTER REMODELING to serve as a support for the fare boxes. Two vertical railing posts were carried clear to the ceiling to serve as guides for the curtains provided to protect the operator from the light behind him. The new arrangement of lamps consists of seven single ones down the center of the car, one in each vestibule, and Golden Glow headlights, one operating at a time. Safety car lighting fixtures were used throughout. All of the wiring was inclosed in flexible or pipe conduits. Finally the car was given an attractive interior finish in mahogany, with cream-enameled ceiling and railings.

The remodeled cars are in operation along the south shore of the St. Lawrence River opposite Quebec. They connect with the Quebec ferry service, which is on a fifteen-minute headway during the summer and a thirty-minute headway during the winter. There is considerable congestion at rush hours, but the cars have handled the business nicely. The company has a total of 14 miles of track, 8 miles of which run west along the river to the now world-famous Quebec bridge. The track is all single and there are grades up to 12 per cent. Unfortunately there are a number of stub-end lines necessitating double-end operation and this required the use of double-end cars.



INTERIOR VIEW OF REMODELED LEVIS COUNTY RAILWAY CAR

Two-Car Train Unit Being Tried Out in New York City

Two-car train operation is being tried out by the Third Avenue Railway of New York City. The experimental unit is made up of two of the company's 43-ft. pay-as-you-enter motor cars, each having a seating capacity of forty-five. The rear door of the front car and the front door of the rear car are used for loading and unloading. The front door of the front car is also used for unloading, but the rear door of the rear car is not used. The three doors are interlocked with the control so that the cars cannot be started until the doors are all closed. The unit is in charge of one motorman and two conductors.

The control equipment consists of a master controller which operates two Westinghouse PK control heads which are applied to the regular type K controllers with which the cars were already equipped. Power for the master controller circuit is furnished by an 18-volt storage battery.

When Does It Pay to Splice Up Scrap Feed Wire?

A Little Algebra Practically Applied Furnishes the Answer—The Author Gives His Experiences on the United Railroads of San Francisco

BY S. L. FOSTER
Chief Electrician United Railroads of San Francisco

In these days of high cost of copper feeder cable its efficient use becomes more important than ever. Hence, in splicing up short pieces of feeder cable, or in fact any copper wire, the question often arises as to how short a length of conductor it pays to splice up rather than to throw it into the scrap. The matter is usually decided arbitrarily by an "educated guess," but it can easily be calculated exactly, as the length in feet of the shortest piece of conductor that can economically be spliced up equals the quotient obtained by dividing the cost of making one splice by the loss per foot sustained in selling weatherproof cable for scrap copper.

The proof of this statement is as follows:

Let $a =$ pounds per foot of new insulated conductor.
$b =$ pounds per foot of same conductor without insulation.
$c =$ cents per pound paid for new insulated conductor.
$d =$ scrap value in cents per pound of bared conductor.
$e =$ number of feet in shortest piece worth splicing.
$f =$ cost in cents of one completed splice.

Then $ac =$ cost of insulated conductor per foot in cents.
$bd =$ selling price of bared conductor per foot in cents.
$bd \div ac =$ portion of a foot of insulated conductor purchasable from proceeds of sale of 1 ft. of bare conductor.
$1 - (bd \div ac) =$ lacking portion of the foot yet to be bought.
$ac[1 - (bd \div ac)] = ac - bd =$ cost in cents of this lack per foot or cents lost per foot on cable sold as scrap.
When $(ac - bd)e = f$, the loss in scrapping the wire will equal the cost of one splice.
or $e = f \div (ac - bd)$.

For example, if a wrapped cable type splice in a 500,000-circ. mil feeder costs $2.21, this same conductor with double-braid weatherproof insulation on it costs 26.5 cents per foot new, and the bare copper sells as scrap for 17 cents per foot. Then $e = 221 \div (26.5 - 17) = 23.3$ ft., the shortest piece that it would pay to splice up.

If the splice had been made with a brass connector and cost only $1 it would have been economical to splice up a piece of cable only 10 ft. long.

All of the items in this simple calculation deserve careful consideration. The difference between the cost of new insulated cable and the scrap value of the copper in old cable is fairly constant in peace times, both in cash and in percentage of cost new, but while percentage remains nearly constant there is a wide difference between peace and war-time cash differences between these two items.

In 1904 double-braid weatherproof 500,000-circ. mil cable cost 15 cents per pound or about 26.5 cents per foot, whereas the bared scrap brought 11 cents per pound or about 17 cents per foot. Here the difference was 9.5 cents. To-day with new weatherproof at 41 cents per pound and scrap at 28 cents this difference amounts to about 29 cents per foot.

This comparison shows how much more extravagant it is for electrical men to be careless in the use of copper conductor when the price is high than when it is low. In 1917 the difference between the new and scrap prices per foot (29 cents) was 40 per cent of the cost of the new cable; in 1904 the difference was 36 per cent.

The cost of a splice in 500,000-circ. mil cable depends on how and by what priced men it is made. In San Francisco a 500,000-circ. mil splice is made with a one-piece brass sleeve connector, costing 52 cents in 1917, without shortening of the cable and with a minimum of labor, solder and tape. It is almost always made on the ground and can be handled by ground men just as well as by high-priced linemen. In Eastern practice the wrapped-cable type splice usually made, and which is always made by linemen, involves a shortening of the cable by 2 ft. (1 ft. at the end of one cable bared, unlaid, scraped and matched into the similarly prepared wires of a foot of the other cable end). Then about twice as much solder and twelve times as much money for labor are required. On actual competitive tests in San Francisco the Eastern wrapped cable splice in 500,000-circ. mil cable cost 12.4 times as much for labor as the San Francisco sleeve splice. The finished wrapped splice cost $2.21 and the one-piece brass splice 94.5 cents, considering labor and material, in 1904. In 1917 the costs in San Francisco would be $3.47 and $1.01 respectively on account of the rise in cost of copper and solder.

From these figures it is seen by applying the formula derived earlier that the least length of 500,000-circ. mil cable that it would pay to splice up in 1904 would have been 23.4 ft. by the wrapped cable-type splice, and 10 ft. by the San Francisco connector splice. In 1917 the least length by the former would be 11.94 and by the latter 3.4 ft.

If shorter pieces than the above are spliced up, the cost of splicing will amount to more than it would cost to scrap the pieces of cable and buy new wire equal to the total length of the pieces.

$387 Saved by One Application of Formula

An application of this formula arose recently when copper thieves took down 1900 ft. of 500,000-circ. mil cable on an outlying line after the cars had stopped running. On the following night company detectives, prowling around the vicinity, surprised the thieves digging the stolen conductor out of the sand. They had cut it into 162 short pieces varying from 4 ft. to 20 ft. in length.

There were three ways of replacing that 1900-ft. gap in the feeder line. These 162 short pieces could have been sold as scrap and 1900 ft. of new double-braid weatherproof cable bought, the pieces could have been spliced up by the wrapped cable-type splice method and the resultant shortening replaced by new cable, or it could have been spliced up by the San Francisco one-piece connector non-shortening method.

At ruling rates of 41 cents for new cable and 28 cents per pound for scrap copper the first plan would have cost $551.29 net. At $3.47 each per wrapped splice, splicing up the 162 short pieces and one 328-ft. piece of new cable would have cost $568.59. At $1.01 each per San Francisco splice and no shortening of the cable, the splicing would have cost $164.63.

The last method was followed, with a saving of $387 and $404 respectively over the first and second methods, besides a saving in time involved in making the splices and in not having to wait for delivery of new cable called for to replace shortening. If the wrapped cable splice or second method had been used it would have cost $17 more than selling the 162 pieces as scrap and buying new cable, and besides would have left the feeder full of unsightly splices.

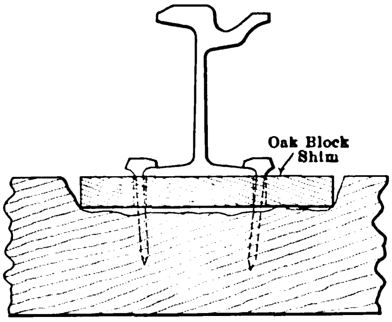
The same logic would apply to 162 short pieces of 500,000-circ. mil cable in the linemen's quarters or the storeroom, or to any number of pieces, or to any other size of conductor. If this splicing of scrap could be done by emergency crews which would otherwise be idle the cost per splice would be less and the minimum economical length of piece worth splicing would be less. Those interested will find this twenty-four-year-old San Francisco splicer fully described and illustrated in the ELECTRIC RAILWAY JOURNAL of Nov. 8, 1915, page 955.

In 1904 the San Francisco order was "Splice up 500,000-circ. mil cable from pieces as short as 10 ft. Scrap all shorter than 10 ft." In 1917 the 10 ft. was changed to 5 ft. as a minimum.

Oak Shims Used in Track Rehabilitation

That worn-out rails on a good foundation can be replaced with second-hand rails with several years' wear left in them, thus avoiding tearing out the ties, is illustrated by a job done on a section of track about a mile in length on the lines of the New York State Railways, Rochester, N. Y.

As the ties were somewhat rotted under the rail but were otherwise in good condition, the bad portion was adzed out and an oak block shim was inserted, as shown in the accompanying sketch. The blocks were made 12 in. or 15 in. long by 6 in. wide and of different thicknesses. They were bored so as not to be split by the track spikes. In doing the work it was necessary only to take out the pavement, the foundation being left in place. The paving was readily replaced, but if the ties



CROSS-SECTION SHOWING OAK SHIM

CONDITION OF TRACK AND PAVEMENT THREE YEARS AFTER RAILS WERE REPLACED BY AID OF OAK SHIMS had been torn out the cost of the work would, of course, have been much greater.

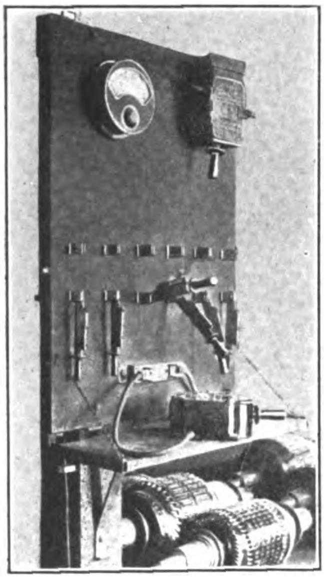
The track was replaced in this manner three years ago, and as may be seen from the accompanying illustration the track and paving are both in good shape.

Home-Made Equipment for Circuit-Breaker Testing

A Neat and Convenient Equipment for Performing a Routine Test with Speed and Precision

BY W. P. LISH
Master Mechanic Fitchburg & Leominster Street Railway, Leominster, Mass.

To facilitate the rapid testing of circuit breakers, the installation shown in the accompanying views was recently made under the writer's direction at the repair shops of this company. In brief, the apparatus consists of a group of six General Electric No. 6 type cast-grid resistors connected with six quick-break knife switches which are mounted on a panelboard of asbestos wood and wired to enable various loads to be placed on the breaker under test. The maximum capacity of the first two switches, counting from left to right, is 200 amp. each, while that of the last four is 300 amp. each. The panelboard is 4 ft. high, 3 ft. wide and 1¼ in. thick; it carries a folding shelf which is 12 in. long, 3 in. wide and 1 in. thick and on which the breaker under test is placed. Flexible No. 2 cable of the type used in motor leads connects the breaker with the supply circuit at the terminals shown in the center of the board. By closing successive switches, corresponding grids may be cut out of the circuit as indicated in the wiring diagram, giving a range of from 150 to 400 amp. The ammeter shown, a General Electric instrument reading to 400 amp., is connected into the supply circuit by the usual shunt arrangement; and a main circuit breaker permanently in service on the panel and normally set at 450 amp. protects the line.

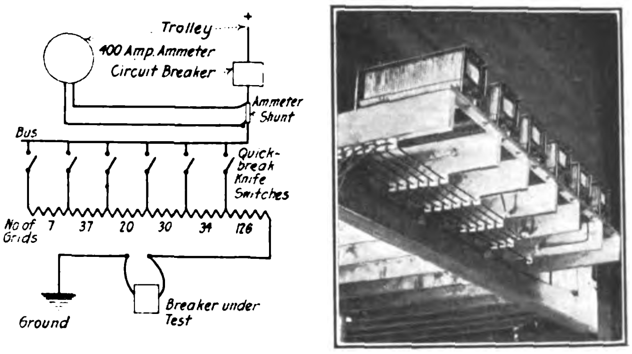


SWITCHBOARD FOR CIRCUIT-BREAKER TEST

It will be seen from the diagram that the final section of resistance always remains in the circuit, so that even if the tested breaker should be short-circuited when voltage is applied to the test wiring, the current will not exceed 400 amp. at 600 volts. The installation is within about 100 yd. of the company's power plant. In the resistance group are a total of 254 grids, the number being indicated in each unit on the drawing. The rheostat rods are much longer than in normal car service, being 31 in. in length by ⅝ in. in diameter, while the bolts are 30 in. long and ½ in. in diameter.

In testing a breaker to be used with four GE-80 or four GE-67 motors, all but the two right-hand switches will be closed. The next to the last switch is then closed, and the current becomes about 350 amp. The breaker should remain closed until the last switch in the group is closed, when the current rises to about 380 amp., depending on the line voltage. The breaker should open under this load. In other words, the breaker for the foregoing motor service should open at a load exceeding that resulting from closing the fifth switch of the group, working from left to right. For use with four Westinghouse 12A motors, a tested breaker should open when the fifth switch is closed, but should remain closed when the fourth switch is closed, the currents being about 350 and 270 amp., respectively. Circuit-breaker adjustments for opening can be made at top speed with this equipment, which, it may be said, contains no new principles, but which represents a very convenient application of well-known wiring arrangements.

One or two other points in the construction of this apparatus may be noted. The panel is supported by four horizontal iron clamps and a brace strap of 2 in. by ⅜ in. fastened to the post carrying the ceiling beams. The resistors are mounted on seven 1¾-in. x 8-in. spruce timbers bedded on a ceiling beam under a small stockroom floor as shown, the timbers being about 6 ft. long and covering a space about 10 ft. wide. Two copper clips are provided on the edges of the panel to hold the test terminals free from the shelf when not in use, the shelf also being held in position by small chains when testing is under way. The resistors are insulated from their supporting timbers, and fiber bushings are applied to the test contacts near their ends to protect the operator. By the use of extra sleeves the terminals can be quickly plugged into either size of breaker used by the company. Arcing under test, which might scar the panel, is prevented by a 2¾-in. x 8-in. x 12-in. asbestos panel shield placed between the test contacts and the breaker. Fuses can also be readily tested with this equipment.



WIRING DIAGRAM FOR CIRCUIT-BREAKER TEST; VIEW OF RESISTORS MOUNTED IN PLACE

Armature Shafts Repaired by Welding on Steel Tubing

The Elmira Water, Light & Railroad Company is using a novel method of repairing worn armature shafts on the commutator end. Steel tubing is purchased which has an outside diameter equal to that of an unworn armature shaft plus a very thin skin cut. The worn shaft is turned down so that the tubing can be put over it with a shrink fit.

To insure a tight fit between the sleeve and the shaft a circular groove is cut in the end of the shaft along the joint between the steel sleeve and the shaft. This groove is then welded full of metal and the shrink fit and the weld give the required strength.

The Union Traction Company of Indiana maintains at Anderson, near the shops, a greenhouse to accommodate the plants and flowers used at the company's park and station grounds. The greenhouse is in charge of the head gardener, and furnishes accommodation for the storage of roots during the winter.

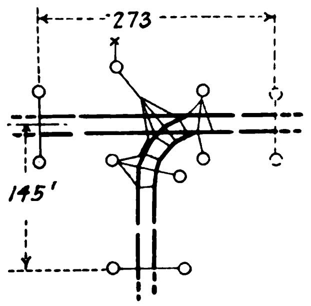
Cost of Erecting Overhead Work—XI

(From the records of a large Eastern company)

The following is the eleventh group of a series of diagrams with figures to show the actual costs of erecting the various types of overhead construction described under conditions of light, ordinary and congested traffic. The preceding groups of this series were published in the issues for Jan. 20, page 127; Jan. 27, page 173; Feb. 10, page 260; Feb. 24, page 355; March 10, page 447; March 31, page 606; April 14, page 702; May 12, page 880; May 26, page 969, and June 16, page 1105. This is the final group of the series of plates showing the costs of erecting overhead work.

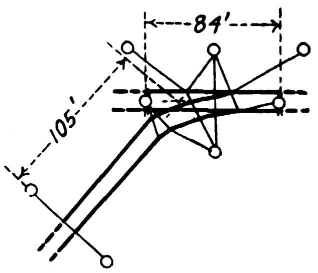
LABOR REQUIRED FOR CONSTRUCTING VARIOUS TYPES OF OVERHEAD TROLLEY SPECIAL WORK UNDER VARIOUS TRAFFIC CONDITIONS

Double track left hand branch-off, angle 90 deg.



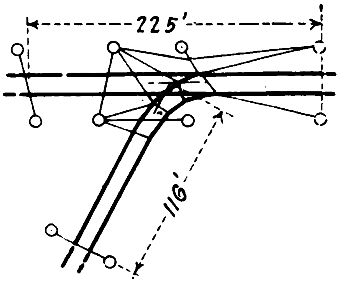
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
77*	$32.67	$23.76	$30.93	$29.04	$47.19	$34.32

Double track left hand branch-off, angle 45 deg.



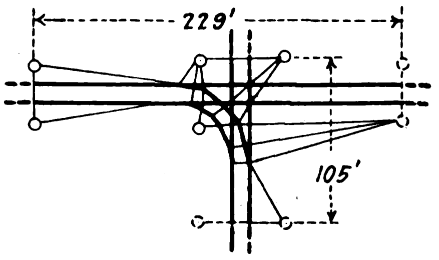
	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
78	$23.93	$9.90	$28.71	$11.88	$35.09	$14.52

Double track left hand branch-off, angle 60 deg.



	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
79*	$36.30	$26.40	$43.56	$31.68	$50.82	$36.96

Double track crossing double track with double track connecting curve angle 90 deg.



	Light		Ordinary		Congested	
No.	Labor	Trucking	Labor	Trucking	Labor	Trucking
80*	$36.30	$26.40	$45.38	$33.00	$54.45	$39.60

*Trucking includes cost of extra reel truck. None of the figures on this page includes cost of superintendence and engineering.

Costs of Installing Special Work to Begin in an Early Issue

M. Bernard, assistant engineer way and structures department Brooklyn (N. Y.) Rapid Transit System, will contribute a series of plates giving the cost of installing different types of special work. The figures have been compiled from a large number of representative jobs, and sufficient details will be given to allow track men to compare these costs with those on their own systems.

Waterproofing Rail Joints with Asphaltum

BY A. L. KALLOCH
Secretary Austin (Tex.) Street Railway

As a means of increasing the life of our track joints we are experimenting with the use of pitch as a means of sealing the joints against water. After the concrete base for the track has been poured, and before the bricks are placed, we dam up around the joints completely, except for one small opening into which hot pitch is poured. This pitch is what is known as grade "D" asphaltum (melting point, 175 deg. Fahr.), purchased from the Magnolia Petroleum Company. It is heated so that it is very thin and when poured will run into every small cavity and completely fill the space between the angle bar and the rail.

This pitch is of such consistency that in cold weather it does not become brittle, and during the excessive heat which we have in this section of the country, even though it becomes hot enough to melt and run, it cannot get out of the joint on account of the grout filler used in placing the brick. The cost per joint for labor and material, averaged over those which we have already put in, is 16 cents.

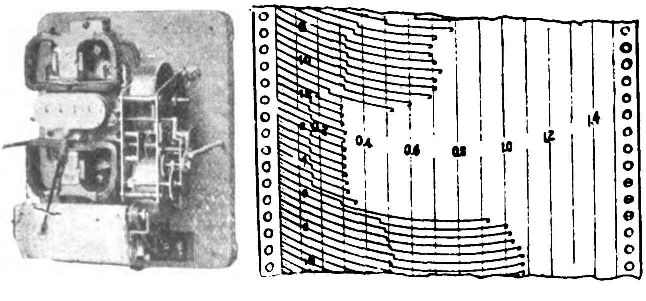
The track on which this experiment is being made is laid with 72-lb., 6-in. T-rail. International steel ties at all joints. Straight six-bolt angle bars and drive-fit bolts are used.

While we are unable at this time to give any data on the real worth of this construction since we have had it in use less than a year, yet we feel that this method will at least be effective in keeping water out of the joints.

Recording-Demand Watt-Hour Meter

In order to avoid having the commercial peak load occur simultaneously with the railway peak on railways selling large amounts of energy, it is often desirable to fix the rates according to the time of occurrence, the duration and the amount of the maximum demand. To determine these factors a meter has been developed which indicates on a four-counter dial the total kilowatt-hours consumed, and records on a paper strip the total energy used over successive predetermined time intervals. The instrument is installed as an ordinary watt-hour meter and requires no additional apparatus or wiring.

Under load the gear train of the watt-hour meter advances the counter in the regular manner. At the same time the ink-carrying pen is caused to advance across the record paper in proportion to the energy used. At the end of a predetermined time interval a stud on a reset wheel releases the pen gear from mesh with the gear train and a balancing weight returns the pen to zero, where it is again meshed with the gear train to repeat its advance during the next time interval. An operating spring controlled by the clock causes the record paper to advance 1/16 in. every fifteen minutes. Thus if the meter is arranged to record the demand at fifteen-minute intervals, the paper advances just before the pen is reset so that the pen makes a distinct and readily-observed record at the maximum point of its travel. This shows both the amount of the energy used during the interval and, by the time calibrations printed on the record paper, the time of its occurrence.

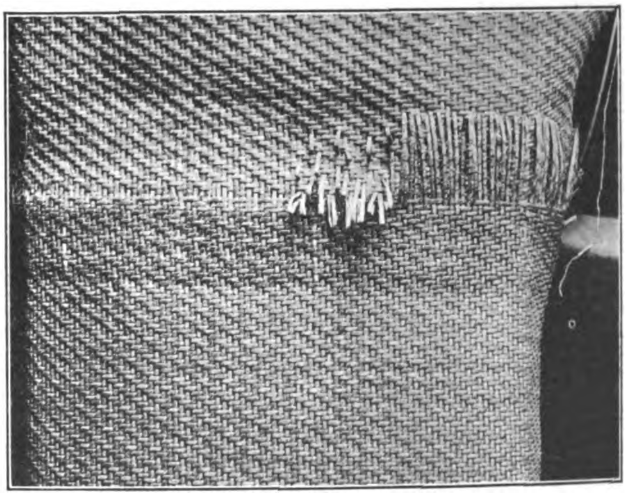


RECORDING-DEMAND WATT-HOUR METER AND SAMPLE OF RECORD MADE

The meter is the product of the Westinghouse Electric & Manufacturing Company and is known as the type RA recording-demand watt-hour meter.

Maintenance of Rattan Seating

In the shops of the Beaver Valley Traction Company, New Brighton, Pa., it is the practice to repair worn rattan seats by splicing in new strips as shown in the accompanying illustration. In this case the total cost of the job, including the labor and material necessary to splice in a 2-ft. strip of rattan, was $1.84, whereas if the 8-ft. seat had been entirely recovered with rattan at 24 cents a foot it would have cost $6.18. The only tools required in doing the work are a sack tier needle and a small pair of pliers.



METHOD OF SPLICING RATTAN SEATING, BEAVER VALLEY TRACTION COMPANY

The following formula is used as a mixture for cleaning the seats in the shops:

Aqua ammonia	2 oz.
Soft water	1 qt.
Saltpeter	1 large teaspoonful
Ivory soap, shaved	1 oz.

The soap is thoroughly dissolved in hot water and then the saltpeter and ammonia are mixed in. This is applied with the ordinary scrubbing brush, after which the seats are rinsed off in clear water.

F. R. Fox, master mechanic Toledo & Indiana Railroad, Stryker, Ohio, reports that this spring the company equipped all of its cars with water-cooler and bottle service after a successful experiment on two cars early in the year. One of the corner seats in the front end of the main compartment in each car was removed and a pedestal was constructed to support the cooler and hide the waste pipe. This pipe has a funnel-shaped opening and is located about 5 in. below the faucet. There is also a side chute in the pedestal for receiving used paper drinking cups. A wooden band, equipped with hinge and hasp, and attached to the partition, clamps the bottle a few inches below the top.

News of Electric Railways

Traffic and Transportation

Financial and Corporate **Personal Mention** **Construction News**

Plans for Rhode Island Investigation

Special Committee Created by Legislature Outlines Subjects Which Will Be Covered by It in Inquiry Into Rhode Island Company Affairs

The special committee created by the Rhode Island Legislature to examine the Rhode Island Company, which operates the electric railways in Providence and vicinity, and grant financial relief if it finds such relief justifiable, made the first formal announcement of its plans on June 23, in a statement signed by Zenas W. Bliss, chairman. The statement follows:

"In accordance with the provisions of Chapter 1516, approved April 19, of the public laws, the special commission for the investigation of the affairs of the Rhode Island Company met and organized on May 1.

"The preliminary investigations of the special commission demonstrated the necessity of a systematic and complete analysis of the physical and financial condition of the Rhode Island Company along the following general lines:

"List of companies; capitalization; physical property; distribution of property by companies and civil divisions; distribution of property by sections and fare zones; estimated cost of reproduction new and present value of all properties of the several companies; cost of operation for last five years; proportion of service to traffic; increases in cost; normal and present abnormal prices of materials, labor, coal, etc.; detailed analysis of operating expenses; taxes and other expenses in nature of taxes; comparison with other cities; analysis of depreciation and renewals; return on capital; average rate of return; analysis of leases; possible economies; estimate of cost of service for present year; traffic survey; average haul in comparison with other cities; proportions of short and long haul; movement of transfer passengers; suitability of service to traffic; allocation of cost of service to several routes.

"Experts employed by and under the direction of the commission are to begin the work along the lines as generally outlined above at once.

"The questions involved appear to the commission to be of such vital importance to the public that information in regard to the matters involved should be made available as promptly as possible. The commission will, therefore, furnish for publication the results of its investigations as soon as material is obtained in sufficient quantity and can be arranged in intelligible form. In addition to furnishing this information as promptly as possible, ample provision will be made for public hearings upon matters within the scope of the authority of the commission."

Strike in Steubenville

Trainmen on the Steubenville, Wellsburg & Weirton Railway, which connects Steubenville, Ohio, with Follansbee and other towns in West Virginia, declared a strike on June 25 to enforce their demands for an increase in wages to 40 cents an hour. The company had offered the men 34 cents an hour. Apparently both sides have settled down for a period of waiting. Up to June 26 the company had made no endeavor to move its cars.

The business men of Steubenville and vicinity, through the Steubenville Chamber of Commerce, have asked the strikers to have their representatives meet with them in an endeavor to ascertain what they really want and what they will accept in settlement of their differences with the company. Mill men and others, who have depended entirely on this road for transportation, are experiencing great difficulty in getting to and from their work.

Southern Pacific Fuel Problems

Fuel Oil Shortage Severe—Electrification Suggested to Relieve Congestion on the Tehachapi Pass

At a hearing before the Railroad Commission of California early in the week ended June 30 W. R. Scott, general manager of the Southern Pacific Railroad, stated the fuel oil shortage was such that unless there was speedy relief train service must be curtailed. Considering all oil storage and sources of relief now apparent, ninety days was the maximum period for which operation on the present basis was possible. At present the company consumed 44,000 barrels of oil a week. Of this amount 18,000 barrels were being purchased in the open market. The converting of divisions to coal consumption had been considered, but the idea was abandoned as unwarranted when the visible supply of coal was taken into account.

Another very serious problem was the freight congestion over the mountain divisions, particularly the Tehachapi Pass where a single-track line must accommodate two transcontinental systems. The congestion was due partially to increased business and partially to absence of bottoms for transcontinental shipments via the canal route. Under these conditions speedy electrification had been suggested. The cost of electrification was believed to be less than double-tracking, which could be postponed by the increased capacity due to electrification. If the railroad could adapt its requirements so as to use standard electrical equipment it was believed that as an emergency measure manufacturers could supply the locomotives and at least the most critical mountain pass could be operated as an electrified division within ten months. If this was found feasible it would at the same time relieve the freight congestion and release the oil now inefficiently used in steam locomotives for purposes where hydroelectric energy is not suitable.

Toledo Mayor Seeks Valuation

Appropriation of $25,000 Asked to Value the Property of the Toledo Railways & Light Company

In presenting his expense budget to the City Council recently Mayor Milroy of Toledo, Ohio, asked for an appropriation of $25,000 to be used in making a valuation of the street railway property of the Toledo Railways & Light Company. He said that the street railway problem would never be solved until the fair value of the property was known. This must be ascertained in case the city decided to buy the property, and was necessary to fix a just and reasonable fare. In continuing, the Mayor said:

"It has long been settled by the courts that a public service corporation may charge only such rates as will permit a reasonable profit, say 6 per cent, the legal rate of interest on the money actually invested. According to the company's own report it made a profit of $510,000 on its street railway last year after paying all expenses and taxes. This amount is 6 per cent on $8,500,000. Will anybody assert that the street railway is worth that much? Yet, here we are paying a rate of fare that would be just only if there was an actual investment of $8,500,000. The company pockets the amount and suggests that it may be compelled to raise the fare again."

The Mayor went on with the statement that the company was able to make such a profit because the true value of the property was not known to the public, and that only by employing its own engineers and experts would the city be able to arrive at such a valuation.

New Wage Scales in Chicago

Surface Lines and Elevated Railways Make New Wage Agreements—Scale Increased Three Cents an Hour—New Contract Period Is Three Years

The Chicago Surface Lines and the Chicago Elevated Railways, through their presidents and after conferences with officials of the Amalgamated Association of Street & Electric Railway Employees, have agreed upon three-year working contracts for the men with a horizontal increase of 3 cents an hour. The agreement between the Surface Lines and the men includes the renewal of all the conditions of the 1915 contract, except the wage scale.

DETAILS OF THE NEW SURFACE RAILWAY WAGE SCALE

The old and the new scales for the surface railway men follow:

	Old Wage Per Hour	New Wage Per Hour
First three months	27 cents	30 cents
Second three months	29 cents	32 cents
Second six months	30 cents	33 cents
Second year	32 cents	35 cents
Third year	33 cents	36 cents
Fourth year	34 cents	37 cents
After fourth year	36 cents	39 cents

An increase from $3 to $3.25 is provided for night car runs. Car repairers, car placers and cleaners, and other shop and operating employees, members of the union, also receive increases on the 3-cent basis whether paid by the day, week or month. According to Leonard A. Busby, president of the Chicago Surface Lines, the new agreement carries with it a wage increase of about $1,500,000 a year. Mr. Busby has stated that this increase is not warranted by the financial condition of the company, and in fact no increase is warranted at the present time, but on the other hand the management felt that it was its duty to meet the issue of increased cost of living and to go as far as reasonably possible in helping the men. He said the only way in which the company would be able to carry this heavy burden would be through the loyal co-operation of its employees.

On June 26 the union members ratified the Surface Lines contract by a vote of about three to one in favor of the agreement. Some of the younger members of the organization created considerable opposition on the plea that the union would be bound for three years. All previous contracts have been for two years.

RATES OF WAGES ON CHICAGO ELEVATED RAILWAYS

The men on the Chicago Elevated Railways voted on their contract on June 27. The wage scales, new and old, for the elevated railway employees follow:

	New Rate Per Hour	Old Rate Per Hour
Regular motormen	41 cents	38 cents
Extra motormen:		
First year	35 cents	32 cents
Second year	36 cents	33 cents
Third year	37 cents	34 cents
Fourth year	39 cents	36 cents
Conductors	34 cents	31 cents
Regular guards	31 cents	28 cents
Extra guards:		
First year	28 cents	25 cents
Second year	29 cents	26 cents
Third year	30 cents	27 cents
Fourth year and over	31 cents	28 cents
Switchmen:		
First year	35 cents	32 cents
Second year	37 cents	34 cents
Third year	38 cents	35 cents
Fourth year	40 cents	37 cents
Fifth year and over	41 cents	38 cents

Flagmen:	New Rate Per Month	Old Rate Per Month
First year	$53.30	$42.50
Second year	56.80	46.00
Third year and over	62.80	52.00

Women ticket agents:	New Rate Per Day	Old Rate Per Day
Regular	$2.35	$2.05
Extra, first year	1.95	1.65
Extra, second year	2.05	1.75
Extra after second year	2.15	1.85

W. D. Mahon, president of the Amalgamated Association, urged the men to accept the agreements. He said that they provided for the largest single increase in wages members of the association had ever received. The men might not profit near so well under arbitration, he pointed out.

Work on St. Louis Compromise

Program Laid Down for Conferences Looking Forward to Settlement of Matters at Issue Between City and United Railways

At a conference in the office of Mayor Kiel of St. Louis, Mo., on June 20, City Counselor Daues and Thomas M. Pierce, special counsel for the United Railways, were instructed by the joint committee to prepare a skeleton plan of compromise with the city within two weeks as a basis for negotiation by the committee. Mayor Kiel presented an outline of the city's program, which is: Full payment of the mill tax to date, $2,135,466; a partnership with the city, in which profits would be divided, scaling down of the United Railways capitalization and recognition of franchise rights for a substantial period in the future.

PRESIDENT MCCULLOCH'S SUGGESTIONS

Richard McCulloch, president of the United Railways, said that the company was willing to enter into a partnership or any other arrangement suggested, provided the city would make it possible to induce investors to advance money needed for improvements. Mr. McCulloch urged speedy action by the conferees, but Mr. Daues said it would not be possible to submit a report within a week, and the time was extended to two weeks. The city officials were also assured that the company was prepared to let the city in as a "full partner" in the traction business, provided a compromise of franchise and mill tax litigation could be arranged that would enable the company to borrow the money required for extensions and improvements in the next few years.

The committee representing the city is Mayor Kiel, Comptroller Nolte and Aldermen Tamme, Bergt and Schrantz. The committee representing the company is Mr. McCulloch, Murray Carleton, A. L. Shapleigh, A. J. Siegel and Thomas M. Pierce, counsel for the company.

It was reported unofficially that City Counselor Daues and C. E. Smith, consulting engineer of the Department of Public Utilities, had been quick to agree upon the general outlines of the city's counter proposal. These were stated in brief as follows:

CITY'S COUNTER PROPOSAL

"Valuation of the company's properties and contraction of its present capitalization, with a limitation of earnings to 6 per cent after deductions for depreciation, operating expenses and other charges.

"Provision for sharing the net surplus in the ratio of 60 per cent for the city and 40 per cent for the company.

"Creation of a sinking fund (as one of the fixed charges) for a gradual reduction of the capitalization below the amount to be fixed in the first agreement, so as to afford the city the right and opportunity to purchase the property at a decreasing cost.

"Reservation of the city's option of using its share of the net surplus either for public purposes or for reinvestment in improvements or extensions of the company's present system, or in the building of either subways or elevated lines or both.

"Participation by the city in the management of the company by the election of several—probably four—municipal officials as directors of the company and the appointment of another to act with the president of the corporation and supervise expenditures, including those for wages, salaries and purchases of supplies, and for improvements, betterments and extensions."

This much having been accomplished it was then stated that a meeting of the joint conference representing the company and the city would be called by Mayor Kiel for Tuesday, June 26, if by that time Counselor Daues and Engineer Smith had completed their tentative draft of the city's proposals. The Mayor desired to have the plan submitted to officials of the United Railways before he left for New York on June 27, to be absent for five or six days.

Representatives of the city and officers of the company conferred again on June 26 and after various sections of the so-called "skeleton plan" had been discussed the matter was put over until July 6. This conference resulted in making public the full "skeleton plan."

British Columbia Strike Settled

Settlement Results from an Agreement Between the City and the Company to Arbitrate Problems Before Them

The strike of the employees of the British Columbia Electric Railway, Vancouver, B. C., ended on June 22. The men were granted all demands, including the increase of 5 cents an hour. The settlement resulted from an agreement between the company and the municipal authorities to arbitrate jointly the problems before them under a commission appointed by the provincial government. Both sides are to abide by the findings of this commission. A feature of the agreement was that the company had to resume service at once and continue it. When the employees refused to compromise on the matter of wages the company agreed to their demands. It has not been settled whether the increase in wages is to be permanent or only for the duration of the war. The new wage scale is 27 cents for the first six months; 35 cents for the next eighteen months; 36 cents after two years; 38 cents after three years and 40 cents after four years. The former scale was 27 cents for the first year; 29 cents for second year; 31 cents for the third year; 33 cents for the fourth year and 35 cents for the fifth year. The interurban employees get the same rate of increase.

REVIEW OF STRIKE

The strike on the British Columbia Electric Railway in Vancouver and New Westminster was declared on June 13, after a demand for higher wages had been refused by the company. About 800 men went out. They were joined on June 14 by 300 employees of the same company at Victoria. The men who ceased work included motormen and conductors, car repairers, machinists, blacksmith's helpers, and others who were members of the Amalgamated Association. As a result the street car lines in Vancouver and suburbs, North Vancouver, New Westminster and Victoria ceased operation and the interurban lines owned by the same company, known as the Central Park line and Burnaby Lake line, between Vancouver and New Westminster, and the Saanich line at Victoria, also suspended operations.

WHAT THE MEN DEMANDED

The men were under an agreement dated Sept. 15, 1916, whch was to run until June 30, 1918, or at the expiration and six months after the cessation of the war, whichever date came first. The wage scale for city and suburban motormen and conductors, car repairers, armature winders' helpers, blacksmiths' helpers, machinists' helpers and sawyers, as noted previously, was: First year, 27 cents; second year, 29 cents; third year, 31 cents; fourth year, 33 cents; after fourth year, 35 cents. The motormen and conductors on the interurban lines were to receive 1½ cents an hour in addition to these rates. Owing to the increase in the cost of living, the men demanded increases to the following scale: Motormen and conductors on city lines, car repairers, etc., first six months, 27 cents; next eighteen months, 35 cents; third year, 36 cents; fourth year, 38 cents; fifth year, 40 cents. On the interurban lines the same increase of 1½ cents an hour above these rates was demanded. For track men 27 cents an hour was demanded for the first six months, and after that 35 cents an hour. The men, in all departments, requested a minimum wage of 35 cents an hour after six months' service. All men on a monthly salary were to receive an increase of $10 a month.

COMPANY'S COUNTER OFFER

The company's counter offer was of a series of war bonuses. Under its offer men paid up to $60 a month were to receive 15 per cent additional; men paid more than $60, but not more than $70 a month, 10 per cent; more than $70 and not more than $80, 5 per cent. The men voted to strike when the company refused to meet their demands and as a consequence no cars were operated in Vancouver, North Vancouver, New Westminster and on the Central Park and Burnaby Lake lines on June 13.

The company contended that the offer it made of war bonuses was adequate to meet the increase in the cost of living according to figures in the *Labor Gazette*, the dominion government's official publication. Although the cost of living was 18 per cent higher in Winnipeg than in Vancouver, the rate of wages offered the men was said to be higher in Vancouver. The company also pointed out that the men had received increases amounting to $120,000 a year in the fall of 1916 in spite of the existence of an unexpired agreement. The company contended that the proposed war bonuses were sufficient to meet any increase that had taken place since then.

The men said that the increases granted by the company last fall were only sufficient to bring wages to the level of what they should have been before the war and that since then an increase in the cost of living has occurred which warranted the payment of the further increases demanded.

COMPANY'S GRIEVANCE AGAINST CITY

A parallel contention by the company was that owing to jitney competition and the fixed nature of its fare, it was unable to operate under present conditions and grant the wage increases demanded by the men. On the Vancouver city system the fare is 4 1/6 cents with transfer privileges, while in North Vancouver and New Westminster, which are separate systems, there is a straight 5-cent fare.

Since December, 1914, the company's revenue has been seriously depleted by jitney competition, which has been more or less unregulated by the city. Jitney by-laws have been passed by the city of Vancouver, but the enforcement of them has been lax and when the strike occurred about 150 jitneys were operating in competition with the paying city lines, the non-paying business to the suburbs being left entirely to the street railway. In addition to the decrease in revenue caused by the jitney the company suffered through the increase in the cost of operation. It had also been affected by the increase in taxation both under the provincial government and under the local governments of the districts and cities in which it operates. The company has $48,000,000 invested in British Columbia and the increase in taxation to provincial and local governments was expected to be $50,000 this year.

INTERURBAN SERVICE STOPPED

Passenger service on the Lulu Island interurban lines of the company was stopped on June 17 when, in accordance with the request of the Electrical Workers' Union, the company was compelled to cease the employment of the three foremen on the maintenance of its rolling stock used on these lines. The electrical workers contended that this was a breach of the arrangement under which they promised not to take part in the strike and rather than jeopardize the light and power service on the mainland, the company decided to cease the employment of these foremen on maintenance work. In the interest of safety the operation of all cars on these lines was suspended. On June 18 the Fraser Valley division was being operated, but with only one car to a train instead of three.

The company set its case frankly before the public in paid daily newspaper advertisements.

Frontier Case Closed

Testimony on the application of the New York Central Railroad and the Erie Railroad for the revocation of the certificate of the Frontier Electric Railway was concluded before the Public Service Commission at Albany. Chairman Van Santvoord stated before the hearing closed that only in its last stages had the commission been frankly informed of the plans of the Pennsylvania Railroad and the Delaware, Lackawanna & Western Railroad with regard to the Frontier line. It was brought out at the hearing on June 18 that the contract for the purchase of the road's stock by the two trunk lines was to some extent contingent upon the approval of the commission for the construction of the proposed line at grade.

The testimony was concluded by statements from railroad operating officials aimed to show that even should the line be built it would grant no great relief to the Pennsylvania and the Delaware, Lackawanna & Western from the congested conditions of connections with Canada at Black Rock from which they say they now suffer.

The companies have two weeks in which to file and answer briefs.

Meaning of Loss of Chicago Bills

Legislature Failed to Sense Popular Demand for Measures Based on Report of Chicago Traction and Subway Commission

The four Chicago traction bills have failed of passage in the Legislature. As stated in the ELECTRIC RAILWAY JOURNAL for June 23, these bills were intended to supply the enabling legislation for Chicago's extensive traction plan. The measures had passed the Senate with generous majorities and were reported to the House committee on public utilities and went to the third reading. The committee then adjourned without a record vote on any of the bills.

The bills before the Legislature grew out of the presentation of the report of the Chicago Traction & Subway Commission early in December, 1916. While considerable delay was brought about in the consideration of these bills by the Council, they were finally drafted and embodied the principal legislation needed to put through the program of the commission. The so-called "home-rule" bill was modeled after the State utilities act and would have transferred to the City Council the control over service and rates now held by the utilities commission. An editorial on the loss of the home rule bill appears elsewhere in this issue.

There was also a bill providing for the merger of the elevated and surface lines in Chicago. The Traction & Subway Commission report recommended the adoption of an indeterminate franchise, but this was attacked principally on the ground that it was virtually a perpetual franchise. The commissioners and the railway officials thought the fifty-year franchise was necessary in order to carry out the construction program. Finally, on May 9, a straight thirty-year franchise bill was approved by the Council and sent to the State Legislature. The fourth bill was designed to remove the doubt expressed by counsel as to the right of the city to construct and own subways. This measure was also approved by the City Council on May 9.

WHAT THE LOSS OF THE BILLS MEANS

All the bills recommended to the Legislature in connection with the traction program contemplated that no ordinance in connection with them should go into effect until after a referendum vote at some regular or special election. The complete loss of the legislative program for Chicago in the Legislature provoked a great deal of discussion. An expression of opinion on the loss of the bills by a man interested in the measures follows:

"The death of the four bills is most disappointing to the people of Chicago, the Chicago local transportation committee and to part of the traction interests at least. Just what the attitude of the other traction interests was is not definitely known, except that such evidence as was manifest indicated opposition. The Assembly seemed less concerned with the Chicago bills than with any other matters before it and did not quite grasp the idea of the city instead of the traction companies asking for something. It was disinclined to study the bills which Walter L. Fisher and Henry D. Capitain presented purely on their merit, and preferred instead to assume that something was being put over and to refrain from giving any thought or attention to them.

"Practically no discussion of the bills themselves was heard. Those of the opposition who talked simply orated on the awful ordinances that were going to be passed in Chicago on the strength of these bills. Other influence against the bills was plainly in evidence, but its nature could not be deciphered by the Chicago representatives. The Senate had previously considered the bills carefully, and was satisfied that there was little substance in the arguments which the opponents of the measures summoned to their aid. It passed the bills by decisive majorities.

"The issue is now dead, at least as far as any comprehensive plan is concerned, for two years, when the Legislature meets in its next regular session. The companies might still come to some temporary operating agreement looking toward an improvement in conditions, but this is quite improbable, and not much could be gained. The complete plan of the Chicago Traction & Subway Commission was needed, and the failure of the State Assembly to put through the program may be placed to its discredit as an instance of gross evasion of a popular need."

Bonus Payment at Athens

Unusual Conditions Prompt Athens Railway & Electric Company to Start Bonus System—Problems Before the Company Reviewed

On June 2 the Athens Railway & Electric Company, Athens, Ga., handed to each of its employees a bonus check, the first of a series which will supplement the last pay check each month until further notice. The bonus check amounts to about 10 per cent of the monthly payroll. To each employee was also handed at the time of the payment of the wages on June 2 a letter from C. D. Flanigen, president and general manager of the company, setting forth the reasons for the payment and reviewing the conditions that confront the company. Among the exacting requirements which it is called upon to meet are paving charges, demands for free service, accidents not due to carelessness on the part of the company and other obligations that are based largely upon public opinion rather than justice. All these pile up the cost to the company. More recently there has come along the unprecedented increase in the cost to the company of practically all material consumed by it in its regular operations. Mr. Flanigen concluded his letter as follows:

LETTER FROM THE PRESIDENT TO HIS EMPLOYEES

"Unable to ask the public more than 5 cents for a ride, or more than the old scale for electric light and power until they realize in the light of the present-day conditions the inequity of some of the burdens upon us, it has seemed out of the question to increase our payroll, but we realize that for you the situation has become so acute that some relief is necessary and we have determined in the uncertainties of the present and the absolute blank as to the future to issue to each man at the end of each month, for the present at least, a bonus check to supplement his regular pay, and so help him to meet the increased demands made upon him.

"Your bonus, if you have made a full month, will be $........ with a proportionate amount for part time, and we trust this addition to your pay check will enable you to meet all your obligations, and that we may be able to continue it so long as it is needed.

"As manager of the company and your fellow co-worker, I wish to avail myself of this opportunity to express to you my appreciation of your co-operation in enabling us to sell a first-class brand of service. Service is our merchandise and we should not be satisfied with anything less than the best for our customers. We have been pulling together and the New York office appreciates the results we have got in face of the adverse and unusual conditions that have hampered us. Our success in inaugurating economies undreamed of before without detriment to the service shows that nothing is impossible where there is efficient team work and earnest co-operation, and for this I wish to thank you."

EMPLOYEES EXPRESS THEIR APPRECIATION

On June 4 Mr. Flanigen received the following letter of appreciation from a committee of the employees:

"We, the undersigned, employees of the Athens Railway & Electric Company, take this method of thanking you for the raise, or 'bonus' attached to our salary check of June 1. We assure you that it was appreciated by all. In return we wish to pledge our efforts and co-operation in maintaining the good record made by this organization. We also wish to pledge to the company, and the public it serves, the very best service our ability affords. We thank you."

Springfield Strike Settled

The strike of the employees of the Springfield (Mo.) Traction Company has been terminated by mutual agreement on an open shop basis, the men have returned to work and good feeling and harmony prevail. An agreement has been entered into whereby in case of dispute and failure to agree between the company and the employees, the matter is to be referred to a board of arbitration. This board is to be composed of one member representing the company, one representing the employees and a third member selected from the Public Service Commission of Missouri. The strike has been in progress since October, 1916.

Massachusetts Special Commission

Members of the Body That Will Inquire Into Massachusetts Street Railways Named

W. Cameron Forbes, former Governor General of the Philippines, and former State Senator Gurdon W. Gordon of Springfield, have been appointed by Governor McCall of Massachusetts to be members of the special commission to study the problems of the street railways of the State. The other members of the commission were appointed from the Senate and the House of Representatives by Speaker Cox and President Wells. They are Senators Martin, North Attleboro; Eldridge, Somerville, and Harrop, Worcester, and Representatives Gibbs, Waltham; Worrall, Attleboro; Bunting, Methuen; Hays, Boston; Donovan, Boston, and Fitzgerald, Northampton. Senator Gordon was a former chairman of the legislative committee on street railways.

Violence in Dayton Strike

Although conductors and motormen of the Dayton (Ohio) Street Railway stated that there would be no violence during the strike, disorder has resulted. The company has kept its cars moving fairly well with men of the city employed by the company when its own men stopped work.

On June 25 three cars were attacked by a crowd and all the windows which had not been lowered because of the warm weather were broken. None of the passengers riding on the cars was injured.

A squad of police called to the scene undertook to guard one of the cars until it was run out of the vicinity, but the mob forced itself between the car and the automobile containing the officers and while in sight of them stoned the car and finished the windows that had not already been broken. No arrests were made on this occasion, as the officers were unable to identify those who actually participated.

Cleveland Subway Discussed

Underground Line from Superior-Detroit Bridge to Public Square Advocated as Start of a General Subway System

The City Council of Cleveland, Ohio, met as a committee of the whole on June 21 to consider public improvements. One of the matters taken up was the proposition of Mayor Harry L. Davis to build a subway under Superior Avenue between the new Superior-Detroit bridge and the Public Square, with terminals for all lines under the Square. Apparently the idea of a subway was favored by all, but there was a division as to the manner in which it should be done. Mayor Davis believes that it should be put into the hands of a special commission, and Director of Finance Neal said that this plan would make it possible to finance the construction by an issue of bonds outside of the ordinary statutory limitations.

The operation of the subway was also discussed. J. J. Stanley, president of the Cleveland Railway, had informed members of the Council that if a rental plan was arranged the rate of fare would have to be higher. Others thought that the saving and convenience to the company would offset the rental expense. Mr. Neal said the annual charge on a bond issue for this purpose would be $203,000, and he felt that much of this could be provided by rental.

Mayor Davis has since taken the stand that a subway and an underground terminal would be of as much benefit to automobilists, pedestrians and people using teams as to the railroad and its patrons. He therefore argued that the cost should be taken care of from a general tax, so that all may contribute to it. He said that it would be manifestly unfair for the patrons of the railway to bear the whole burden, as would be the case under a rental plan.

It is the idea of Mayor Davis that this short section of subway, with the underground terminal, would merely be the first unit of a subway system which would eventually reach all other lines and result in removing street cars from the surface in the congested section of the city. The city planning commission has recommended that the proposed subway be built, but made no suggestion as to how it should be financed or operated.

Strike Threat in Seattle

Recently Formed Union Presents Demands for Wage Increase and Shorter Day

The Seattle division of the Puget Sound Traction, Light & Power Company was threatened on June 26 with a strike of the men on the railway lines. The trainmen have organized a union affiliated with the Amalgamated Association and are aided by the Rainier Valley Railway organization of Seattle. They have demanded a large wage increase and an eight-hour day. The company has refused these demands, but has consented to the trainmen's request for arbitration. A board of three has accordingly been appointed for arbitration and conferences will be held shortly. The traction company expects no action by the men prior to the arbitration meetings.

The strike is threatened in the face of the fact that the company two days previous to the presentation of the demands by the men announced that on July 1 the Seattle men would receive a raise in wages of 2 cents an hour. A bulletin noting the increase was posted on June 21 by A. L. Kempster, manager of the company. The company also announced that the period of employment required to reach the maximum wage for that class of employment had been reduced to six years. Approximately 1500 men were to benefit by the order.

Up to three years ago the company's rules required employment for a period of fifteen years before trainmen could reach the wage maximum. Not long ago this was reduced to ten years, and on June 21 it was reduced to six years. This is the third increase in wages since the first of the year. The first was made on Jan. 1, another announced originally for July 1 was made effective on May 1, and the third was proposed for July 1. The first two raises were 1 cent an hour each, and the third 2 cents an hour. These increases add a little more than $140,000 to the annual payroll of the company.

Third East St. Louis Arbitrator Chosen.—Frank J. Keating, former city treasurer of East St. Louis, Ill., has been agreed upon as the third member of the arbitration board to decide the matter of wages to be paid employees of the East St. Louis & Suburban Railway. Al. Towers, Belleville, represents the employees, and Charles E. Smith, St. Louis, represents the company. The third arbitrator was selected after it became apparent that there was very little likelihood of Messrs. Towers and Smith being able to reach an agreement.

Fight in Council Over Extension.—The Council of Detroit, Mich., has rejected a report by the public utilities committee directing the corporation counsel to take legal action against the Detroit United Railway if it did not immediately begin work to complete the Grand Belt line. The vote of rejection was twenty-one to twelve. It was followed by the resignation from the committee of Alderman Vernor, chairman of the committee, who contended that the company was obligated to build the line. On the other hand, Alderman Littlefield said that in the four years since the contract was entered into conditions had changed greatly and that the route of the line should be abandoned and an alternate one chosen.

River Tunnel Headings Holed Through.—Oscar S. Straus, chairman of the Public Service Commission for the First District of New York, on June 21 "fired the blast" which connected the south headings of the new Whitehall-Montague Street tunnel underneath the East River. The headings "holed through" on the occasion in question, were the last of the two new downtown rapid transit tunnels being constructed under the dual system of rapid transit contracts. Two other subway tunnels, however, are being constructed further up the East River, one at Fourteenth Street and one at Sixtieth Street. The Whitehall-Montague Street tunnel will form the under-river connection between the Broadway subway in Manhattan and the Fourth Avenue subway in Brooklyn.

Kentucky Assessments Increased.—Assessments of practically all the Kentucky utility corporations have been increased by the Kentucky Board of Valuation and Assessment. The new tax law will go into effect this fall and the assessments are announced for this year. They are subject to revision after representatives of the companies are heard. Among the assessments announced are the following: Louisville & Southern Indiana Traction Company, $82,783, increased from $57,330; Louisville & Northern Railway & Lighting Company, $53,156; Louisville & Interurban Railway, $2,142,956, increased from $2,115,000; Kentucky Traction & Terminal Company, $1,500,000 increased from $1-200,000; Ohio Valley Electric Railway, Huntington, W. Va., $722,913, increased from $496,681.

Protest Against Paving Unavailing.—In face of a vigorous protest from F. I. Fuller, vice-president of the Portland Railway, Light & Power Company, the City Council of Portland, Ore., recently passed an ordinance providing for the improvement of the East Fiftieth Street from Division Street to Powell Valley Road by paving. In his statement to the Council Mr. Fuller said that his company did not have any franchise from the city for its railway tracks on the street, that it would be unable to bond the cost of its share of the improvement against its franchise, and would have to pay cash. The company was not financially able to meet the expense at this time. He also admitted that employees of the company, because the company had granted them a recent increase in wages, had volunteered to circulate a remonstrance against the improvement in order to save the expense. He asked the Council to take no action until it had investigated the proposal fully. The company's share of the cost of the proposed work will be approximately $41,000. The ordinance was passed by the Council, however, without a dissenting vote.

New York Central Improvement Committee Organized.—Henry W. Hodge of the Public Service Commission for the First District of New York has been elected chairman of the joint conference committee of the Board of Estimate & Apportionment and the Public Service Commission for the First District, named under the Ottinger-Ellenbogen act passed by the last Legislature for the purpose of finding a solution of the New York Central Railroad west side track problems. The other members of the joint conference committee are Public Service Commissioner Charles S. Hervey, Borough Presidents Maurice E. Connolly of Queens; Marcus M. Marks of Manhattan; and Calvin D. Van Name of Richmond. The last three represent the Board of Estimate & Apportionment. The committee has already had one conference with Ira A. Place, vice-president of the New York Central Railroad. Other meetings of the joint conference committee will be held in the near future. One of the questions before the joint conference committee is the removal of the tracks of the railroad from the surface on the west side of the city and their electrification.

Kentucky Passes Void.—Passes issued by common carriers as part of the consideration of a contract prior to the enactment of the Kentucky anti-pass law are void, according to a decision of the Kentucky Court of Appeals handed down on June 22. There were two cases before the court, each seeking mandatory injunction to compel the Kentucky Traction & Terminal Company, Lexington, to continue issuing transportation to plaintiffs and their families. James A. Murray gave a right-of-way through his property to the Capital Railway, predecessor of the Kentucky Traction & Terminal Company, and part of the consideration was perpetual passes for himself and family. The contract was entered into after the adoption of the present State Constitution, which contains a provision prohibiting unfair discrimination in transportation rates and directs the Legislature to enact laws to carry the provision into effect. When the new law became effective the railway canceled the passes, along with numerous others. Murray and others filed suit contending that their passes were given for valuable consideration and that the law, if it affected them, impaired the obligation of a contract and was in contravention of the Constitution. The Court of Appeals, however, said that the contract was entered into in full knowledge of the fact that the Constitution gave the State police powers to prohibit granting of passes, and the anti-pass law prohibited them except in exchange for advertising. The court added: "Whether appellees have a remedy for loss that may result to them from the abrogation of their contracts with the appellant is not now decided."

Financial and Corporate

Annual Reports

United Light & Railways Company

The income statement of the United Light & Railways Company, Grand Rapids, Mich., for the year ended Dec. 31, 1916, follows:

SUBSIDIARY COMPANIES		
*Gross earnings (including $914,644 for inter-company business)		$6,885,779
*Operating expenses and taxes (including $914,644 for inter-company charges)		4,219,386
Net earnings		$2,666,393
Interest and dividends on subsidiary bonds, preferred stocks and notes:		
To United Light & Railways Company	$477,642	
To the public	912,871	1,390,513
Net earnings on stocks—subsidiary companies		$1,275,880
Net earnings due others than United Light & Railways Company		18,389
UNITED LIGHT & RAILWAYS COMPANY		
Earnings available on stocks owned		$1,257,490
Dividends and interest receivable		489,428
Miscellaneous earnings		171,903
Gross earnings		$1,918,821
Expenses	$125,446	
Taxes, general and federal	21,462	146,908
Net earnings		$1,771,913
Interest on first and refunding 5 per cent bonds		403,724
Balance		$1,368,189
Interest on ten year 6 per cent convertible gold debentures	$7,262	
Interest on three and five year notes	135,000	
Interest on commercial loans	32,654	174,916
Balance available for dividends		$1,193,273
Dividends on first preferred stock—6 per cent		595,792
Surplus earnings		$597,480

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*This amount of $914,644 represents inter-company transactions, of which $288,185 is for electric power sold to subsidiary railway companies.

From the surplus, $298,353 was credited to the depreciation reserve (of which the United Light & Railways Company's proportion pro rated on its stock holdings of subsidiary companies is $292,859). In addition the subsidiary companies expended or set aside for maintenance an additional sum of $432,112, which was charged directly to operating expenses—making the total expended or set aside for maintenance and depreciation of property $730,466, or more than 12.75 per cent of the gross earnings received from the sale of gas, electricity, heat and transportation.

The operating expenses of subsidiary companies included $295,431 accrued for payment of general and federal taxes, an increase of $34,057 for the fiscal year, and also substantial increases in wages paid to all classes of employees.

The gross business of the company in all departments showed a substantial increase, but owing to the increased cost of materials and wages involved in operation, increased general and federal taxes, and to material reductions made in gas and electric rates, the net earnings, while satisfactory, did not show such a large proportionate increase. The revenue passengers of all classes carried on the railways were 38,013,075, an increase of 4,484,082 or 13.37 per cent. Below is a comparative statement indicating the sources of revenue both gross and net, and the percentage each class of service bore to the total:

Gross Earnings:	1916	Per Cent of Total	1915	Per Cent of Total
Gas	$1,353,805	19.66	$1,318,922	20.91
Residuals	92,709	1.35	122,934	1.95
Electric	2,587,459	37.58	2,322,983	36.82
Railway—City lines	1,806,218	26.23	1,599,459	25.35
Railway—Interurban	868,601	12.61	791,361	12.55
Heat	86,215	1.25	81,004	1.28
Miscellaneous	90,770	1.32	72,109	1.14
Total	$6,885,779	100.00	$6,308,776	100.00
Net earnings:				
Gas	$564,160	21.16	$611,353	24.64
Electric	1,152,546	43.22	1,101,701	44.40
Railway—City lines	571,968	21.45	439,867	17.73
Railway—Interurban	300,693	11.28	254,143	10.24
Heat	10,745	.40	19,732	.79
Miscellaneous	66,280	2.49	54,714	2.20
Total	$2,666,393	100.00	$2,481,514	100.00

During 1916 $1,474,274 was expended for additions to properties and extensions of service. Of this total $271,078 was for gas properties, $537,474 for electric properties, $619,333 for railway properties and $46,387 for heating properties. Expenditures made for construction were largely in the nature of natural extensions of gas, electric and railway service, due to the growth of the communities served—in some cases to complete work started in the year 1915.

Omaha & Council Bluffs Street Railway

The comparative statement of income, profit and loss of the Omaha & Council Bluffs Street Railway, Omaha, Neb., for the calendar years 1915 and 1916 follows:

	1916		1915	
	Amount	Per Cent	Amount	Per Cent
Revenue from transportation...	$3,069,324	94.35	$2,839,180	94.76
Revenue from other operations.	184,003	5.65	156,898	5.24
Gross operating revenues....	$3,253,327	100.00	$2,996,079	100.00
Operating expenses	1,833,146	56.35	1,656,643	55.29
Net operating revenue.......	$1,420,180	43.65	$1,339,435	44.71
Taxes assigned to railway operations	288,679	8.85	....	....
Operating income	$1,131,501	34.80	....	....
Miscellaneous income	14,839	0.45	12,919	0.43
Gross income	$1,146,340	35.25	$1,352,355	....
Deductions from income*......	636,204	19.56	872,010	....
Net income	$510,136	15.69	$480,344	16.04
Dividends	400,000	12.30	412,500	13.77
Surplus for year...........	$110,136	3.39	$67,844	2.27

*In 1916 these include only $296 for miscellaneous taxes, but in 1915 they included $240,660, no assignment to railway operations being made.

The 1916 gross operating revenues, compared with 1915, show an increase of $257,248 or 8.59 per cent. The operating expenses increased $177,003 or 10.69 per cent, so that the net operating revenue gained $80,745 or 6 per cent.

On July 1, 1916, the wage scale for trainmen was increased 1 cent per hour, making an increase in the payroll of about $30,000 for the last six months of 1916. At the same time a general increase in wages was made in the shops and all other operating departments. These increases, together with increased cost of all materials and fuel, make up a large part of the increased cost of operation. In addition to these increases the charge to operating expenses for depreciation was increased by $60,000, and $41,000 additional was set aside for injuries and damages.

Taxes for the year amounted to $288,679, an increase of $51.167. The net income for 1916 represented an increase of $29,792 or 6.2 per cent. After paying $200,000 in preferred dividends at 5 per cent and the same amount in common dividends at 4 per cent, the company charged out $15,782 for losses, and $50,000 for a miscellaneous reserve to cover purchased securities. Notwithstanding these increases in reserves and expenses, the actual net earnings for the year, added to surplus, amounted to $48.449. The balance shown in accrued depreciation as of Jan. 1. 1917, was $1,383,069. The sum of $175,179 was charged to this account during the year for rebuilding tracks and other replacements. During the year $137,318 was expended for additions and betterments.

The annual report states that the elimination of jitneys, on account of their inability to carry passengers in competition with the company, added a considerable sum to the gross earnings in 1916 as compared with last year. The growth of the cities served was the principal factor, while the good times and activity in all lines of business, together with favorable weather conditions, contributed to the final result.

Bucks County Interurban Railway, Newtown, Pa.—All of the $400,000 of outstanding first mortgage 5 per cent thirty-year bonds of the Trenton, New Hope & Lambertville Street Railway, secured by mortgage of the company to the Trenton Trust & Safe Deposit Company, dated Aug. 1, 1904, will be redeemed and paid at the rate of $1,100 for each $1,000 bond, together with accrued interest, if presented at the office of the trustee on Aug. 1, 1917. The Bucks County Interurban Railway is a consolidation of the Trenton, New Hope & Lambertville Street Railway, Yardly, Morrisville & Trenton Street Railway, Newtown & Yardly Street Railway and the Bucks County Electric Railway.

Cities Service Company, New York City.—The abolition of the present par value of $100 and the exchange of ten shares of new common stock without par value for each one of the present issue was recommended to the directors of the Cities Service Company by a special committee at a meeting of the board on June 22. Application to the New York Stock Exchange for the listing of both the preferred and the common stocks of the Cities Service Company was also favored. Both matters were referred to counsel for their report. A suggestion that debenture bonds be issued as a method of future financing of the Cities Service Company and its subsidiaries by stockholders was adversely reported, so far as action at this time is concerned. The retirement or refunding of subsidiary bonds by this method was objected to by the committee because, owing to the small proportion of such issues with early maturity, the profits in such financing would be used up in called premiums instead of benefiting the stockholders.

General Gas & Electric Company, New York, N. Y.—The holders of the cumulative preferred stock of the General Gas & Electric Company have received circulars stating that the July 1 quarterly dividend declaration has been deferred because of the increases in fuel costs. W. S. Barstow, president of the company, says in part: "Up to a short time ago, the board of directors decided that the discontinuing of the dividends on the cumulative preferred stock would not be necessary. In view, however, of the actual results during the first part of this year, the directors are now unanimous in feeling that it is clearly their duty to defer at this time the declaration of the quarterly dividend on the cumulative preferred stock due July 1. Dividends on this stock, however, are cumulative and as soon as the affairs of the company return to a more normal basis the dividends due on this stock must be made up before any dividends can be paid on any other stocks of the company. The gross revenues of the subsidiary companies are increasing steadily over the corresponding periods of last year. Furthermore, public service commissions are now generally approving increases in rates which have been clearly shown to be productive of a loss to the company. The companies have not, however, received the actual benefit of any such increases up to the present time. For the first four months of this year the increase in the gross revenues of the subsidiary companies has been $76,160 as compared with the same period of last year. The increased operating expenses and taxes, however, for the same four months, which under normal conditions should not have exceeded $46.000 were actually $134,606."

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—The Ohio Public Utilities Commission on June 21 authorized the consolidation of the Youngstown & Sharon Railway, the Mahoning Valley Railway, the Youngstown Park & Falls Railway, the Mahoning Valley Southeastern Railway and the Poland Street Railway with the Mahoning & Shenango Railway & Light Company. Considerations of economy and a desire to centralize the management brought about the decision to consolidate the companies. A syndicate, composed of Lee, Higginson & Company, New York; Drexel & Company, Reilly, Brock & Company, and Graham & Company, Philadelphia, have purchased $500,000 of Mahoning & Shenango Railway & Light Company 5 per cent bonds, due November, 1920, which are being offered at 97½, to yield 5.80 per cent.

Middle West Utilities Company, Chicago, Ill.—The stockholders of the Middle West Utilities Company, at the annual meeting held in Wilmington, Del., recently, approved the proposed amendment of the company's charter and authorized the proposed increase in the preferred and common stocks to $20,000,000 each. The directors were all reelected.

Monongahela Valley Traction Company, Fairmont, W. Va.—The Monongahela Valley Traction Company has declared an extra dividend of $1.25 a share in addition to the regular quarterly dividend of $1.25 a share on the common stock. A dividend of 83 1/3 cents a share has also been declared on the preferred stock, for two months, payable on July 5 to holders of record of June 30. The usual dividend on the common stock is payable on July 16 and the extra on Aug. 16, both to holders of record of June 30. The stockholders of the company are reported to have authorized an increase in the capital stock of the company from $12,000,000 to $16,000,000, of which $4,000,000 is 6 per cent preferred and the balance common stock. At the same time the parity of the stock has been reduced from $100 to $25.

Morris County Traction Company, Morristown, N. J.—Bondholders of the Morris County Traction Company held a meeting at Morristown recently and heard the report of a committee of nine, appointed about three months ago to inquire into the finances of the company. As a result a readjustment of the finances has been agreed upon. The company at present has outstanding $3,000,000 of first mortgage bonds, $1,179,000 of second mortgage bonds and $300,000 of stock. The second mortgage bondholders have agreed to the substitution of income bonds for their holdings. The holders of the first mortgage bonds have agreed that the coupons representing interest now unpaid on the first mortgage bonds shall be cut off and deposited with the National Iron Bank of Morristown and that for the coupons for the next five years shall be substituted new coupons calling for the payment of 1 per cent every six months, beginning next December.

Northern States Power Company, Chicago, Ill.—The Guaranty Trust Company, Harris Forbes & Company, William P. Bonbright & Company, Inc., and H. M. Byllesby & Company, Chicago, Ill., are offering for subscription at 93½ and interest yielding about 5½ per cent $3,500,000 of Northern States Power Company first and refunding mortgage 5 per cent gold bonds dated April 1, 1916, and due April 1, 1941. The amount of these bonds outstanding, including the present issue, is $21,500,000. There are also outstanding $7,556,000 of first mortgage 5 per cent bonds of the Minneapolis General Electric Company, $7,805,000 of ten-year gold notes, $13,233,300 of 7 per cent cumulative preferred stock and $6,170,000 of common stock.

Orleans-Kenner Electric Railway, New Orleans, La.—Some time ago Allen H. Johness, president of the General Realty Company, announced he had formed a local syndicate to take over the property of the Orleans-Kenner Electric Railway and that all the necessary cash had been subscribed. Johnson & Company, controlling the company, had borrowed $150,000 from Bertron, Griscom & Company, New York. Recently when it was reported that the New Orleans Railway & Light Company would secure the property through Johnson & Company Jefferson parish property holders entered a protest. Francis T. Homer of the firm of Bertron, Griscom & Company, who is also president of the American Cities Company, which controls the New Orleans Railway & Light Company, then said his firm would relinquish to the Jefferson parish people all its rights if they would arrange to take care of the indebtedness. Mr. Homer said recently he knew of nothing new in the situation except that the firm had received a letter from J. D. Purcell, who put up most of the original capital for the line, saying the deal with the Johness syndicate was off. Mr. Johness later is reported to have said the negotiations were discontinued partly on account of conditions affecting the property which have originated since an act of purchase was drawn up.

Pittsburgh & Butler Railway, Pittsburgh, Pa.—The property and franchises of the Butler Passenger Railway, which was consolidated with the Pittsburgh & Butler Street Railway in March, 1914, to form the Pittsburgh & Butler Railway, were purchased on June 12 at public sale by Attorney C. F. Hosford, Butler, acting for the bondholders' protective committee of the company. The price paid was $250,000. The public sale of the property and franchise of the company under the decree of the court was fixed for May 9, but as the bids received then were unsatisfactory the sale was postponed to June 12. The property of the Pittsburgh & Butler Street Railway, which with the Butler Passenger Railway went to make up the Pittsburgh & Butler Railway, was purchased under foreclosure on May 9 for $670,250 by R. H. Boggs, president of the Pittsburgh, Harmony, Butler & New Castle Railway, presumably in the interest of that company.

Springfield (Mass.) Street Railway.—The Springfield Street Railway has petitioned the Massachusetts Public Service Commission for approval of an issue of $3,377,000 of twenty-year 6 per cent bonds for general improvements and to pay outstanding debts.

Wisconsin Valley Electric Company, Wausau, Wis.—The First National Bank and Morris F. Fox & Company, Milwaukee, Wis., are offering at 97 and interest $925,000 of first and refunding mortgage 5 per cent bonds of the Wisconsin Valley Electric Company. The bonds are dated May 1, 1917, and are due May 1, 1942, but are callable at 102 and interest on any interest date. The proceeds from the sale of these bonds and of certain stock are to be used to reimburse the company for the purchase of the Merrill and Stevens Point properties, extending the transmission line and for additions.

Dividends Declared

Bangor Railway & Electric Company, Bangor, Me., quarterly, 1¾ per cent, preferred.

Boston & Worcester Electric Companies, Boston, Mass., $1, preferred.

Capital Traction Company, Washington, D. C., quarterly, 1¼ per cent.

Central Illinois Public Service Company, Mattoon, Ill., quarterly, 1½ per cent, preferred.

Chicago City & Connecting Railways, $1.50, preferred participating certificates.

Chicago (Ill.) City Railway Company, quarterly, 2 per cent.

Cincinnati & Hamilton Traction Company, Cincinnati, Ohio, quarterly, 1¼ per cent, preferred; quarterly, 1 per cent, common.

Cincinnati, Newport & Covington Light & Traction Company, Covington, Ky., quarterly, 1⅛ per cent, preferred; quarterly, 1½ per cent, common.

Cincinnati (Ohio) Street Railway, quarterly, 1½ per cent.

Cities Service Company, monthly, ½ of 1 per cent, common and preferred; ½ of 1 per cent, common, payable in common stock.

Consolidated Traction Company of New Jersey, Newark, N. J., 2 per cent.

International Traction Company, Buffalo, N. Y., quarterly, 1¾ per cent, on 7 per cent cumulative first preferred; quarterly, 1 per cent, on 4 per cent cumulative preferred; 1 per cent, common.

Iowa Railway & Light Company, quarterly, 1¾ per cent, preferred.

Little Rock Railway & Electric Company, Little Rock, Ark., 3 per cent, common and preferred.

Manchester Traction, Light & Power Company, Manchester, N. H., quarterly, 2 per cent.

Mohawk Valley Company, New York, N. Y., quarterly, 1½ per cent.

New England Investment & Security Company, Springfield, Mass., 2 per cent, preferred.

New Orleans Railway & Light Company, New Orleans, La., quarterly, 1¼ per cent, preferred.

New York State Railways, New York, N. Y., quarterly, 1¼ per cent, preferred; quarterly, 1 per cent, common.

Nova Scotia Tramways & Power Company, Halifax, N. S., 3 per cent, preferred.

Philadelphia & Western Railway, Upper Darby, Pa., quarterly, 62½ cents, preferred.

Porto Rico Railways, Ponce, P. R., quarterly, 1¾ per cent, preferred.

Reading (Pa.) Traction Company, 75 cents.

Republic Railway & Light Company, Youngstown, Ohio, quarterly, 1½ per cent, preferred; quarterly, 1 per cent, common.

Ridge Avenue Passenger Railway, Philadelphia, Pa., quarterly, $3.

Washington Water Power Company, Spokane, Wash., quarterly, 1 per cent.

West India Electric Company, Ltd., Kingston, Jamaica, quarterly, 1¼ per cent.

Wisconsin Edison Company, Inc., New York, N. Y., quarterly, 50 cents.

Electric Railway Monthly Earnings

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
CITIES SERVICE COMPANY, NEW YORK, N. Y.					
1 m., May, '17	$1,565,425	$28,341	$1,537,084	$234	$1,536,850
1 " " '16	709.085	20,113	688,972	44,121	644,851
12 " " '17	15,218,272	287,038	14,931,234	42,624	14,888,610
12 " " '16	6,012,968	201,343	5,811,625	503,454	5,308,171
CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.					
1m., Apr., '17	$233,439	*$158,628	$74,811	$66,499	$8,312
1 " " '16	211,944	*134,794	77,150	66,287	10,863
12 " " '17	2,959,916	*1,893,698	1,066,218	810,671	255,547
12 " " '16	2,717,239	*1,591,665	1,125,574	798,254	327,320
KANSAS CITY (MO.) RAILWAYS					
1 m., May, '17	$627,086	*$432,652	$194,434	$129,769	††$41,961
1 " " '16	642,691	*410,991	231,700	117,819	††53,898
12 " " '17	6,778,017	*4,558,355	2,220,662	1,430.640	††441,393
12 " " '16**					
KEY WEST (FLA.) ELECTRIC COMPANY					
1 m., Apr., '17	$10,874	*$7.291	$3,583	$2,511	$1,072
1 " " '16	9,759	*5,930	3,829	2,519	1,310
12 " " '17	122,673	*82,859	39,814	30,196	9,618
12 " " '16	113,292	*76,659	36,633	30,542	6,091
LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.					
1 m., Apr., '17	$68.053	*$50.275	$11.778	$15,702	$2,076
1 " " '16	60,400	*41,224	19.176	16,120	3,056
12 " " '17	836,375	*596.756	239,619	185,585	54,034
12 " " '16	754,476	*496.289	258,187	191,663	66,524
NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.					
1 m., Apr., '17	$201.591	*$130.576	$71,015	$40,714	$30,301
1 " " '16	193,641	*113,361	80.280	42,815	37,465
12 " " '17	2,423.840	*1.511,622	912,218	501,198	411,020
12 " " '16	2,207,502	*1,358,923	848,579	514,503	334,076
NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO					
1 m., Apr., '17	$528,240	$312,917	$215,323	$83,919	$131,404
1 " " '16	399,830	192,744	207,086	95,436	111,650
4 " " '17	2,020,328	1,217,468	802,860	329.358	473.502
4 " " '16	1,518,582	726,719	791,863	388,986	402,677
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.					
1 m., Apr., '17	$175,359	*$104,007	$71,352	$29.158	$42,194
1 " " '16	146.494	*91,984	54,510	28,724	25,786
12 " " '17	2,028.964	*1,200.271	828,693	348,357	480,336
12 " " '16	1,801,013	*1,099,351	701,662	337,140	364,522
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.					
1 m., Apr., '17	$23,865	*$18,822	$5,043	$7,196	†$2,153
1 " " '16	24,384	*15,899	8,485	7,137	1,348
12 " " '17	311,379	*229,879	81.500	86,465	4,965
12 " " '16	296,777	*179,699	117,078	89,444	27,634
PENSACOLA (FLA.) ELECTRIC COMPANY					
1 m., Apr., '17	$24,057	*$15,189	$8,868	$7,813	$1,055
1 " " '16	23,391	*12,657	10.734	7,678	3,056
12 " " '17	290,118	*167,831	122.287	92.899	29,388
12 " " '16	271,383	*150,630	120,753	87.617	33,136
PHILADELPHIA (PA.) RAPID TRANSIT COMPANY					
1 m., May, '17	$2.570,440	$1,436,859	$1.133.581	$810.894	$322,687
1 " " '16	2,391,370	1,296,001	1,095.369	815,599	279,770
11 " " '17	26,027,835	14,599,131	11,428.704	8,953.108	2.475,596
11 " " '16	23,526,374	13,106,169	10,420.205	8.977.507	1.442,698
PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.					
1m., May, '17	$474.433	$224.584	$249.849	$217.826	$32,023
1 " " '16	445,223	212,914	232,309	225,705	6,604
12 " " '17	5,647.205	2.538,931	3.108.274	2.696.308	411.966
12 " " '16	5,457,872	2,565,914	2,891.958	2,699.644	192.314
PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.					
1 m., Apr., '17	$754,687	*$460.884	$293,803	$191,025	$102,778
1 " " '16	645,088	*422,900	222,188	184,290	37,898
12 " " '17	8,571,266	*5,244,570	3,326,696	2,241,688	1,085,008
12 " " '16	7,643,873	*4,879,073	2,764,800	2,192,916	571,884
REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO					
1 m., May, '17	$371.745	*$257,291	$114.454	$82.638	‡$37,984
1 " " '16	326,400	*199.694	126,706	68.446	‡61,443
12 " " '17	4,228,747	*2.623,123	1,605.624	895,941	‡738,895
12 " " '16	3,523,962	*2.079,992	1,443,970	743,054	‡713,232
SAVANNAH (GA.) ELECTRIC COMPANY					
1 m., Apr., '17	$76.968	*$51,554	$25,414	$23.908	$1,506
1 " " '16	64,897	*43,257	21,640	23,501	†1,861
12 " " '17	867,963	*574.882	293,081	285.198	7,883
12 " " '16	785,244	*523.311	261,933	261.934	†16.744
TAMPA (FLA.) ELECTRIC COMPANY					
1 m., Apr., '17	$82.261	*$47,183	$35,078	$4,372	$30,706
1 " " '16	78,959	*44,595	34.364	4,394	29,970
12 " " '17	983,651	*537,088	446,563	52,305	394,258
12 " " '16	987,491	*515,777	471,714	52,221	419,493

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*Includes taxes. †Deficit. ‡Includes non-operating income.

**During the fiscal year to February 14, 1916, the property was operated by the receivers under the old securities; and the figures for this period, being without value in a comparative statement, are not shown here.

††Includes addition of miscellaneous income and deduction of Kansas City surplus reinvested in plant.

Traffic and Transportation

Seattle Service Decision

A Review of the Issues Involved and the History of the Case Upon Which U. S. Supreme Court Passed on June 11

The Supreme Court of Washington, D. C., on June 11, in the case of the Puget Sound Traction, Light & Power Company, Seattle, appellant, against the State Public Service Commission, appellee, affirmed the judgment of the district court for the Western District of Washington. The traction company asked the district court for a temporary injunction restraining the commission, after a trial on its merits, from enforcing so much of a commission order as the company alleged violated the fourteenth amendment of the Constitution, Art. 1, Sec. 10, and the public service law of the State. The order directed:

"That the defendant furnish sufficient cars to provide seats for substantially all persons using the Alki Point and Fauntleroy Park lines."

A temporary injunction was granted as to the third section of the order, but denied as to the remainder. Appeal was from this denial, but the Supreme Court affrmed the action of the district court. The application of the company for an injunction on the first and second sections of the commission's order will now be heard on its merits in the district court.

James B. Howe, general counsel for the company, states that the decision of the Supreme Court does not finally determine the main questions at issue. Mr. Howe is quoted as follows:

"Our original complaint had to do only with the Alki and Fauntleroy Park lines, mentioned in the decision of the Supreme Court. We have filed an amended complaint, showing the situation as affecting the entire Seattle system, and we are now fully confident, in view of the decision on June 11, that our contention will be sustained by the court on the final argument."

HISTORY OF THE CASE

The Puget Sound Traction, Light & Power Company was the owner of two franchises under which were operated two street railway lines known as the Fauntleroy line and the Alki line. The franchises for these lines terminated at the intersection of Yesler Way and First Avenue. From Yesler Way north to Virginia Street the company owned another line operated under another franchise. The Public Service Commission made an order requiring the company to operate the Fauntleroy and Alki cars so that instead of passengers paying a 5-cent fare and obtaining a transfer at the intersection of Yesler Way and First Avenue, in order to entitle them to proceed further north, they must be carried in the same car from the southern terminals of the Fauntleroy and Alki lines to Virginia Street, and from Virginia Street south to the southern terminals of those lines, without change. The effect of this order enabled passengers to travel on a 4-cent ticket instead of for a 5-cent fare and obtain a transfer. The commission also made an order requiring the company to furnish every passenger with a seat except in case of emergency.

The company filed a complaint in the federal court and attacked the order of the commission, on the ground that the order constituted a violation of the contract contained in the company's franchise and deprived it of its property without due process of law. The Fauntleroy and Alki lines never paid operating expenses, and the court found that as the lines extended over tidelands, which were unsettled, the greater the amount of business done by the company the greater would be the loss to the company, owing to the long haul. The court denied the company relief upon the ground that it did not appear from the complaint that the other lines of the company did not produce a fair return on the value of all of the company's street railway system.

A temporary injunction was granted as to that part of the order requiring a seat for every passenger, and denied as to that part which required through service. An amended complaint was filed by the company, alleging that the return from the entire street railway system was inadequate, and the case is still pending on the amended bill.

An appeal from the order denying a temporary injunction was taken to the Supreme Court of the United States, but the order of the district court was affirmed. A copy of the opinion of the Supreme Court had not yet been received in Seattle when this account was prepared, but it is understood that the Chief Justice and Justices McKenna and McReynolds dissented. It is also understood from the newspaper report that the court held it incumbent upon the company to show that its street railway system did not produce a fair return, and in the absence of such showing, no relief could be had because particular lines failed to earn operating expenses.

The company contended that inasmuch as each line was constructed and operated under a separate franchise, which was sold by the city to the highest bidder, the fact that the various franchises subsequently were vested in a single owner did not change the obligations of the owner from those stated in the franchises. The company also contended that, it having been admitted that the reason the two lines were operated at a loss was not from lack of business but because the fare allowed by law was less than a reasonable rate and less than the value of the service rendered, the company was deprived of its property without due process of law, even though from other property the revenue was sufficient to yield the company a return on the value of all of its property.

The case will proceed to trial upon the amended bill and will probably be disposed of on its merits within the next six months.

Employees' Bulletin for M. V. T.

The Monongahela Valley Traction Company, Fairmont, W. Va., has issued the first number of a publication called the *M. V. T. Company Employees' Magazine.* The paper is edited by Shannon Allen and will be published on the fifteenth of each month. The first issue contains thirty-four pages of editorial matter with main departments as follows: General News, Editorials, Railway, Mining, Gas, Power and Home and Garden. Advertising is also carried. A short message in this number from General Manager E. B. Moore to the employees contains the following paragraph:

"The business of this company is very diversified, consisting of railways, electric lighting, power, natural gas and coal mining, and a little later artificial gas will be added. Due to this diversity there is practically no personal contact between the employees of some of the different departments. I hope this magazine may be the means of bringing about a closer relationship and unity of interest among all employees, including the officials, who, of course, are employees, too."

Texas Has New Traffic Law

The State of Texas has enacted a new State highway law which became effective June 20. The law provides for the licensing of motor vehicles to produce revenue which will be used in improving the State roads. Jitneys are affected inasmuch as a commercial vehicle within the terms of the act is held to be any vehicle carrying passengers or freight for hire. The act takes from the various cities the right to tax automobiles or other motor vehicles, and imposes a State license tax of 35 cents per horsepower on pleasure automobiles, with a minimum charge of $7.50 and a graduated tax ranging from $25 to $300 a year on commercial automobiles according to their gross weight. It provides that no other license tax shall be imposed by city or county. This provision, it is claimed, will prevent any city from imposing a regulatory tax, which will mean that the cities will have no supervision over jitney buses operating on their streets. This point will likely find its way into the courts for judicial determination and the cities will make a strong fight for their right to regulate jitneys.

Jitneys in Dallas are now operating practically without restriction, since the enforcement of the ordinance recently approved by the voters of Dallas, which was initiated by the members and friends of the Jitney Drivers' Association, has been enjoined by the railway companies. Several commissioners of Dallas, however, have expressed their determination to enact other regulatory measures. Commissioner Doran has come out openly for an ordinance that will restrict the jitneys to certain streets and impose on them a tax, such tax to go into a fund for the maintenance of paving. He declares that the jitneys use the paved streets and as a matter of equity should contribute liberally to their original cost and upkeep.

I. U. T. Safety-First Banquet Canceled.—The semi-annual safety-first banquet of the Union Traction Company of Indiana, Anderson, Ind., which was to have been held this month, was canceled on account of the present national conditions.

Free Transfers Asked in Duluth.—Park Point residents have petitioned the City Council of Duluth, Minn., to bring pressure to bear upon local traction companies to secure free transfer privileges between the lines of the Duluth Street Railway, which serves the city proper, and the Park Point Traction Company, which serves Minnesota Point only. The lines are separated by the Duluth ship canal and a charge of 2 cents is now made for transfers.

Women to Check Traffic.—The Beaver Valley Traction Company, New Brighton, Pa., is planning to employ women to check traffic. An advertisement in the local papers on June 23 reads as follows: "Wanted: Five women to check traffic; must be ex-school teachers, teachers on vacations or women of equal school training. Short hours. Good pay. Apply in own handwriting or in person to the Beaver Valley Traction Company, Junction Park Office, New Brighton."

Jersey Road Wants 6-Cent Fare.—The North Jersey Rapid Transit Company, Hohokus, N. J., operating between Warren Point and Suffern, N. Y., has applied to the State Board of Public Utility Commissioners for permission to increase its fare from 5 cents to 6 cents. H. H. Parmelee, receiver for the company, asked the commission to authoize an increase of fare to 6 cents in the local municipalities through which the line is operated. After the hearing the testimony was laid over for action by the board after conference.

Jitney Insurance Company Quits Newark Field.—The Manufacturers' Liability Insurance Company, Jersey City, N. J., which has been bonding some of the jitneys in Newark, has decided to abandon the Newark field and has canceled the seventy-five policies it held there. The company is a mutual concern sharing its profits with the policyholders. It is said that the reason for this action was that the prevalence of jitney accidents in Newark made the business unprofitable. It is said the policies will be taken over by the Manufacturers' Casualty Insurance Company, Philadelphia, Pa.

Pennsylvania Commission Lowers Fare.—The Public Service Commission of Pennsylvania has ordered the Eastern Pennsylvania Railways to reduce its fare to 5 cents instead of 10 cents, now charged on its line from Pottsville to the limits of the former Yorkville borough. The change is the result of years of effort of the Pottsville Retail Merchants' Association. The company had sought to justify the former fare on account of rentals paid to the People's Railway, which owns the charter rights and original roadbed. Under the agreement between the companies the more passengers carried the higher is the rental.

Springfield to Improve Jitney Regulation.—A new jitney ordinance being considered by the City Council of Springfield, Mass., would prohibit persons engaged in other occupations from operating passenger-carrying automobiles and would bond each driver to the extent of $1,000 instead of bonding the machine owners, as at present. It is hoped to eliminate objectionable features of the ordinance passed last year. Part-time operators will probably be prohibited from obtaining a license in order to decrease the number of jitneys and force incompetent drivers out of business. Other clauses relate to the display of signs, number of working hours, the operating routes and similar measures.

Temporary Franchise Amendment Proposed.—Two measures, which are intended to give the Virginia Railway & Power Company relief from the increased cost of operation and maintenance, were presented recently before the Board of Aldermen of Richmond, Va. The ordinances were drawn in the form of amendments to franchises held by the company. They would abolish school children's and workingmen's tickets, which are now sold at the rate of six for 25 cents, and would also grant the company the privilege of issuing only one transfer. A 10-per cent city tax on the company's gross receipts is specified to replace the graded tax in effect at present. The ordinances are said to be virtually war measures since the operative period has been set at only five years.

Newspaper Publicity for Kansas City Railways.—An interesting development of the publicity department maintained by the Kansas City (Mo.) Railways is that it is answering many queries and complaints to the newspapers directed against the car service. One of the newspapers conducts a "Speaking the Public Mind" column, where, in the past, criticisms of the company were published. Recently the editor of that department has been sending some of the communications to the railway company and its publicity department provides the correct information even though the response must be the frank admission that an employee had exceeded his authority or that the condition was one which had not yet been remedied though a solution was being sought.

Hearings Begun on Freight Advance.—The Public Service Commission for the Second District of New York on June 23 began its investigation of the 15 per cent advance in freight rates proposed by the carriers of the State. All the railroads operating in the State were represented and produced copies of statements filed with the Interstate Commerce Commission showing approximate estimates of increased cost of coal, labor and material and estimates of prospective earnings on the proposed advanced rates, using the business of 1916 as a basis and following along the same lines of proof as they did before the Interstate Commerce Commission. The hearing has now been closed and the interested parties have received permission to file briefs not later than June 27 to support their contention.

H. C. L. Kills the Louisville Jitneys.—Competition of the jitney with the Louisville (Ky.) Railway will formally fade away on July 1, according to an announcement made by the Louisville Jitney Bus Company to the effect that the high cost of living has rendered the venture unprofitable. It is understood that thirty-four buses are authorized to operate under the blanket liability bond carried by the company. During the two years since the buses began to operate gasoline has advanced in price from 9 cents to 24 cents with the result that the business has not been profitable. Operators have been dropping out until service is given on only two instead of on all of the principal streets of the city as formerly. It is said that some free-lance buses are in operation that do not observe the city ordinance requiring a $5,000 liability bond, but they do not constitute serious competition.

Trials of "Free-Bus" Operators Begun.—Lester Thayer, first of the seventy-nine jitney drivers on trial in Seattle, Wash., charged by the Puget Sound Traction, Light & Power Company with operating without the $2,500 bond required by law, was discharged by Justice Otis Brinker after he had produced an alibi. Thayer was charged with having carried for hire in his "free-donation" bus, O. A. Wise, an investigator for the traction company, on June 1. Thayer proved that he was not operating his bus on that date. Judge Brinker announced that the other seventy-eight cases will be taken up as soon as possible. Attorneys for the defendants say that they will demand a separate trial and jury in each case. Arrests of jitney drivers for the second and third times on criminal charges for operating without a surety bond have been discontinued. The prosecuting attorney of King County gave notice to the Puget Sound Traction, Light & Power Company that no more complaints would be issued by his office against jitney drivers who were already at liberty under bond charged with having violated the bonding law.

Legal Notes

CHARTERS, ORDINANCES, FRANCHISES

FEDERAL COURTS.—*Generating Electric Power for Railway Service is Public Use Even if There is a Sale of Surplus Power.*

The condemnation of certain water rights by a street and interurban railway company, conformably to the local law, cannot be said to be for a private use, on the ground that the contemplated works will produce much more power than will be needed for the railway, when the company's charter empowers it to sell the surplus power and the taking, according to the findings of the state courts, was with intent in good faith to carry on the public business authorized by the charter, *i. e.*, to build and operate a railway between points named, and it was further found that it was necessary to generate electric power on the stream in order to operate the railway, and that, in order fully to develop the company's water power for such purpose, it was necessary to condemn the rights in question. (Hendersonville Light & Power Company and Saluda-Hendersonville Interurban Railway v. Blue Ridge Interurban Railway, 37 Supreme Court Rep., 440.)

NEW YORK.—*Power House Repair Shop a "Factory," and Hours of Rest Are Required.*

The labor law defines a "factory" as including any mill, workshop, or other manufacturing or business establishment, where one or more persons are employed at labor, except power houses, generating plants, barns, storage houses, sheds, and other structures owned or operated by a public service corporation, other than construction or repair shops. Defendant, a subsidiary corporation of a city rapid-transit company, maintained in the basement of its power house a machine shop, operated by power, where repairs were made and small parts manufactured and kept in stock. The machinists assembled parts and adjusted them when machines broke down. Held, that such machine shop was a factory, within the statute requiring twenty-four consecutive hours of rest in every calendar week. (People v. Transit Development Company, 165 New York Sup., 114.)

LIABILITY FOR NEGLIGENCE

KENTUCKY.—*Trespass Committed When Car Left Track.*

Where defendant's street car left the track and ran into the house of plaintiff, thereby injuring her, a trespass was committed, and she may recover without showing negligence on the part of the motorman. (Kentucky Traction & Terminal Company v. Grimes, 194 Southwestern Rep., 1048.)

PENNSYLVANIA.—*Beginning of the Passenger Relation.*

One boarding a street car intending to become a passenger, even though no fare has been collected before he sustains injury, is a passenger, and not a trespasser simply because he entered in an illegal manner and in violation of company's rule. (Berkebile v. Johnstown Traction Company, 99 Atlantic Rep., 871.)

WEST VIRGINIA.—*Federal Employers' Liability Act Does Not Apply to Employees in City Service of Interstate Line.*

An electric railway company which operates an urban car line, and also other lines connecting therewith and extending into another state, is both an intrastate and in interstate carrier. But the federal employers' liability act (Act Cong. April 22, 1908, Chap. 149, 35 Stat. 65 [U. S. Comp. Stat. 1913, Secs. 8657-8665]), does not apply in the case of injury to a servant of such company, who is operating a street car, confined to the urban lines and not, at the time of injury, carrying interstate passengers or traffic. To make the federal act applicable, the injured servant must be engaged in interstate commerce at the time of injury. (Watts v. Ohio Valley Electric Railway, 88 Southeastern Rep., 659.)

Personal Mention

T. G. Lowry has been appointed chief engineer of the Peoria (Ill.) Railway Terminal Company.

R. A. Becker has been appointed engineer of overhead construction for the Southern Illinois Light & Power Company, Hillsboro.

J. K. Blish has been elected vice-president of the Galesburg & Kewanee Electric Railway, Kewanee, Ill., succeeding H. W. Crane.

John Roach has been appointed roadmaster of the East St. Louis & Suburban Railway, East St. Louis, Ill., succeeding J. C. Dew.

John H. Boyd has been appointed treasurer of the Uncanoonuc Incline Railway & Development Company, Manchester, N. H.

James G. White, president of J. G. White & Company, Inc., New York, has been elected second vice-president of the Merchants' Association of New York for the coming year.

Paul Reinking, who for several years has been auditor of the Fort Wayne & Decatur Traction Company, Decatur, Ind., has resigned to take a position with the Fort Wayne Corrugated Paper Company.

A. H. Cady has been made acting superintendent of the Detroit, Jackson & Chicago Railway, Detroit, Mich., in the place of William J. Dawson, who has been placed in temporary charge of the employment department of the Detroit United Railway, which controls the former company.

William J. Dawson, superintendent of the Detroit, Jackson & Chicago Railway, which is controlled by the Detroit (Mich.) United Railway, has been appointed acting superintendent of employment of the latter company, succeeding A. F. Brown, who has been kept from his duties on account of illness.

A. B. Coryell, who for the last four years has been superintendent and purchasing agent for the Moncton Tramway Electricity & Gas Company, Moncton, N. B., has resigned, effective July 1, to enter business for himself in Buffalo, N. Y. Mr. Coryell has been engaged in electric railway and lighting work for more than twenty-five years. During this time he has had charge of the construction and management of properties in different parts of the country, mainly in the southern states.

E. C. Macy has been appointed engineer of the Stone & Webster division of construction and engineering, with headquarters in Seattle, Wash., succeeding W. L. Locke. Mr. Macy has for many years been connected with the construction forces of the Stone & Webster organization. He had charge of the construction of the Seattle-Everett interurban road and the Bellingham-Mount Vernon line of the Pacific Northwest Traction Company. Mr. Macy was also associated with Chief Engineer S. L. Shuffleton in the construction of the large steam generating plant at Buffalo, N. Y., carried out by the Stone & Webster Engineering Corporation.

Sir Albert H. Stanley, who resigned last December as managing director of the London Underground Electric Railways, London United Tramways, Ltd., Metropolitan District Railway and the London General Omnibus Company, London, Eng., to accept the appointment as minister of commerce and president of the Board of Trade in the British Cabinet, was the subject of a recent communication to the Philadelphia *Public Ledger*. Many instances in the life of Sir Albert are quoted to portray his career in public service work in America before he went to England. The article states that in his opinion English industries and public utilities have profited much from American methods and that they receive more co-operation from the British public than do American industries from our mixed population. It is said that Sir Albert's American business experience and his everlasting ambition to "get on top" were determining factors in his appointment to a place in the Cabinet.

J. T. Hutchings, who has been general manager of the Rochester Railway & Light Company, Rochester, N. Y., since 1909, has, in addition to his present position, been elected vice-president of the company. During his connection with the company he has been instrumental in building up the property to its present prominent position and has greatly improved the company organization. Mr. Hutchings is a graduate of the Massachusetts Agricultural College at Amherst. For a short period after his graduation he was engaged in construction work for the Thomson-Houston Electric Company and later became assistant superintendent of the Germantown Electric Light Company. In 1891 he accepted a similar position with the West End Electric Company of Philadelphia and later was appointed superintendent. When this company was consolidated with others in 1897 as the Philadelphia Electric Company Mr. Hutchings was appointed electrical engineer and continued in that position until 1904, when he became connected with the Rochester Railway & Light Company as superintendent of the electrical department. Two years later he was appointed assistant manager and in 1909 general manager.

J. B. Potter, who has been manager of the New York & Stamford Railway, Port Chester, N. Y., for the last ten years, has resigned, effective July 1, to accept a position with Sanderson & Porter, engineers, New York. Mr. Potter was with that firm from 1898 to 1900 in the capacity of constructing engineer in charge of the construction of an electric railway from Central Village, Conn., to Webster, Mass. His first work in the railway field was with the Westinghouse Electric & Manufacturing Company in the year 1897. In 1900 Mr. Potter was appointed manager and treasurer of the Webster & Dudley Street Railway and after two years in this capacity he was made, in addition, manager of the Worcester & Webster Street Railway properties. These remained under his management until September, 1903, when the two companies were leased to the Worcester & Connecticut Eastern Railway and Mr. Potter was made general superintendent. This company was afterward known as the Consolidated Railway, Putnam Lines. He was appointed general superintendent of the Worcester & Southbridge Street Railway Company in addition to his duties as general superintendent of the Putnam Lines of the Consolidated Railway in the year 1905 and held that position until his appointment as manager of the New York & Stamford Street Railway and the Stamford Lines of the Consolidated Railway in 1907. In his new position Mr. Potter will have charge of the operation of the public utilities in which Sanderson & Porter are interested.

Wilbur C. Fisk, president and general manager of the Hudson & Manhattan Railroad, New York, was honored on June 27 by election to the presidency of the New York Electric Railway Association to succeed James P. Barnes. He has just completed a term as vice-president of the association, and this, together with active committee work, has prepared him adequately for the greater responsibilities as president. Mr. Fisk is a native of New York, having been born in New York City on Feb. 22, 1868. He was graduated from Princeton University in 1890 with the degree of civil engineer and afterward entered the banking house of Harvey Fisk & Sons, New York, founded by his father, Harvey Fisk. He became a member of the firm in 1898. Soon after Harvey Fisk & Sons undertook the financing of the Hudson & Manhattan Railroad at the request of the directors and William G. McAdoo, then president, Mr. Fisk was elected vice-president of the company. In 1908 he assumed also the duties of general manager and had entire control of the operation of the road. When Mr. McAdoo became Secretary of the Treasury under President Wilson Mr. Fisk was elected president of the Hudson & Manhattan to succeed him.

W. C. FISK

B. W. Arnold, as noted last week, is the new manager of the Eastern Wisconsin Electric Company, which consists of the railway property in Oshkosh and the interurban lines in Neenah, Omro and Fond du Lac, including the Fond du Lac city line. Mr. Arnold began railroad work in 1899 with the Wheeling & Lake Erie Railway, and later entered the employ of the Lake Shore Electric Railway, Cleveland, Ohio, as train dispatcher. He resigned in 1902 to become chief dispatcher of the Muncie, Hartford & Fort Wayne Railway, Muncie, Ind., and continued in that position until 1907, when he entered the service of the Illinois Traction System, McKinley Lines, as superintendent of the southern division. Mr. Arnold continued in that capacity for a time, with headquarters at Springfield, and was later transferred to Decatur as superintendent of the Decatur division in charge of all lines running into that city. He was next made chief clerk to the general superintendent of the system, and in 1910 was appointed superintendent of transportation of the Chicago, Ottawa & Peoria Railway, the northern division of the Illinois Traction System, which position he has held until the present time.

B. W. ARNOLD

E. R. Kelsey, advertising manager of the Toledo Railways & Light Company, Toledo, Ohio, one of the H. L. Doherty properties, returned recently from points in North Carolina, Georgia, Oklahoma and Missouri where he visited other companies of the Doherty organization. Mr. Kelsey has collected information for a series of service talks which he intends to prepare.

Obituary

John Lane, formerly superintendent of the Boston & Northern Street Railway, now known as the Bay State Street Railway, Boston, Mass., died recently at his home in Providence, R. I.

Edward E. Higgins, from 1893 to 1900 co-editor of the STREET RAILWAY JOURNAL, died on June 22, at Clinton, Conn. He had been seriously ill for about two weeks. Mr. Higgins was born in Chelsea, Mass., in 1864 and was graduated from the Massachusetts Institute of Technology in its electrical engineering department in 1886. His first connection with the electrical industry was as assistant electrician of the Standard Electric Company of Vermont. In 1888 he joined the sales staff of the Sprague Electric Railway & Motor Company and continued with its successor, the Edison General Electric Company, until 1891, when he accepted the management of the Short Electric Railway Company. This company, a few years before, had been incorporated by Sidney H. Short to build and install electric railways. After the sale of this company to the Westinghouse Electric & Manufacturing Company, about a year later, Mr. Higgins traveled extensively abroad, and on his return to the United States he opened an office in New York as street railway and financial counsel. This led to the contribution of a series of articles to the STREET RAILWAY JOURNAL on street railway investments. These articles were afterward republished in book form, and Mr. Higgins was invited to become one of the editors of the paper. During this connection he specialized on the financial side of electric railway operation, and in 1894 largely due to his initiative, the *Street Railway Red Book*, later known as the *McGraw Electric Railway Manual*, made its appearance as an annual publication. He retired from the STREET RAILWAY JOURNAL in 1900, following the purchase by him and others of the controlling interest in the magazine *Success*. Recently Mr. Higgins has been vice-president and treasurer of the Moore-Cottrell Subscription Agencies.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Columbus, Delaware & Marion Electric Company, Columbus, Ohio.**—Incorporated to take over the Columbus, Delaware & Marion Railway, recently sold under foreclosure to Ralph Beaton, Columbus. Capital stock, $1,000, to be increased to a much larger amount. Incorporators: Samuel L. Finn, Daniel Blau, I. Webb, Ira Cranford and M. F. Sheeler.

FRANCHISES

Syracuse, N. Y.—The New York State Railways has applied to the Public Service Commission for the Second District of New York for its approval of franchises for a number of minor improvements in its track systems in Syracuse to facilitate the operation of the new single-end cars.

Tonawanda, N. Y.—The Public Service Commission for the Second District of New York has approved the extension by the International Railway of its Grand Island Ferry line along the River Road to the Wickwire Steel Company's plant.

Dayton, Ohio.—The Peoples Railway has asked the City Commission for permission to extend its line on the Covington Pike to a point beyond Fairview. The cars are now being operated to the point to which it is desired to extend the line through an arrangement with the Dayton, Covington & Piqua Traction Company.

East Cleveland, Ohio.—The City Council of East Cleveland has approved a twenty-five year franchise to the Cleveland Railway in East Cleveland. The franchise will be submitted to a referendum vote on July 1. The company is to pave its portion of the streets, extend the Superior Avenue line to Euclid Avenue and build a crosstown line on a location yet to be fixed.

Pomeroy, Ohio.—The Ohio River Electric Railway & Power Company has asked the City Council for a new twenty-five year franchise in Pomeroy.

TRACK AND ROADWAY

Municipal Railways of San Francisco, San Francisco, Cal.—Bids were recently opened by the Board of Public Works for the construction of the Municipal Railway line through Twin Peaks tunnel and out to the junction of Junipero Serra and Sloat Boulevards, the lowest bidder being Eaton & Smith, San Francisco, at $80,467.

Delaware & Maryland Traction, Light & Power Securities Company, Wilmington, Del.—This company has secured the franchises of the Fox Creek Railroad Company, of Dorchester County, and the Peninsula Traction Company, of Talbot County, and proposes to construct an electric line to connect Cambridge with Bishop's Head, on the Chesapeake Bay, and a line connecting the principal points on the Eastern Shore with Elkton. The line is expected to pass through Chestertown, Centreville, Church Hill, Denton, Easton, Hurlock and East New Market. The Fox Creek Railroad Company secured a charter about twenty years ago and a bond issue of $90,000 was voted by the county to purchase stock in the road, but it has never been built. It is said that the company also proposes to construct a line from Wilmington to Salisbury, with a branch line from Bridgeville to Williamsburg, and thence to Easton. Lindes & Company, Philadelphia, are interested. [June 23, '17.]

Seaboard Air Line Railway, Savannah, Ga.—This company has inaugurated a gas-electric train service between Savannah and Jacksonville, eliminating the steam service between these two points.

Union Traction Company, Anderson, Ind.—Extensive improvements are being made by the Union Traction Company in its roadway equipment in and around Fort Benjamin

Harrison. The right-of-way between Indianapolis and the fort is being double-tracked between Long's siding to Keystone, near the fair grounds. This will give the company 7 miles of double track between Indianapolis and the fort and will greatly facilitate the handling of cars. Other improvements also are being made to enable the company to better the service and handle a great amount of trains to and from the army post during the training camp period.

Manhattan City & Interurban Railway, Manhattan, Kan.—This company reports that it expects to erect a new steel bridge, possibly using a second-hand deck girder bridge of about 50 to 600 ft. length.

Louisville (Ky.) Railway.—Definite announcement by the Louisville Railway as to its plans for the extension of service to the army camp which will be established in Louisville are being delayed pending the decision of the Fiscal Court of the county on application of the company for a franchise. This is involved also with the matter of final platting of the camp grounds. Meanwhile the company is going ahead with preparations for beginning construction as soon as the route is decided on.

Northern Massachusetts Street Railway, Athol, Mass.—Plans are being considered for an electric freight line to extend from Gardner to Templeton, connecting there with the Boston & Albany Railroad. If these plans go through the Parker Street railroad bridge may have to be altered to a great extent in order to allow freight cars to pass beneath it. It is understood that the problem of fixing the tracks to make them fit for freight service is soon to be turned over to the engineering department.

Mesaba Railway, Virginia, Minn.—This company contemplates replacing its wooden poles with steel poles in Gilbert.

United Railways, St. Louis, Mo.—The Chouteau Avenue viaduct over the Missouri Pacific and Frisco railroad tracks, between Spring and Vandeventer Avenues, has been opened to street car traffic. The viaduct is about 1000 ft. long and cost more than $200,000. It was built by the city, but paid for by the two railroads and the United Railways.

Public Service Railway, Newark, N. J.—This company plans to construct a line on Avenue R from the Lincoln Highway to Port Newark Terminal.

New York & Queens County Railway, New York, N. Y.—The project to construct a line through Peartree and Roosevelt Avenues, Corona, which was to have connected Jackson Avenue with the Alburtis Avenue terminal of the Corona elevated line, has been abandoned by the New York & Queens County Railway as a result of protests by residents of Roosevelt Avenue, who objected to having the line run through their thoroughfare.

Youngstown & Niles Railway, Youngstown, Ohio.—A contract has been awarded by the Youngstown & Niles Railway to J. W. Garland, Inc., Ravenna, for grading the roadbed of its proposed line from Youngstown to Niles. This will be a single track electric line about 6 miles long and will pass through the new town of MacDonald, where the Carnegie Steel Company is erecting a new steel plant and building a new town site for the housing of its workers. The contractor plans to sublet some of this work. [Feb. 10, '17.]

St. Thomas (Ont.) Street Railway.—It is reported that the St. Thomas Street Railway plans the construction of an extension to cost about $40,000.

Toronto (Ont.) Civic Railway.—The City Council of Toronto will call for bids for the construction of the proposed Bloor Street extension.

Klamath Falls (Ore.) Municipal Railway.—The City Council of Klamath Falls has formally accepted the bid and awarded the contract to Robert E. Strahorn, Portland, at $300,000, for the construction of a municipal railway from Klamath Falls to Dairy, 20 miles, and for certain equipment and rolling stock specified. [May 12, '17.]

Rhode Island Company, Providence, R. I.—This company plans to construct double track on Chalkstone Avenue from Smith Street to Lisbon Street.

Austin (Tex.) Street Railway.—Work will soon be begun by the Austin Street Railway on the construction of an extension to Travis Heights. It is expected that the line will be in operation by Aug. 15.

Willapa Electric Company, Raymond, Wash.—The City Council of South Bend has notified the Willapa Electric Company that it must pave between its tracks on Upper Water Street. Three years ago the Council permitted the company to plant between the rails on its plea that the street grade had not settled enough to make it possible to put in paving which would stand wear.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—The extension of a double-track street car line to the site of the American Lake (Wash.) Cantonment near Tacoma, is receiving consideration by officials of the Stone & Webster interests in Tacoma and Seattle. A conference was held recently between W. A. McGrath, vice-president of the Puget Sound Traction, Light & Power Company, and other officials of the company and Major Stone, Capt. H. M. Smitten, chief assistant, and his advisers. The government favors the extension of car service between Tacoma and the new cantonment at the earliest possible date. Tremendous problems of transportation for the thousands who will want to reach Tacoma from the post would be greatly simplified by a street car service. The Pacific Highway, while providing a present good means of connection, will become congested with hundreds of automobile buses and the great number of automobile trucks and delivery machines connected with the business of the post. Traction officials agreed at the conference to take the matter of the extension of its lines under immediate advisement and reach conclusions as soon as possible. Should the company conclude to construct double-track extensions, it will mean the expenditure of several hundred thousand dollars.

Tacoma (Wash.) Municipal Railway.—An ordinance was recently introduced in the City Council authorizing the issuance of $180,000 of city utility bonds to provide funds to build and equip the proposed municipal line to the Todd shipyards on the tideflats. The line may be single or double track. C. D. Atkins, commissioner of public works, is placed in charge of construction.

SHOPS AND BUILDINGS

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—Plans are being made by the Chicago, North Shore & Milwaukee Railroad for the construction of a new station at Great Lakes.

Kansas City, Mo.—Mayor Edwards of Kansas City has vetoed the ordinance locating the proposed union station for the use of interurban railways at the northeast corner of McGee and Tenth Streets.

Philadelphia, Pa.—Sealed proposals will be received by the Department of City Transit, Philadelphia, Pa., William S. Twining, director, until 12 o'clock noon, on July 10 for the construction of five stations along the line of the Frankford elevated railway. Copies of plans and specifications may be obtained upon deposit of $10, to be refunded upon return of plans.

Texas Electric Railway, Dallas, Tex.—This company will erect a $50,000 to $100,000 union interurban express terminal for the Electric Express Company.

POWER HOUSES AND SUBSTATIONS

Pacific Gas & Electric Company, Sacramento, Cal.—An additional power house will be erected by the Pacific Gas & Electric Company about 600 ft. below the Spaulding Dam, where 5000 hp. will be generated under a 173-ft. head of water. The proposed plant will cost about $125,000.

Manhattan City & Interurban Railway, Manhattan, Kan.—This company reports that it expects to purchase a new or second-hand 200 or 300 kw. rotary converter.

Atlantic Coast Electric Railway, Asbury Park, N. J.—A report from this company states that it is installing four Badenhausen water tube boilers of 610 hp. each, in two batteries, one-half of which will be completed about July 15.

Marion Railway, Light & Power Company, Marion, Ohio.—Extensive improvements are being made to the power plant of this company. They include the installation of a Heine steam boiler, large steam turbine, surface condenser, air pump, circulating pump, etc. A new cooling system will replace the old pipe spray system. The cost of the system is estimated at $37,000.

Manufactures and Markets

Discussions of Market and Trade Conditions for the Manufacturer, Salesman and Purchasing Agent

Rolling Stock Purchases Market Quotations Business Announcements

Settling for Defective Equipment

Neither Party Should Suffer Unduly—Unreasonable Requests Stifle Development—A 50-50 Case Is Cited—Consequential Damages Paid

Manufacturing companies are very jealous of their reputations in the fields which they serve, and for that reason examples are rare of their failure to make good any and all requirements of recognized specifications. But once in a while it falls to the operating engineer to put in a claim against a manufacturer on account of the failure, for a time at least, of certain equipment to give satisfactory service. No general rule can be laid down as to the proper procedure in such cases, for the terms of the contract naturally govern the negotiations in a broad sense. On some occasions it has been found necessary to remove the equipment before acceptance was possible, and in this event the main point is to see to it that the purchaser does not suffer unduly for the trial. Yet the railway company naturally wishes to be entirely fair to the manufacturer, particularly if he puts forth strong efforts to remedy the defects encountered in service.

Most every engineer appreciates the amount of money and effort that the manufacturers of electrical and steam machinery have at times been called upon to spend to make good on guaranteed performances. Certainly the spirit of the manufacturers to fulfill contracts is well known, yet one hears frequently of cases in which the evidence would seem to indicate that some customers have attempted to saddle on to the manufacturers charges that should have been classed as maintenance expense. Not infrequently the manufacturers are asked to make good damaged apparatus that has been in service for a year or more longer than the guarantee period. Sometimes they do it, then charge it to good policy, to competition, or to the sales expense of the next order.

ADJUSTING DIFFERENCES BETWEEN MANUFACTURER AND PURCHASER

The adjustment of differences arising from the interpretation of specifications is always a difficult task and sometimes requires an arbitrator. The time to avoid these differences is, of course, when the contract and specifications are being drawn. At that time the policy of the seller should be definitely expressed regarding the possible payment of damages for loss to the purchaser occasioned by failure of the manufacturer to make delivery on time or the failure of the apparatus to show on test the degree of efficiency called for in the contract.

Since the producers have been so busy lately, it is noted that more companies than heretofore refuse to accept liability for consequential damages, particularly where these are in the form of damages for delayed deliveries.

In discussing this subject of the adjustments effected between buyers and sellers, it should be remembered that upon the spirit of fairness displayed by the buyers will largely depend the willingness of the manufacturer to continue to spend great sums for the development of new apparatus. Still another element to be considered is the fact that the manufacturers have been asked by railway executives to make good so-called defective apparatus which has been damaged through carelessness of the operating staff. And, too, the purchase of standardized products places upon the manufacturer a greater responsibility for making good all defects than would seem to rest upon him when the purchaser has insisted on changes being introduced into the design.

All of these elements are generally recognized, but the citation of one case may be informative. In this instance many months elapsed before a generating unit could be utilized satisfactorily in regular service; so the purchaser's engineer estimated the increased fuel consumption for the period in which the company was obliged to use machines of lower efficiency, and a compromise was made on a "50-50" basis. This brought the owner of the unit nearly $20,000. There was no doubt that the purchaser burned the extra coal, and of course the work of his staff was somewhat increased by the tests and experiments necessary to put the unit in first-class condition. Probably the payroll was not increased seriously, and the compromise solution doubtless was fair to both parties.

Where such estimates are prepared to show the cost to the purchaser of being deprived of a given service for a considerable period, it is desirable that the computations be preserved in a form which will permit easy checking by an arbitrator. The rule of reason should not be forsaken in cases involving the installation of equipment with which the maker, in good faith, is endeavoring to live up to specifications; and petty claims for inconvenience or trifling losses are not worth their trouble. There is a middle ground between sharp practice and easy-going tolerance of real and substantial losses, which can be traversed in most cases with mutual respect and satisfactory relations between the parties concerned.

Fare Register Production Cost Increases

Comparisons Are Made Showing Changes Since Last Year—Wage Scale Shows 40 Per Cent Increase in Three Years

Some of the difficulties with which the manufacturer of fare registers has had to contend during the last three years were set forth in an interview with John F. Ohmer, president of the Ohmer Fare Register Company, Dayton, Ohio, and published in this department of the ELECTRIC RAILWAY JOURNAL for Dec. 9, 1916. At that time it was noted how the abnormally high material prices had enforced conditions upon the manufacturers which had been hard to meet. Attention was called to the increasing difficulties of the paper supply situation, and some interesting facts were given regarding the purchase and preparation of paper rolls suitable for use in recording fare registers.

Mr. Ohmer states that since his earlier interview there have been notable changes in the prices of many of the essentials in fare register manufacture. Some of these are of particular interest. For example, by comparison with the conditions of last October, manufacturing steel has advanced about 15 per cent, brass and aluminum have remained normal, gray-iron castings have advanced 10 per cent, high-speed tool steel has decreased about 20 per cent, and general supplies have advanced an average of from 15 to 20 per cent, while register paper, a most important item, has advanced 48 per cent. The high price of fuel has been sustained, and the indications are that the price will go still higher.

WAGES STILL SKYROCKETING

Because of the proportionately large number of expert mechanics required, the labor cost for fare register manufacture is relatively high, and the great increases of the last few years have brought about conditions heretofore never contemplated. With regard to present wages and the possible future conditions, Mr. Ohmer may be quoted as follows: "A careful analysis of our records shows that our average wage scale in December, 1916, had increased 22.4 per cent over the average wage scale of 1914. Our wage schedule for May, 1917, shows an average increase for 312 men of 14.6 per cent over the month of December, 1916, and, as compared with the month of May, 1914, our wage schedule for May, 1917, shows an increase of more than 40 per cent. A large majority of our employees are high-grade machinists and tool makers, and our average is perhaps above the general average.

"Since the declaration of war against Germany, followed by uncertainties as to the result of pending legislation which may seriously affect material and labor, there seems to be a tendency to economize along many lines of industry, and until the large appropriations made by our government begin to circulate freely in payment for materials and equipment, we must expect some considerable depression in business."

Standardizing Trade Literature

In connection with the standardization of trade literature, on which a number of articles and comments have appeared recently in these columns, a committee appointed by the Associated Manufacturers of Electrical Supplies has recommended that the dimensions 8 in. x 10½ in. be adopted as standard for catalogs, letter paper, contract forms, bulletins, specifications and engineering forms for the following reasons:

A large portion of the manufacturers would be glad to adopt any standard dimensions recommended by the committee.

The 8-in. x 10½-in. sheet has approximately 10 per cent less paper than the 8½-in. x 11-in. One manufacturer estimates that this item alone will save his company $12,000 a year, and all manufacturers are vitally interested in a saving of this nature.

Our investigations indicate that these dimensions have been adopted as the United States government standard.

As a rule photographs of electrical apparatus are made on 8-in. x 10-in. plates and the finished prints can be easily trimmed to 8-in. x 10½-in.

The American Institute of Architects has recommended the size of 8 in. x 10½ in. for all catalogs of building material. A thin catalog of this size when folded once will fit readily the average pocket, whereas a 6-in. x 9-in. catalog when not folded will not fit in the pocket.

The Electrical Supply Jobbers' Association has adopted as the standard for its loose-leaf catalog a page 8 in. x 10½ in.

This size of sheet for letter paper, catalogs, etc., will file much more readily in standard letter files than will the larger size.

In addition to the actual saving in paper mentioned, there would be an additional saving in envelops and a very great saving in postage, due to reduced shipping weight of catalogs. The question of postage will probably become a very serious matter of expense to the manufacturer in the near future and should receive careful consideration.

Increase in Coal and Coke Shipments for May

The number of carloads of bituminous coal originating on eighty-two railroads during the month of May, 1917, as compiled from a report received by the Geological Survey, Department of the Interior, was 739,674 as compared with 657,809 in April of 1917 and with 597,517 for May of 1916. Shipments originating on eleven roads in central Pennsylvania, Maryland and the New River and Pocahontas fields of West Virginia and Virginia amounted to 186,249 carloads, which was the largest amount from any of the seven districts included in the report. The increase in the shipments of bituminous coal in May, 1917, compared with April, 1917, was 12.4 per cent, and compared with May, 1916, it was 23.8 per cent. The daily average of cars loaded in May, 1917, was 28,429 as compared with 26,312 in April, 1917, and 22,981 in May, 1916.

Carloads of beehive coke originating on sixteen roads during the month of May, 1917, amounted to 75,528 as compared with 72,222 for April, 1917, and 76,096 for May, 1916. The May shipments of 1916 showed an increase of 4.6 per cent over April, 1917, and a decrease of 0.75 per cent as compared with May, 1916.

War Demand for Lumber Will Not Disturb Market

Enormous Amount Needed for Army Purposes Is Only Small Per Cent of Annual Production

The lumber committee of the advisory commission, Council of National Defense, has estimated that 2,000,000,000 ft. of lumber will be used in the next twelve months for purposes directly connected with the war. While this is a colossal order and will bring added prosperity to the lumber industry, it should give no apprehension that it will disturb the markets or cause any shortage of lumber. Large as this amount is, it will not exceed 5 per cent of one year's lumber production in the United States.

The committee representing the Southern Pine Association recently announced that Gen. George W. Goethals had placed an order for lumber for 100 ships, to be sawed by the Southern mills at an average price of $35 per thousand feet at the mills. Approximately 140,000,000 ft. of lumber will be required for these 100 ships.

New Westinghouse Vice-Presidents

As noted briefly in last week's issue, H. D. Shute, H. T. Herr and Walter Cary have been elected vice-presidents of the Westinghouse Electric & Manufacturing Company. Mr. Shute was graduated from Massachusetts Institute of Technology with the class of 1892. He became associated with the Westinghouse company the following year, and after spending two years in the testing department became associated with L. B. Stillwell. After some time spent on construction and design work he entered the sales department, in which he remained until 1903, when he was made assistant to Vice-President L. A. Osborne. He filled this position for about seven years, when he was elected acting vice-president. In 1914 he was made treasurer of the company, succeeding T. W. Siemon.

Herbert Thacker Herr has been connected with the Westinghouse Machine Company since 1908, holding respectively the positions of general manager, second vice-president and finally vice-president and general manager. He received his education in the public schools in Denver and at Yale University. After leaving college he became identified with a number of railroads, serving in various capacities, and in 1906 was made general superintendent of the Denver & Rio Grande Railroad. Two years later he became vice-president and general manager of the Duquesne Mining & Reduction Company, which position he held until he moved to Pittsburgh.

Walter Cary has, since 1904, been associated with the Westinghouse Lamp Company, filling for the greater part of the time the position of vice-president and general manager. He received his education in the city schools of Milwaukee and at Harvard University. Later he became secretary of the Gibbs Electric Company of Milwaukee, and in 1899 with other local men formed the Milwaukee Electric Company, becoming its vice-president and, in 1902, president.

Railroads' War Board Helps to Reduce Car Shortage

The shortage of freight cars in the United States was reduced during the month of May from 148,627 to 105,127 cars, almost 33⅓ per cent. This marked reduction in one month, following four months of rapid increase, is attributed to the prompt response on the part of both shippers and railroads to the specific suggestions which have been made by the railroads' war board as to how to secure more effective uses of existing freight equipment. Some of those suggestions are: Load cars 10 per cent in excess of marked capacity; reduce percentage of cars and locomotives under repairs; improve methods of firing locomotives; defer scrapping light locomotives; speed up handling of cars in terminals by prompt despatch of trains; load and unload promptly, and enlist co-operation of shippers, as a war measure, to secure heavier loading of cars.

The progressive improvement in the situation is indicated by the fact that on March 1 reports made by railroads to the American Railway Association showed a shortage in the entire country of 130,082 freight cars. The shortage grew to 144,797 by April 1, and on May 1, when the railroads' war board was just starting to operate all the railroads as a continental system with the aim of producing a maximum national transportation efficiency, the shortage had reached 148,627 freight cars.

NEW YORK METAL MARKET PRICES

	June 16	June 28
Prime Lake, cents per lb	32½	32½
Electrolytic, cents per lb	32½	32½
Copper wire base, cents per lb	36	36
Lead, cents per lb	11⅞	11¾
Nickel, cents per lb	50	50
Spelter, cents per lb	9¾	9⅜
Tin, Straits, cents per lb	60⅝	62
Aluminum, 98 to 99 per cent, cents per lb	61	61

OLD METAL PRICES

	June 16	June 28
Heavy copper, cents per lb	28	28½
Light copper, cents per lb	25½	25½
Red brass, cents per lb	17½	17½
Yellow brass, cents per lb	18	18
Lead, heavy, cents per lb	8¾	8¾
Zinc, cents per lb	7	7¼
Steel car axles, Chicago, per net ton	$48.00	$53.00
Old car wheels, Chicago, per gross ton	$36.00	$43.00
Steel rail (scrap), Chicago, per gross ton	$39.50	$48.50
Steel rail (relaying), Chicago, per gross ton	$42.50	$53.50
Machine shop turnings, Chicago, per net ton	$18.00	$20.00

CURRENT PRICES FOR MATERIALS

	June 16	June 28
Rubber-covered wire base, New York, cents per lb.	36½	36½
No. 0000 feeder cable (bare), New York, cents per lb.	36½	36½
No. 0000 feeder cable stranded, New York, cents per lb.	33¾	33¾
No. 6 copper wire (insulated), New York, cents per lb.	33	33
No. 6 copper wire (bare), New York, cents per lb.	36	36
Rails, heavy, O. H., Pittsburgh, per gross ton	$40.00	$40.00
Wire nails, Pittsburgh, per 100 lb	$3.50	$3.20
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$4.00	$4.50
Steel bars, Pittsburgh, per 100 lb	$4.40	$4.50
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$7.35	$7.90
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$9.05	$9.30
I-beams over 15 in., Pittsburgh, cents per lb	10	10
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.85
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$4.15	$4.85
Cement (carload lots), New York, per bbl	$2.40	$2.40
Cement (carload lots), Chicago, per bbl	$2.31	$2.31
Cement (carload lots), Seattle, per bbl	$2.60	$2.60
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.21	$1.18
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.22	$1.19
White lead (100 lb. keg), New York, cents per lb.	12¼	12¾
Turpentine (bbl. lots), New York, cents per gal.	44	43

ROLLING STOCK

Mason City & Clear Lake Railroad, Mason City, Ia., has purchased five one-man safety cars.

Kankakee & Urbana Traction Company, Kankakee, Ill., is in the market for a standard trail car.

Birmingham Railway, Light & Power Company, Birmingham, Ala., noted in the May 5 issue as purchasing twelve double-end, closed motor cars through the United Gas & Electric Corporation, has specified the following details for this equipment:

Number of cars ordered	12
Date of order	April 27, 1917
Date of delivery	Oct. 1, 1917
Builder	J. G. Brill
Type	Closed motor
Over bumpers	47 ft. 8 in.
Over corner posts	34 ft. 8 in.
Over all	8 ft. 7 in.
Rail to trolley base	11 ft. 1 in.
Body	Semi-steel
Interior trim	Cherry
Headlining	¼-in. Nevasplit
Roof	Arch
Air brakes	Westinghouse
Axles	Hammered steel
Bumpers	Rico anti-climbers
Car trimmings	Bronze
Control	Westinghouse
Curtain fixtures	Forsythe No. 88
Curtain material	Pantasote No. 86
Designation signs	Keystone, Ill.
Door mechanism	Burdette Rowntree
Fenders	H. B. lifeguards
Gongs	12-in. Brill Dedenda
Heaters	Consolidated Car Heating
Headlights	Crouse-Hinds
Journal boxes	Brill
Lightning arresters	not placed
Motors	Four West. 506-A-2
Registers	International
Sanders	not placed
Sash fixtures	O. M. Edwards
Seats	Hale & Kilburn No. 300-A
Seating material	Cherry wood
Step treads	Amer. Abrasive Co.
Trolley catchers	Earle No. 7
Trucks	Brill 77-E-1
Ventilators	Railway Utility Co.
Wheels	So. W. Co. 26-in. cast iron
Special devices	Consolidated buzzer system, Ellcon stanchions, Railway Utility thermostats, Brill center and side bearings, Brill graduated spring system and Brill bolster guide arrangement.

Manhattan City & Interurban Railway, Manhattan, Kan., is in the market for several large double-truck double-end motor cars and several large trailers.

Knoxville Railway & Light Company, Knoxville, Tenn., noted in the May 5 issue as having had twelve double-end closed motor cars purchased for it through the United Gas & Electric Corporation, has specified the following details for these cars:

Number of cars ordered	12
Date of order	April 27, 1917
Date of delivery	Oct. 1, 1917
Builder	J. G. Brill
Type	Closed motor
Seating capacity	52
Over bumpers	47 ft. 8 in.
Over corner posts	34 ft. 8 in.
Over all	8 ft. 7 in.
Rail to trolley base	11 ft. 1 in.
Body	Semi-steel
Interior trim	Cherry
Headlining	¼ in. Nevasplit
Roof	Arch
Air brakes	West.
Axles	Hammered steel
Bumpers	Rico anti-climbers
Car trimmings	Bronze
Control	West.
Curtain fixtures	Forsythe No. 88
Curtain material	Pantasote No. 86
Designation signs	Keystone, Ill.
Door mechanism	Burdette Rowntree
Wheelguards	H. B. lifeguards
Gongs	12 in. Brill Dedenda
Heaters	Consolidated Car Heating
Headlights	Crouse-Hinds
Journal boxes	Brill
Lightning arresters	not placed
Motors	Four West. 506-A-2
Registers	International
Sanders	not placed
Sash fixtures	O. M. Edwards
Seats	Hale & Kilburn No. 300-A
Seating material	Cherry wood
Step treads	Amer. Abrasive Co.
Trolley catchers	Earle No. 7
Trucks	Brill 77-E-1
Ventilators	Railway Utility Co.
Wheels	So. W. Co. 26-in. cast iron
Special devices	Consolidated buzzer system, Ellcon stanchions, Railway Utility thermostats, Brill center and side bearings, Brill graduated spring system and Brill bolster guade arrangement.

Northern Ohio Traction & Light Company, Akron, Ohio, has specified the following details for ten 33-ft. vestibuled single-end pay-within cars and for ten center-entrance trailers being built for it by the St. Louis Car Company.

	Single-End Pay-Within Cars	Center-Entrance Trailers
Number	10	Number 10
Name	N. O. T. & L.	N. O. T. & L.
Builder	St. Louis Car	St. Louis Car.
Type	Single-end	Center entrance.
Seating capacity	48	66.
Weight (total)	43,000 lb.	25,000 lb.
Truck centers, length	19 ft. 6 in	28 ft. 0 in.
Length over bumpers	46 ft. 4 in	46 ft. 8¾ in.
Length over corner-posts	33 ft. 0 in.	
Length over vestibule	45 ft. 4 in.	
Width over posts	8 ft. 5½ in.	8 ft. 2 in.
Sill to trolley base	8 ft. 5½ in.	8 ft. 11⅝ in.
Floor to ceiling	7 ft. 6 in.	
Body	Steel	Steel underframe.
Interior trim	Solid mahogany	Solid mahogany.
Head lining	3/16 in. agasote	3/16 in. agasote.
Roof	Turtle deck	Monitor.
Air brakes	Westinghouse	Westinghouse.
Axles		Forged open hearth.
Bumpers	Rico anti-climbers	Rico anti-climbers.
Car trimmings	Bronze	Bronze.
Conduits and junction boxes	St. Louis Car	St. Louis Car.
Control, type	GE. K-34	
Couplers	Tomlinson	Tomlinson.
Curtain fixtures	Forsyth No. 88	Forsyth No. 88.
Curtain material	Pantasote N-3	Pantasote.
Designation signs	Ill.—St. Louis Car	E. S. S. Co.
Door mechanism	Hand operated	Natl. Pneumatic.
Hand brakes	Ry. company's design	Ackley.
Heaters	Peter Smith No. 2-P	Peter Smith No. 2-P.
Headlights	Crouse-Hinds.	
Hand straps	Rico sanitary	
Journal boxes		St. Louis Car.
Motors	Four GE. 203 outside hung	
Paint	Murphy ABC	Murphy ABC.
Registers	International R-S.	
Sand box with Reliance	Sand trap valve	
Sash fixtures	O. M. Edwards	O. M. Edwards.
Seats	Hale & Kilburn	Hale & Kilburn.
Seating material	Rattan	Rattan
Springs	Pittsburgh Steel Spring Co.	Pittsburgh Steel Spring.
Step treads	Mason safety tread	Mason.
Trucks	Standard 0-50-0	St. Louis Car 118
Ventilators	Automatic	Deck Sash.
Wheels	33 in. Cast Iron	Cast iron 22 in. diam.
Special devices, etc.	Faraday buzzers, Perry side bearings, Ohio Brass Signals.	Faraday buzzers, Perry side bearings, rear end signals, Ohio Brass.

TRADE NOTES

Carbo Steel Post Company, Chicago, Ill., has moved its offices to 4-5 Transportation Building.

Hess-Bright Manufacturing Company, Philadelphia, Pa.: A bulletin on "Hess-Bright Ball Bearings," and how to apply them.

M. M. Moore, formerly with the machine tool department of Gaston, Williams & Wigmore, Inc., New York, has severed his connection with that firm and is now associated with the sales department of John W. Thorne & Company, Inc., 165 Broadway.

Cooper-Hewitt Electric Company, Philadelphia, Pa., has moved its offices from 124 South Eighth Street to the Drexel Building.

Standard Varnish Works, New York, N. Y., announces that its advertising department is now located at the main office, 90 West Street, New York City, and that in the future all matter pertaining to advertising should be directed to this new address.

Karl W. Bock, who for the last ten years has been secretary of and assistant to the vice-president of the Union Pacific Coal Company, Omaha, Neb., has been appointed manager of the Walter A. Zelnicker Supply Company, St. Louis, Mo.

Templeton-Kenly & Company, Ltd., Chicago, Ill., report that the recently improved flexible-type jack has broadened the jack market in the electric railway industry. Formerly the rigid-base jacks were purchased for use by the track and car-shop departments only. Now, with the development of the flexible-base jack, the line department has found many uses for them, and they are carried on trouble wagons. In consequence the sales to electric railway companies have been on the increase. Templeton-Kenly & Company report, for example, for their special pole-handling jack that large numbers have been sold to the American Telephone & Telegraph Company, that the Commonwealth Edison Company of Chicago has purchased more than 100, and that large shipments have been made to the Australian government telegraph system, to the Danish government telephone system, to practically all the public service properties in Hawaii, to the Connecticut Company and to the Public Service Company of New Jersey. The Illinois Traction System has also recently ordered these jacks for use on its line cars. The quality of materials used in jack manufacture is now high, and therefore the jack of to-day may be expected to do better duty and withstand more severe service than those manufactured some years ago.

NEW ADVERTISING LITERATURE

U. S. Electrical Manufacturing Company, Los Angeles, Cal.: A pamphlet on the Johnson electric grinding and buffing tool for machine shop and all-around general use.

Ohmer Fare Registering Company, Dayton, Ohio: A bulletin, "Getting Your Money," explaining methods of protecting your income and its source by the Ohmer system of fare protection.

Laclede-Christy Clay Products Company, St. Louis, Mo.: A pamphlet "All in the Same Boat." This is an appeal to all users of refractory materials to anticipate their orders six months in advance in order to insure deliveries.

Sprague Electric Works of the General Electric Company, New York, N. Y.: Bulletin 48700A on monorail hoists. Gives descriptions, illustrations and other data on the use of monorail hoists in shops, foundries and manufacturing plants.

Guaranty Trust Company, New York, N. Y.: A bulletin on "The Financing of American Foreign Trade," explanatory of the facilities offered to American and foreign banking institutions and to importers and exporters by the foreign department of the company.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Bulletin No. 7193 on "Westinghouse Electrical Equipment for Ventilating Service." Types of motors and controllers adapted for this service are described and the amount of power required to drive different types of fans and blowers is also given.

Chicago Pneumatic Tool Company, Chicago, Ill.: Bulletin 34-Y on "Gas and Gasoline-Driven Air Compressors," descriptive of its class N-SG and N-SGL compressors. Longitudinal sections showing details of the construction and several pages of data on general dimensions for the different sizes of compressors are given.

Delta-Star Electric Company, Chicago, Ill.: Bulletin No. 81. Forty-eight pages on "High-Tension Indoor Universal 'Unit Type' Busbar Supports." Illustrates a number of installations of busbar and wiring supports, I-beam busbar supports, different types and mountings in modern compartments, dimensions of various types of busbar supports, combination switch and fuse, selective switches and unit type outdoor equipment.

Prest-O-Lite Company, Inc., Indianapolis, Ind.: A pamphlet "Prest-O-Lite Process," and apparatus for oxy-acetylene welding and cutting. Gives details of portable welding equipment, also details of parts. Contains useful data on costs, cutting results, oxygen and acetylene consumption per hour for different sizes of tips, etc.

Stroh Steel Hardening Process Company, Pittsburgh, Pa.: An attractive twenty-four-page bulletin on the Stroh process, which consists of casting fine alloy steel and soft steel in one solid piece. This process is used for hardening gears and pinions, mine car wheels, frogs, crossings and inserts, and many types of large castings.

Dunn Wire-Cut Lug Brick Company, Conneaut, Ohio: A thirty-two-page bulletin, "Modern Methods of Brick Pavement Construction," for roads and streets built with wire-cut lug brick. Contains a brief review of the early history and of the evolution of the brick paving industry, a description of this company's standard brick and how it is laid, also its process of manufacture, engineering service rendered, and new paving methods now being employed. It also includes a number of testimonial letters from engineers, contractors and electric railway companies, including the Ohio Electric Railway, the Lake Shore Electric Railway, Buffalo & Lake Erie Traction Company and others.

New Publications

Railway Statistics of the United States of America.—1916. Prepared by Slason Thompson. Bureau of Railway News & Statistics, Chicago, Ill. 148 pages. Paper.

The present issue of this publication, now in its thirteenth year, is for the year ended June 30, 1916. Statistics for steam railroad operation during this period are compared with the official reports for 1915. The pamphlet also contains recent statistics of foreign steam railroads.

Business Finance. By William H. Lough. Ronald Press Company, New York, N. Y. 631 pages. Cloth, $3.

Written from the point of view of the organizer or financial manager of an enterprise, this book deals with the every-day financial problems of the private business concern. Forms of business organization and of security issues, raising capital, handling capital and remedying mismanagement and irregularities—all these are clearly and thoroughly explained. The information given should be of value to him who manages corporate finances or him who criticises their management. Many examples cited in the book are from the utility field, which should amply indicate its applicability to utility finance.

Some Legal Phases of Corporate Financing, Reorganization and Regulation. By Stetson, Byrne, etc. The Macmillan Company, 66 Fifth Avenue, New York, N. Y. 389 pages. Cloth, $2.75.

This book consists of a series of interesting addresses delivered in 1916 before the Bar Association of New York City. Such topics are covered as the preparation of corporate instrument, foreclosure of mortgages, reorganization, federal business laws and public service commissions. While the lectures were intended to aid lawyers who might be engaged in corporate practice in some way, they ought also to be of interest to the utility official who wants to have a general knowledge of corporation finance and law.

Units of Weight and Measure: Definitions and Tables of Equivalents. Bureau of Standards. Technologic Paper No. 47. Government Printing Office, Washington, D. C. Sixty-eight pages. Paper, 15 cents.

This paper is intended to supply the need for various authoritative tables of weights and measures for converting the United States customary units into metric units, and vice versa. It contains sixty-eight pages of definitions and translation tables, and gives official definitions of the units and definite statements as to the spelling and abbreviations of the various units of measurement. Since the use of the metric system in foreign trade is necessary either in catalogs and price lists, in the making up of metric packages, or in working the metric dimensions, the circular will be found especially timely. A copy should be in the hands of every one engaged in foreign trade, scientific or technical work, etc.

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